2.—*North wing of the Capitol.*

Expended on the north wing of the capitol, prior to 1803, including the foundations of the south wing and centre,	$337,735 38	
From this sum deduct the full value of the above foundations,	30,000 00	
		307,735 38
Expended in 1803,		3,301 75
Expended in 1807,		24,840 50
Total cost of the north wing,		$335,877 63

All which is most respectfully submitted, by your faithful humble servant,

B. HENRY LATROBE,
Surveyor of the public buildings of the United States.

To the PRESIDENT OF THE UNITED STATES.

10th CONGRESS.] No. 250. [1st SESSION.

ROADS AND CANALS.

COMMUNICATED TO THE SENATE, APRIL 6, 1808.

SIR: TREASURY DEPARTMENT, *April* 4, 1808.

I have the honor to transmit a report respecting roads and canals, prepared in obedience to the resolution of the Senate of the 2d of March, 1807. It has been unavoidably delayed much later than was desirable, or had been expected. Although early steps had been taken for obtaining the necessary information, the most important documents were not received till long after the commencement of the session, some, indeed, within the last ten days. To analyze the whole, to select, arrange, and condense, the most interesting facts, was also a work of some labor. Time has not permitted to present the report in a more satisfactory form; but the mass of facts which has been collected will, it is hoped, be of some public utility.

I have the honor to be, with great respect, sir, your most obedient servant,

ALBERT GALLATIN.

Hon. GEORGE CLINTON, *President of the Senate.*

The SECRETARY OF THE TREASURY, in obedience to the resolution of the Senate of the 2d March, 1807, respectfully submits the following report on roads and canals:

The general utility of artificial roads and canals is at this time so universally admitted, as hardly to require any additional proofs. It is sufficiently evident that, whenever the annual expense of transportation on a certain route, in its natural state, exceeds the interest on the capital employed in improving the communication, and the annual expense of transportation (exclusively of the tolls,) by the improved route, the difference is an annual additional income to the nation. Nor does in that case the general result vary, although the tolls may not have been fixed at a rate sufficient to pay to the undertakers the interest on the capital laid out. They, indeed, when that happens, lose; but the community is nevertheless benefited by the undertaking. The general gain is not confined to the difference between the expense of the transportation of those articles which had been formerly conveyed by that route, but many which were brought to market by other channels will then find a new and more advantageous direction; and those which on account of their distance or weight could not be transported in any manner whatever, will acquire a value, and become a clear addition to the national wealth. Those and many other advantages have become so obvious, that in countries possessed of a large capital, where property is sufficiently secure to induce individuals to lay out that capital on permanent undertakings, and where a compact population creates an extensive commercial intercourse, within short distances, those improvements may often, in ordinary cases, be left to individual exertion, without any direct aid from Government.

There are, however, some circumstances, which, whilst they render the facility of communications throughout the United States an object of primary importance, naturally check the application of private capital and enterprise to improvements on a large scale.

The price of labor is not considered as a formidable obstacle, because whatever it may be, it equally affects the expense of transportation, which is saved by the improvement, and that of effecting the improvement itself. The want of practical knowledge is no longer felt; and the occasional influence of mistaken local interests, in sometimes thwarting or giving an improper direction to public improvements, arises from the nature of man, and is common to all countries. The great demand for capital in the United States, and the extent of territory compared with the population, are, it is believed, the true causes which prevent new undertakings, and render those already accomplished less profitable than had been expected.

1. Notwithstanding the great increase of capital during the last fifteen years, the objects for which it is required continue to be more numerous, and its application is generally more profitable than in Europe. A small portion therefore is applied to objects which offer only the prospect of remote and moderate profit. And it also happens that a less sum being subscribed at first than is actually requisite for completing the work, this proceeds slowly; the capital applied remains unproductive for a much longer time than was necessary, and the interest accruing during that period becomes, in fact, an injurious addition to the real expense of the undertaking.

2. The present population of the United States, compared with the extent of territory over which it is spread, does not, except in the vicinity of the seaports, admit that extensive commercial intercourse within short distances,

which, in England and some other countries, forms the principal support of artificial roads and canals. With a few exceptions, canals particularly cannot, in America, be undertaken with a view solely to the intercourse between the two extremes of, and along the intermediate ground which they occupy. It is necessary, in order to be productive, that the canal should open a communication with a natural extensive navigation which will flow though that new channel. It follows that whenever that navigation requires to be improved, or when it might at some distance be connected by another canal to another navigation, the first canal will remain comparatively unproductive until the other improvements are effected, until the other canal is also completed. Thus the intended canal between the Chesapeake and Delaware, will be deprived of the additional benefit arising from the intercourse between New York and the Chesapeake, until an inland navigation shall have been opened between the Delaware and New York. Thus the expensive canals completed around the falls of Potomac will become more and more productive in proportion to the improvement, first, of the navigation of the upper branches of the river, and then of its communication with the Western waters. Some works already executed are unprofitable; many more remain unattempted, because their ultimate productiveness depends on other improvements, too extensive or too distant to be embraced by the same individuals.

The General Government can alone remove these obstacles.

With resources amply sufficient for the completion of every practicable improvement, it will always supply the capital wanted for any work which it may undertake, as fast as the work itself can progress; avoiding thereby the ruinous loss of interest on a dormant capital, and reducing the real expense to its lowest rate.

With these resources, and embracing the whole Union, it will complete on any given line all the improvements, however distant, which may be necessary to render the whole productive, and eminently beneficial.

The early and efficient aid of the *Federal* Government is recommended by still more important considerations. The inconveniences, complaints, and perhaps dangers, which may result from a vast extent of territory, can no otherwise be radically removed or prevented than by opening speedy and easy communications through all its parts. Good roads and canals will shorten distances, facilitate commercial and personal intercourse, and unite, by a still more intimate community of interests, the most remote quarters of the United States. No other single operation, within the power of Government, can more effectually tend to strengthen and perpetuate that Union which secures external independence, domestic peace, and internal liberty.

With that view of the subject the facts respecting canals, which have been collected in pursuance of the resolution of the Senate, have been arranged under the following heads:

1. Great canals, from north to south, along the Atlantic seacoast.
2. Communications between the Atlantic and Western waters.
3. Communications between the Atlantic waters, and those of the great lakes, and river St. Lawrence.
4. Interior canals.

GREAT CANALS ALONG THE ATLANTIC SEACOAST.

The map of the United States will show that they possess a tide water inland navigation, secure from storms and enemies; and which, from Massachusetts to the southern extremity of Georgia, is principally, if not solely, interrupted by four necks of land. These are, the isthmus of Barnstable; that part of New Jersey which extends from the Raritan to the Delaware; the peninsula between the Delaware and the Chesapeake; and that low and marshy tract which divides the Chesapeake from Albemarle sound. It is ascertained that a navigation for sea vessels, drawing eight feet of water, may be effected across the three last; and a canal is also believed to be practicable, not, perhaps, across the isthmus of Barnstable, but from the harbor of Boston to that of Rhode Island. The Massachusetts canal would be about twenty-six, the New Jersey about twenty-eight, and each of the two southern about twenty-two miles in length, making altogether less than one hundred miles.

Should this great work, the expense of which, as will hereafter be shown, is estimated at about three millions of dollars, be accomplished, a sea vessel entering the first canal in the harbor of Boston would, through the bay of Rhode Island, Long Island sound, and the harbor of New York, reach Brunswick on the Raritan; thence pass through the second canal to Trenton on the Delaware, down that river to Christiana or Newcastle, and through the third canal to Elk river and the Chesapeake; whence, sailing down that bay and up Elizabeth river, it would, through the fourth canal, enter the Albemarle sound, and by Pamlico, Core, and Bogue sounds, reach Beaufort and Swansborough in North Carolina. From the last mentioned place, the inland navigation, through Stumpy and Toomer's sounds, is continued with a diminished draught of water, and by cutting two low and narrow necks, not exceeding three miles together, to Cape Fear river; and thence by an open but short and direct run along the coast is reached that chain of islands between which and the main the inland navigation is continued to St Mary's along the coast of South Carolina and Georgia. It is unnecessary to add any comments on the utility of the work, in peace or war, for the transportation of merchandise, or the conveyance of persons.

The several papers under the letter A, herewith transmitted, contain the information which has been received on those several intended communications. The substance will now be stated.

I. Massachusetts Canal.

1. Sandwich isthmus between Barnstable bay on the north, and Buzzard's bay on the south, had first attracted the public attention. Surveys and levels were taken, for the purpose of ascertaining the practicability of opening a cross cut to be supplied by the sea itself, from the mouth of Back river in Buzzard's bay, to the mouth of Scusset river in Barnstable bay.

The distance was found to exceed seven miles; the elevation of the highest intermediate ground is forty feet above low water mark in Barnstable bay; the depth of water at the mouth of Black river does not, at low water, exceed seven feet and a half; and the channel to that spot through Buzzard's bay is obstructed by shoals. The tide which rises but three feet and a half in that bay, rises three hours and a half later, and more than eighteen feet in that of Barnstable. The shore on which that formidable tide would operate, is an open beach, without any harbor or shelter whatever. Independent of other obstacles, it was apprehended that the same natural causes which had formed the isthmus, might fill the canal, or make a bar at its entrance; and the project seems to have been abandoned.

2. The ground was also examined between Barnstable harbor on the north, and Hyanus harbor on the south, at some distance east of Sandwich. The breadth of the peninsula does not exceed here four miles and a half, and there would be a harbor at each end of the canal. The same difference exists in the tides which rise four feet in Hyanus, and sixteen feet in Barnstable harbor. The entrance of this is obstructed by shoals; but the great obstacle to a cross cut is the elevation of the intermediate ground, estimated at eighty feet above tide water. Navigable ponds on that high ground might, perhaps, form part of a lock canal, and supply the remainder with water. But a canal, frozen in winter, would not have effected the great object in view, which was to enable ves-

sels from sea to proceed in winter from Martha's Vineyard to Boston, without sailing around Cape Cod. Although the difficulty of the navigation from Boston to Barnstable diminishes the utility of this communication, as one of the great links in this line of inland navigation, it may be resorted to should that which will be next mentioned prove impracticable for sea vessels.

3. The attention of the Legislature of Massachusetts, under whose authority the grounds at Sandwich and Barnstable had been examined, has lately been turned to a direct communication between Weymouth landing, within the harbor of Boston and Taunton river, which empties into the bay of Rhode Island. A favorable report has been made during the last session, of which a copy has lately been obtained. The distance from tide water to tide water is twenty-six miles by one route, and twenty-three and a quarter miles by another. The highest intermediate ground is one hundred and thirty-three feet above tide water, but may be reduced ten feet by digging to that depth the length of a mile. Two ponds known by the name of Weymouth and Cranberry, the largest and least elevated of which covers five hundred acres, and is fourteen feet higher than the summit of the proposed canal, will supply the upper locks with water by feeders four miles long. Whether the quantity of water contained in those ponds, and estimated equal to a daily supply of 450,000 cubic feet, will be sufficient for a sloop navigation, and whether any other ponds or streams may be brought in aid, does not seem to be fully ascertained. After descending twenty feet towards Weymouth, and seventy towards Taunton, an ample supply for the lower locks will be derived from other large ponds, the principal of which are known by the names of Braintree and Nippinitic. The expense may, on a supposition that the route is partly through a rocky soil, be estimated as follows:

Digging twenty-six miles, at $30,000 a mile,	$780,000 00
Lockage two hundred and sixty feet, at $1,250 a foot,	325,000 00
Feeders, purchase of land, &c.	145,000 00
	1,250,000 00

II. New Jersey Canal.

A company was incorporated some years ago by the Legislature of New Jersey for opening a canal between the Raritan and Delaware. Acting under the erroneous opinion that the navigation of small rivers might be improved and used as a canal, the company intended to have united, by a cross cut of one mile, the Assampink or Trenton creek with Stony brook, a branch of Millstone river, and to have descended Trenton creek to the Delaware and Stony brook, and Millstone river to the Raritan. The capital, which was inadequate, was not paid; but their survey of the intended route has shown the practicability of a canal for sea vessels on a proper plan. The distance from Brunswick to Trenton is twenty-six miles; and the only obstacle on the way is the "sand hills," some distance west of Brunswick. These may, it is said, be avoided by a deviation which would not increase the distance more than two miles; and they may, at all events, be perforated as has been done by the turnpike company, who have opened a road on a straight line between the two towns without having in any place an angle of ascent of more than three degrees. The highest intermediate ground between Assampink and Stony brook is only fifty feet above tide water; and it is suggested that the summit level may be taken seven feet lower, cutting seven miles through a level meadow between the confluence of the Assampink and Shippetankin creeks and Rowley's mill, near the confluence of Stony brook and Millstone river.

An adequate supply of water will be drawn by short feeders from Philip's springs, Trenton creek, Stony brook, and Millstone river; all of which are more elevated than the route of the canal, the "sand hills" excepted.

The depth of water at the two extremities of the canal taken at low water are —— feet at Brunswick, and ten feet at Lamberton, one mile below Trenton.

The expenses may be estimated as follows:

Digging twenty-eight miles, at $20,000 per mile,	$560,000 00
Lockage, one hundred feet, (probably less,) at $1,250 per foot,	125,000 00
Feeders, purchase of land and water rights,	115,000 00
	800,000 00

III. Delaware and Chesapeake Canal.

A company incorporated by the States of Delaware and Maryland for opening this canal has commenced its operations; now suspended for want of funds.

The canal will commence at Welsh point, on Elk river, an arm of the Chesapeake, and terminate at a distance of twenty-two miles on Christiana creek, a branch of the Delaware. At low water the depth of water in Christiana is nine feet, and in Elk twelve feet, within one hundred feet from the shore. The tide rises four feet in both rivers. The canal might, without increasing the distance, be conducted to Newcastle on the Delaware itself, instead of ending on Christiana creek.

The highest intermediate ground over which the canal will be carried on a level of thirteen miles in length, is seventy-four feet above tide water, the descent being effected by nine locks on each side. The digging is generally easy; no expensive aqueducts or bridges, nor any other obstacle but those which have already been overcome in digging the feeder through a very rocky soil.

The supply of water drawn from Elk river by a feeder six miles in length, already completed, which is itself a boat canal three feet and a half deep, united by a lock of ten feet lift with the main canal, is calculated to fill daily one hundred and forty-four locks; a quantity sufficient on an average for the daily passage of twenty-four vessels. A reservoir covering thirty, and which may be increased to one hundred and fifty acres will supply occasional deficiencies. Other reservoirs may be added, and Christiana, White, and Clay creeks may hereafter be brought in aid of Elk river, if the supply should prove too scanty for an increased navigation.

The canal twenty-six feet wide at the bottom, and fifty at the top on the water line, being dug at the depth of eight feet, is intended for vessels of forty to seventy tons, drawing seven and a half feet water; but the banks, twenty feet wide for towing paths, and one of which may be converted into a turnpike road, being raised three feet above the level of the water, will, by increasing the height of the lock gates one foot, admit a depth of nine feet of water in the canal; at which depth it would perhaps be eligible to dig at once. The locks, eighty feet long, eighteen feet wide, and eight or nine feet deep over the gate-sills, containing each eleven thousand five hundred to thirteen thousand cubic feet of water, and with a lift of eight to nine feet each, will be constructed of hewn stone laid in tarras. Those dimensions, both of the canal and locks recommended by Mr. Latrobe, the engineer of the canal, may be adopted in all the other canals for sea vessels on this line of communication.

The present annual carriage across the peninsula, which would be drawn through the canal, is estimated at forty-two thousand tons, exclusively of passengers. This will be greatly increased by the facility which the canal itself

will afford to the commercial intercourse between the two bays, and to the conveyance of articles now carried through other channels, or too heavy for transportation at the present expense of carriage. The coals wanted for Philadelphia, and which, brought down from the sources of the Susquehannah and Potomac, but principally from the vicinity of Richmond, would naturally pass through the canal, have been alone estimated at more than one hundred thousand tons a year. The annual carriage of all articles may, in the present state of population, be fairly estimated at one hundred and fifty thousand tons, and the direct annual saving to the community at $300,000; being at the rate of two dollars a ton for the difference between land and water carriage across the peninsula, after paying the tolls. These, at the rate of fifty cents a ton, will give to the undertakers a revenue of $75,000, leaving, after a deduction of $10,000 for annual repairs, and of $10,000 more for attendance and contingencies, a nett income of $55,000.

The expenses of the whole work are estimated as follows:

Digging twenty-two miles, at $20,000 a mile, - - - -	$440,000 00
Eighteen locks, at $10,000 each, - - - - -	180,000 00
(The whole lockage, being one hundred and forty-eight feet, would, at $1250 a foot, amount to $185,000 00.)	
Feeder, (nearly completed) reservoirs, lock at the feeder, purchase of water rights and land, including a debt of ——— dollars, due by the company, - - -	230,000 00
	850,000 00

The interest on which sum at 6 per cent. is $51,000.

The capital originally subscribed amounted to $400,000, divided into two thousand shares of two hundred dollars each. One-half of these has been forfeited, after a small payment of five dollars on each share; $100,000 paid by the other stockholders have been expended in preparatory measures in the purchase of water rights, and in digging the feeder, which was considered as the most difficult part of the work; $750,000 are still wanted to complete the work, of which sum $100,000 are payable by the stockholders, and the deficiency of $650,000 must be drawn from other sources.

IV. Chesapeake and Albemarle.

1. The shortest communication between the Chesapeake and Albemarle sound is from North Landing, at the head of the tide of Northwest river, which empties into Currituck inlet, the easternmost arm of Albemarle to either Kempsville or Great Bridge, at the head of the tide of two different branches of the south branch of Elizabeth river, which, passing by Norfolk, unites at Hampton Roads with James river and the Chesapeake. The distance is stated at seven miles, and the levels said to be favorable. It is believed that the principal reason why this communication has not been attempted is, a bar in Currituck inlet, which does not admit the passage of vessels drawing five feet water.

2. A company incorporated by the States of Virginia and North Carolina, for opening a canal through the Dismal Swamp, has made considerable progress in the work.

The canal extends twenty-two miles in length from Deep creek, a branch of the south branch of Elizabeth river, seven miles above Norfolk to Joyce's creek, a branch of Pasquotank river, a northern arm of Albemarle sound. Vessels drawing eight to nine feet water may ascend both creeks to each extremity of the canal.

The intervening ground along the eastern margin of the Dismal Swamp is almost level; the rise towards the middle not exceeding two feet above the two extremities, which are only eighteen feet and nine inches above tide water. The digging is very easy; the only obstacles arise from the stumps and roots of trees, and are nearly overcome; and a single aqueduct, or rather culvert, over a small run emptying into the Northwest river, is necessary.

The swamp itself supplies, at the depth at which the canal is cut, the water which has heretofore been wanted, and a sufficient supply may be drawn by a feeder of three miles and a half in length, cut through a perfect level from Lake Drummond, a natural reservoir in the centre of the swamp, of fifteen miles in circumference, and about six feet higher than the water in the canal.

The canal, as cut by the company, is twenty-four feet wide, and six feet deep, with one bank on the west side for a towing path, eighteen feet broad. The whole digging, with the exception of two miles, which must be deepened three feet, and of three-quarters of a mile in another place not entirely finished, has been completed. The locks at the two extremities of the canal are not built, but two have been erected at some distance from each extremity, probably in order to save some digging in the intervening space; they are made of square Juniper logs, and have cost only three hundred dollars each.

The expense of digging has not exceeded four thousand dollars a mile; the whole capital expended amounts to one hundred thousand dollars, of which the State of Virginia has furnished seventeen thousand five hundred; and it is stated that the whole work may be completed in one year, and will not, including the locks and the payment of some debts contracted by the company, exceed twenty-five thousand dollars. But the canal which, by the original act of incorporation, was to be thirty-two feet wide and eight feet deep, can, on its present plan, be considered only as a local object, the principal utility of which consists in bringing to market the otherwise useless lumber of the swamp. The only boats which navigate it are flats, forty feet long, six feet wide, drawing two feet of water, and carrying eight thousand shingles.

It must, in order to become a national object, be capable of receiving vessels which navigate Albemarle sound, and for that purpose be restored to its first intended dimensions, or rather be widened and deepened on the plan adopted for the Chesapeake and Delaware canal. The expense would be as follows:

Digging, viz: deepening to 8 feet, preserving the same level the whole way, and widening to a proper breadth, 22 miles, at eight thousand dollars a mile, - - -	176,000 00
Four stone locks, at ten thousand dollars, - - - - -	40,000 00
Feeder to Lake Drummond, aqueduct, and contingencies, - - - -	34,000 00
	$250,000 00

3. The last mentioned canal is in the most direct line of the communication through Albemarle to Pamlico sound, and the adjacent southern sounds. It has been objected that the navigation of Pasquotank river was intricate, and that it would be more advantageous to open a communication with Chowan river, which, passing by Edenton, and then uniting with the Roanoke, forms Albemarle sound.

A company was incorporated for that purpose, but the capital was not filled, and no other operation performed but surveying the ground. The intended canal on that route would commence at Suffolk on Nansemond

river, which empties into James river, a few miles above and west of the mouth of Elizabeth river, and passing along the western margin of the Dismal Swamp would reach, at a computed distance of thirty miles, Gates' court house on Bennet's creek, a branch of Chowan river, which vessels drawing ten feet of water may ascend to that spot.

The highest intermediate ground is twenty-eight feet above tide water, and, consequently, higher than the surface of Lake Drummond. But Bennet's creek and Curripeake swamp were considered as affording a sufficient supply of water. Should this prove adequate the principal objection to this route will be, that the canal lands at Suffolk instead of Norfolk. This consideration, and the capital already expended on the canal from Elizabeth river to Pasquotank, seem to give a preference to this course. To which may be added, that if it be preferable to strike the waters of Chowan river, a lateral canal may be hereafter opened along the southern margin of the Dismal Swamp, from the southern extremity of the Elizabeth and Pasquotank canal, to Bennet's creek or Edenton. Whatever route may, after a critical examination of the ground, be thought the most eligible, the opening of this communication will be more easy and less expensive than either of the three northern canals.

The following table is a recapitulation of the distance to be cut on the whole line, and of the estimated expense:

Canals.	Direction.	Distance.	Lockage.	Expense.
		Miles.	Feet.	
Massachusetts canal, - -	Weymouth to Taunton, -	26	260	$1,250,000 00
New Jersey canal, - -	Brunswick to Trenton, -	28	100	800,000 00
Delaware and Chesapeake canal, -	Christiana to Elk, -	22	148	750,000 00
Chesapeake and Albemarle canal, -	Eliz. river to Pasquotank,	22	40	250,000 00
Total, - -	- - -	98	548	$3,050,000 00

COMMUNICATIONS BETWEEN THE ATLANTIC AND WESTERN WATERS.

The Appalachian mountains, to use an ancient generic denomination, extend in a direction west of south, from the 42d to the 34th degree of north latitude, approaching the sea, and even washed by the tide in the State of New York, and thence in their southerly course gradually receding from the sea-shore. Viewed as a whole, their breadth may be estimated at one hundred and ten miles, and they consist of a succession of parallel ridges, following nearly the direction of the seacoast, irregularly intersected by rivers, and divided by narrow valleys. The ridge which divides the Atlantic rivers from the western waters, generally known by the name of Allegany, preserves throughout a nearly equal distance of two hundred and fifty miles from the Atlantic Ocean, and a nearly uniform elevation of three thousand feet above the level of the sea.

Those mountains may, however, be perhaps considered as consisting of two principal chains; between these lies the fertile limestone valley, which, although occasionally interrupted by transversal ridges, and, in one place, by the dividing or Allegany ridge, may be traced from Newburgh and Esopus on the Hudson river to Knoxville on the Tennessee.

The eastern and narrowest chain is the Blue Ridge of Virginia, which, in its northeast course, traverses, under various names, the States of Maryland, Pennsylvania, and New Jersey, forms the high lands broken at West Point by the tide of the Hudson, and then uniting with the Green mountains, assumes a northerly direction, and divides the waters of the Hudson and Lake Champlain from those of Connecticut river. On the borders of Virginia and North Carolina, the Blue Ridge is united by an inferior mountain with the great western chain, and thence, to its southern extremity, becomes the principal or dividing mountain, discharging eastwardly the rivers Roanoke, Pedee, Santee, and Savannah into the Atlantic Ocean; southwardly, the Chatahoochee and the Alabama into the Gulf of Mexico; and westwardly, the New river and the Tennessee. The New river, taking a northwardly course, breaks through all the ridges of the great western chain, and, at a short distance beyond it, unites, under the name of Kanhawa, with the Ohio. The Tennessee pursues at first a southwest direction between the two chains, until having reached, and in a westwardly course turned, the southern extremity of the great western chain, it assumes a northwardly direction, and joins its waters with those of the Ohio, a few miles above the confluence of that river with the Mississippi.

The western chain, much broader, and generally more elevated, is known under the name of Cumberland and Gauley mountains, from its southern extremity near the great bend of the Tennessee river, until it becomes in Virginia the principal or dividing mountain; thence, in its northerly course, towards the State of New York, it discharges westwardly the Green Briar river, which, by its junction with the New river, forms the Kanhawa, and the rivers Monongahela and Allegany, which, from their confluence at Pittsburg, assume the name of Ohio. Eastwardly it pours into the Atlantic Ocean James river, the Potomac, and the Susquehannah. From the northernmost and less elevated spurs of the chain, the Genesee flows into Lake Ontario; and in that quarter, the northerly branches of the Susquehannah seem to take their source from amongst inferior ridges, and, in their course to the Chesapeake, to break through all the mountains. From the Susquehannah the principal chain assumes a more eastwardly direction, and washed on the north by the lateral valley of the river Mohawk, whilst it gives rise southwardly to the Delaware, it terminates under the name of Catskill mountain, in view of the tide water of the Hudson.

This description has been introduced for the double purpose of pointing out all the rivers which can afford the means of communication, and of showing the impracticability, in the present state of science, of effecting a canal navigation across the mountains.

The most elevated lock canal, of which a correct description has been given, is that of Languedoc; and the highest ground over which it is carried is only six hundred feet above the sea. It is not believed that any canal has been undertaken, or at least completed in England, of an elevation exceeding four hundred and thirty feet above the waters united by it. The Allegany mountain is generally, and from observations made in several places, about three thousand feet above the level of the sea. The precise height of the dividing ridge was ascertained by the commissioners who laid out the United States road from Cumberland on the Potomac, to Brownsville on the Monongahela, at two thousand two hundred and sixty feet above the first, and at two thousand one hundred and fifty feet above the last river. Cumberland, from the levels taken by the Potomac company, is itself seven hundred and thirty-five feet above tide water. Although some more advantageous and less elevated places may be found, particularly amongst the ridges which divide some of the upper branches of the Susquehannah from the corresponding streams emptying into the river Allegany, there is none which is not of an elevation much beyond what has ever been overcome by canals in any other country. The impracticability arises from the principle of lock navigation, which, in order to effect the ascent, requires a greater supply of water in proportion to the height to be ascended,

whilst the supply of water becomes less in the same proportion. Nor does the chain of mountains, through the whole extent where it divides the Atlantic from the western rivers, afford a single pond, lake, or natural reservoir. It may be added, as a general feature of American geography, that except in the swamps along the southern seacoast, no lake is to be found in the United States south of 41° north latitude; and that almost every river north of 42° issues from a lake or pond.

The works necessary in order to facilitate the communications from the sea-ports across the mountains to the western waters, must, therefore, consist either of artificial roads extending the whole way from tide water to the nearest and most convenient navigable western waters; or of improvements in the navigation of the leading Atlantic rivers, to the highest practicable points, connected by artificial roads across the mountains, with the nearest points from which a permanent navigation can be relied on down the western rivers.

The principal considerations in selecting proper directions for those communications are the distance from the navigable western waters, both to tide water, and to the nearest navigable Atlantic river, and the extent of navigation, either natural or susceptible of improvement, which may be afforded by the rivers; distance alone is mentioned, so far as relates to roads, because the mountains, however insuperable for canals, offer no important impediment to land communications. So far from being an insurmountable barrier to commercial intercourse between the two great sections of the Union, it is now ascertained that those mountains may, almost in every direction, be crossed by artificial roads as permanent, as easy, and less expensive than similar works in the lower country; for Congress having, contrary to current opinion, directed that the road from Cumberland to Brownsville should be laid out so that its ascent should not in any place exceed an angle of five degrees with the horizon, no difficulty has been experienced in effecting the object without cutting through hills; and, although the road thus laid out be, in a distance of seventy-two miles, two or three miles shorter than that heretofore in use.

Although the distance from the sea to the principal dividing mountain, through its whole length, between the western sources of the Susquehannah and those of the Savannah, be nearly the same, yet the Atlantic bays penetrating the coast at different depths and in different directions, the distance from the sea-ports to the nearest western navigable waters varies considerably. Taken in straight lines from each port to the nearest branch, beyond all the mountains of each of the four great western rivers, they may be stated as follows:

From Philadelphia to the confluence of Conemaugh and Loyalhannon, branches of the Allegany, -	miles, 220
From the city of Washington to the confluence of the rivers Monongahela and Cheat, - -	150
From Richmond to Morris's on the Kanhawa, below all the falls of that river, - - -	210
From Savannah or Charleston to any navigable branch of the Tennessee, the distance exceeds -	300

The distance from the same western points to the upper navigation of the corresponding Atlantic rivers cannot be stated with precision, as the upper points, to which the navigation of these rivers may be improved, are not yet ascertained. The shortest portage between the waters of the Potomac and those of the Monongahela, in their natural state, from West Point on the Potomac to Cheat river below the falls, is about fifty miles in a straight line; but, in order to secure a tolerable navigation, particularly on the Potomac, the route from Cumberland to Brownsville (Red Stone Old Fort) has been preferred, and the distance by the road lately laid out is seventy-two miles. The portage between the north fork of the Juniata, a branch of the Susquehannah, and the corresponding waters of the river Allegany is somewhat shorter. That between Pattonborough, on James river, and the falls of the Kanhawa, exceeds one hundred miles.

The most prominent, though not perhaps the most insuperable obstacle in the navigation of the Atlantic rivers, consists in their lower falls, which are ascribed to a presumed continuous granite ridge, rising about one hundred and thirty feet above tide water. That ridge from New York to James river inclusively arrests the ascent of the tide; the falls of every river within that space being precisely at the head of the tide; pursuing thence southwardly a direction nearly parallel to the mountains, it recedes from the sea, leaving in each southern river an extent of good navigation between the tide and the falls. Other falls of less magnitude are found at the gaps of the Blue Ridge, through which the rivers have forced their passage. Higher up, the rapidity of the northern rivers, which penetrates through the inferior ridges of the great western chain, increases as they approach the dividing or Allegany mountain, and their sources being nearly at the same elevation, their rapidity increases in proportion to the shortness of their course. For that reason the navigation of the Susquehannah, above the Blue Ridge, is better than that of the Potomac, which affords, as has been stated, the shortest communication from tide water to the nearest western river. The levels of the last mentioned river having been taken by the Potomac company, the general result is annexed, as giving a more correct idea of the navigation of the Atlantic rivers than could be conveyed in any other manner:

	Distance.	Fall.	Rate of Fall.
From the mouth of Savage river down to Cumberland, - - - - - - -	31 miles,	445 feet,	14½ feet per mile.
Thence to the Blue ridge, - - - -	130¼ do.	490 do.	4 do.
Harper's Ferry or Shenandoah Falls, - -	5¼ do.	43 do.	
Thence to Great Falls, - - - -	40 do.	39 do.	1 do.
Great and Little Falls to tide water, - -	12 do.	143 do.	
Total, -	219 miles,	1,160 feet.	

The papers, marked C, contain the information which has been collected respecting the works executed or contemplated on the great rivers already enumerated. It has not been understood that any improvements of importance had been yet attempted on the Savannah and Pedee, nor on any of the tributary streams of the Ohio; and the communications received under this head relate only to the Santee, Roanoke, James river, Potomac, Susquehannah, and Ohio.

I. Santee.

The Santee or Catawba is said to be occasionally navigable for near three hundred miles as high up as Morgantown, in North Carolina. Two companies have been incorporated by that State and the State of South Carolina, for the purpose of improving its navigation. The Lower Falls are above Camden, and not far from the arsenal of the United States at Mount Rock. A canal had been commenced there, but, either from want of success in the

commencement, or from want of funds, the work appears to be suspended. The market for the produce brought down that river is Charleston; and the river boats were obliged, at the mouth of the river, to enter the sea, and to reach that port by a navigation along the sea-shore for which they were not calculated. To remedy that inconvenience, and to ensure a permanent navigation, a canal has been opened by another company, uniting the Santee with Cooper river, which empties into the harbor of Charleston.

The distance between the points united is twenty-two miles; the highest intervening ground was fifty-two feet above the Santee, and eighty-five feet above the river Cooper; but it has been reduced seventeen feet by digging. The descent to Santee being thirty-five feet, effected by four locks, and that to Cooper sixty-eight feet, effected by nine locks.

The principal supply of water is afforded by springs arising from the marshy ground at the bottom of the canal, and by several drains which collect and bring from an adjacent swamp the sources of the river Cooper. The quantity is said to be seldom deficient; yet a steam engine has been contemplated as perhaps necessary in order to raise from the Santee an adequate supply.

The canal was carried over some small streams by means of aqueducts; inconsiderable ravines have been filled, and the ground was dug in some places to the depth of sixteen feet in order to preserve the level. But it appears that the roots of trees were the greatest obstacle encountered in digging the canal. Its breadth is twenty feet at the bottom, and thirty-five feet at top; the depth of the water is four feet, and it admits boats of twenty tons. The locks made of brick, faced with marble, are sixty feet long and ten feet wide.

The capital expended is stated at $650,667, including sixty negroes and some tracts of land belonging to the company. The canal has been completed six years; the annual tolls had never exceeded $13,000 before the year 1807, and the annual expenses are stated at $7,000. The want of success in this undertaking, which, though completed is very unprofitable, may be ascribed to several causes. The expense, compared with the work, is much greater than might have been expected, and probably than was necessary. The locks are too small for large boats, which are therefore obliged to pursue the former route down the Santee, and by sea to Charleston; and the want of water is alleged as a sufficient reason for the size of the locks. But a canal in that situation cannot, in America, be profitable, unless the navigation of the main river with which it communicates is rendered safe and permanent; and whenever that of the Santee itself shall have been improved, the utility and profits of the canal will be considerably increased.

II. The Lower or Great Falls of Roanoke,

Consist in a succession of rapids, which, in a distance of fifteen miles, have a fall of ninety-three feet. This obstruction is such that almost all the tobacco of that river is transported by land to Petersburg, on the Appomatox branch of James river. A canal has been contemplated from the upper end of the falls to Murfreesborough, situated on the tide water of a branch of Chowan river, twenty-five miles above the mouth of Bennet's creek, which has been before mentioned as one of the lines of communication between Albemarle sound and the Chesapeake. The level is said to be favorable without any obstructions or valleys in the way. The distance is thirty-eight miles, and the expense of a small canal for boats drawing two feet and and a half of water may be estimated as follows:

Digging thirty-eight miles, at $6,000 a mile,	$228,000
Lockage ninety-three feet, at $800 a foot	74,400
Feeder, land, &c.	47,600
	$350,000

The capital for this canal has never been subscribed, and it has been suggested that it would be practicable to open one to Petersburg. It is not believed that any hills intervene in that course; and the greatest obstacle will be found in crossing the branches of Chowan river.

III. James River.

A company, incorporated by the State of Virginia for the improvement of the navigation of the river generally, has removed some obstructions in the upper part of the river, and is bound by the charter to render it so far navigable that there may never be less than twelve inches of water over any of the shoals or rapids, from the upper end of the Lower or Great Falls to Pattonborough, a distance of two hundred and twenty miles. The natural navigation of the river through that extent is considered as better than that of any other Atlantic river above the falls.

A communication has been opened by the company from Westham, at the upper end of the Great Falls, to Shockoe hill, in the city of Richmond, in the following manner: The water is drawn at Westham from the river into a canal two hundred yards in length, at the end of which boats descending thirty-four feet through three locks re-enter the river, and, after using its natural navigation three miles, are brought by a canal three miles and a half in length to a basin on Shockoe hill, where the navigation terminates.

That basin is about eighty feet above tide water, and one mile and a half from Rockets, the port of Richmond. The whole fall from the upper end of the canal at Westham to the basin may be stated at forty-eight feet, and the distance at six miles and a half. The canal is twenty-five feet wide, and admits boats of eight tons drawing three feet water. The locks, eighty feet long and sixteen feet wide, are of solid masonry; but the cement is defective. The aqueducts have been thrown across valleys intervening in the course of the canal, and some difficult digging was necessary on the side of the hills and through ledges of rocks.

The canal, according to the charter, was intended to have been brought down to tide water. The performance of that condition is now suspended by an act of the Legislature of Virginia, and there seems to be a considerable diversity of opinion on that subject. In a national point of view, the plan which will, at the least expense, put coals on board vessels lying at Rocket's, deserves the preference. For coal is in no other parts of the United States found in abundance in the vicinity of tide water. At present the expense of transportation by the canal is already reduced to one-third of the land carriage.

The original capital of the company amounted to $140,000, of which the State of Virginia owns $50,000, and $91,000 arising from the proceeds of tolls had, before the 1st January, 1805, been applied to the work, making together an expenditure of $231,000. The annual tolls raised on fourteen thousand tons of country produce, and on two thousand coal boats, have amounted to $16,750; and the annual repairs and expenses are estimated at $5,000. But as the company draw also a revenue from the rent of water, applied to mills and other water-works erected along the canal, they have been able in some years to make dividends of $16,800, being at the rate of twelve per cent. on the original capital, but of only about seven per cent. if calculated on the sum of $244,000, the amount of capital expended, and interest accrued before any dividend was made.

IV. Potomac.

The company incorporated by the States of Maryland and Virginia for improving the navigation of that river has executed the following works:

1. At a distance of twelve miles above the head of the tide which ascends about three miles above the city of Washington, the river is one hundred and forty-three feet higher than tide water. At that place, designated by the name of *Great Falls*, the boats passing through a canal one mile in length, six feet deep, and twenty-five feet wide, descends seventy-six feet by five locks, one hundred feet long, and twelve feet wide each, and re-entering the river, follow its natural bed eight miles and a half. Another canal, of the same dimensions, and two miles and a half in length, brings them then through three locks, and by a descent of thirty-seven feet to tide water. This last fall is distinguished by the name of *Little Falls*. The two lower locks of the Great Falls, excavated out of the solid rock, have each a lift of eighteen feet: the three upper locks of solid masonry are of unequal height, and have, together, a lift of forty feet. The three locks of the Little Falls are each one hundred feet in length, and eighteen feet wide. That breadth is unnecessary, and consumes too much water, a defect which will be remedied when stone locks will be substituted to those now in use, which, being of wood, will soon be decayed.

Three other canals without locks have been opened around three distinct falls: the principal at the Shenandoah Falls, below Harper's Ferry; and at the place where the Potomac breaks through the Blue Ridge is one mile in length around a fall of fifteen feet. Between this and the Great Falls another canal three-fourths of a mile in length is opened around the Seneca Falls. The third, fifty yards in length, has been cut around Houre's Falls, five miles above the Shenandoah Falls. Above this place the navigation has been improved by deepening occasionally the channel, raising the water in shallow places by small dams, and opening sluices along the shore. It is believed that, by multiplying the number of those low dams, by throwing the channel along the shore, and when necessary opening canals with or without locks around the principal rapids, the navigation may be improved perhaps as high up as Cumberland, one hundred and eighty-eight miles above tide water, to such a degree as to render the river passable for boats the greater part of the year. And if this be found practicable on the Potomac, which is the most rapid of the great Atlantic rivers, the same improvements may, with greater facility, be effected on any of the others. It will be indispensable in order to attain that object on the Potomac, that additional canals with locks should be opened at the Shenandoah or Blue Ridge Falls, which, as has already been stated, fall forty-three feet in the distance of five miles.

2. The Shenandoah, a river nearly as large as the Potomac itself, after a course of two hundred and fifty miles through the great Limestone valley, unites its waters with those of the Potomac at Harper's Ferry, just above the Blue Ridge. From Port Republic, till within eight miles of the Potomac, a distance of near two hundred miles, it affords a good navigation, the fall of the river being at the rate of less than two feet a mile. In the last eight miles it falls eighty feet, and was impassable before the improvements completed last year by the Potomac company. Six different canals twenty feet wide, four feet and a half deep, and extending altogether two thousand four hundred yards, have been opened around the most difficult falls. Through those and five stone locks one hundred feet long and twelve feet wide each, and effecting together a descent of near fifty feet, the communication is now opened, and will render the undertaking much more productive than heretofore. The water in all those canals and locks, as well as in those executed on the Potomac, is uniformly supplied by the river itself.

The capital originally subscribed amounted to $311,560, divided into seven hundred and one shares, of which the State of Maryland owns two hundred and twenty, and the State of Virginia seventy. The total amount expended, including an additional payment received from late subscribers, $38,000, arising from tolls which have been applied to the work, and a debt of about $67,000 contracted by the company, amounts to $444,652. The annual tolls raised on eight thousand tons of sundry articles, valued at more than half a million of dollars, have not before the opening of the Shenandoah exceeded $15,000; and the annual expenses and repairs are stated at $5,000. One hundred shares of £145 sterling each remain open for subscription.

V. Susquehannah.

This river has no perpendicular or altogether impassable falls; but, from the head of the tide up to the Pennsylvania line, a distance of ten miles, the navigation is impeded by a succession of dangerous rapids; and these, though occasionally separated by sheets of smooth water, continue forty miles higher up, at least as far as Columbia; the whole fall from this place to the head of the tide being estimated at about one hundred and forty feet. The navigation, through that distance, at all times dangerous, is practicable only during the high freshets, when rafts and flat bottomed boats, eighty feet long and seventeen feet wide, may descend from the several widely extended upper branches of the river. Less dangerous falls are found at the place where it breaks through the Blue Ridge; above which the natural navigation from Middletown upwards, whether up the Juniata, the west branch, or the east branch, is much better than that of the Potomac, and has been improved in several places at the expense of the State of Pennsylvania. A canal one mile long and four feet deep, with two brick locks, has also been opened around the Conewago Falls in the gap of the Blue Ridge, $14,000 having been paid for that object by the same State. Its entrance is difficult, and it is used for water works, being free for navigation, though private property. From Columbia down to the Maryland line considerable improvements in the bed of the river have also been made at the expense of the two States, and the descending navigation has, on the whole, been improved: but few boats ever attempt to ascend. Nor is it believed that the natural advantages of the most considerable Atlantic river will ever be fully enjoyed until a canal shall have been opened the whole way from Columbia, either to tide water or to the Delaware and Chesapeake Canal.

A company incorporated by the State of Maryland for opening a canal around the falls in that part of the river which extends from the Pennsylvania line to tide water, has completed that part of the work, the utility of which is but very partially felt, whilst the bed of the river remains the only communication from its upper extremity up to Columbia.

The canal, thirty feet wide and three feet deep, and admitting boats of twenty tons, is nine miles in length, with a fall of fifty-nine feet. The descent is effected by eight stone locks, each of which is one hundred feet in length and twelve feet wide. The water is supplied by the river itself; and, in order to cross the rivers Conawingo and Octorara, these, by means of dams, have been raised ten and twelve feet to the level of the canal.

Its defects consist in the want of sufficient breadth of the locks, which do not admit the rafts and wide flat bottomed boats generally used in bringing down the country produce, and in want of water at the lower end of the canal, This last defect may be remedied by extending the canal seven hundred yards lower down along the edge of the river; and it is probable that as timber will become more scarce and valuable in the upper branches of the Susquehannah, boats of a different construction will be used. In the mean time the annual tolls have not yet amounted to $1,000. whilst the annual expenses are stated at $1200, and the capital expended at $250,000.

The attempts made to open a communication from Middletown, in the Limestone valley, to Philadelphia, partly by canals, and partly by means of the Schuylkill, will be noticed under the head of "Interior Canals."

VI. Ohio.

The navigation of the Kanhawa and of the eastern branches of the Tennessee, Monongahela, and Allegany, in their course through the mountains, may at a future period be improved. But, from the foot of the mountains, all those rivers, and particularly the Ohio, flow with a much gentler current than the Atlantic rivers, a circumstance easily accounted for when it is recollected that Brownsville, on the Monongahela, and at a distance of two thousand miles by water from the sea, is only one hundred and fifteen feet more elevated than Cumberland, on the Potomac; whilst this river, with all its meanders, reaches tide water within less than two hundred miles. All those rivers at the annual melting of the snows rise to the height of more than forty feet, affording from the upper points to which they are navigable a safe navigation to the sea for any ship that can pass over the bar at the mouth of the Mississippi. As early as the year 1793, a schooner, built on the Monongahela, between Brownsville and Pittsburg, reached New Orleans by that extraordinary inland navigation, and arrived safely at Philadelphia. This first essay stimulated the spirit of enterprise so conspicuous in the American character, and numerous vessels, from one hundred to three hundred and fifty tons burden, are now annually built at several shipyards on the Ohio, even as high up as Pittsburg, and bringing down to New Orleans the produce of the upper country consumed there, carry to Europe and to the Atlantic ports of the United States the cotton, the sugar, and the tobacco of Louisiana and of the States of Tennessee and Kentucky.

That branch of national industry gives value to the immense forests of the Ohio and of its numerous branches, and will soon make a considerable, and perhaps necessary accession to the shipping of the United States, and has a tendency to diminish the price of freights from New Orleans to the other American and to foreign ports. The importance of this last consideration will be duly felt, if the magnitude of the exports of which New Orleans is destined to be the emporium, be contrasted with the probable amount of its importations; for such are the labor, time, and expense necessary to ascend the rapid stream of the Mississippi, (and the nature of its banks, annually overflowed on a breadth of several miles, precludes the possibility of towing paths,) that, whilst the greater part of the produce of the immense country, watered by that river and its tributary streams, must necessarily be exported through its channel, the importations of a considerable portion of that country will continue to be supplied from the Atlantic seaports, by water and land communications, susceptible of considerable improvement; and thus, unless another outlet be found for a portion of the exports, or unless the upper country can supply vessels, those exports must necessarily pay a double freight.

The only impediments to that navigation are on the Tennessee, "the Muscle shoals," of which no particular account has been received, and on the Ohio, the falls of Louisville. Ordinary boats can with difficulty pass these in summer, and the navigation is, even during the freshets, dangerous for the large vessels. The attention of the Legislature of Kentucky, and of the inhabitants of the Western country, generally, has, therefore, been particularly drawn to the opening of a canal at that place. A company has been lately incorporated by the State of Kentucky for that purpose, with a capital which may amount to $500,000, but a small portion of which has yet been subscribed. The expense, however, is estimated at a sum less than the nominal capital.

The proposed canal would be near two miles in length, and must be dug, in some places, to a depth of twenty-seven, but generally about sixteen feet. The breadth at the bottom being twenty feet, with the necessary slope, would make it, generally, sixty-eight feet wide at top, and, in particular places, not less than one hundred. The fall at low water is about twenty-two feet, and would require three locks, of dimensions sufficient to pass ships of four hundred tons, and drawing fourteen feet of water. The greatest expense will be that of digging, and removing the earth, which may be estimated at four hundred thousand cubic yards, and, according to the representation made of the nature of the ground, will not probably cost more than $200,000. To this may be added $100,000 for the locks and other necessary works, making, altogether, $300,000. The greatest difficulty seems to be the protection of the locks and canals against the rise of the river, which sometimes overflows the whole ground through which the canal must be opened.

The expense of the improvements suggested in the communications between the Atlantic and Western waters may be stated as follows:

1st. Four artificial roads from the four great Western rivers, the Allegany, Monongahela, Kanhawa, and Tennessee, to the nearest corresponding Atlantic rivers, the Susquehannah or Juniata, the Potomac, James river, and either the Santee or Savannah, leaving to the several States the continuation of those roads eastwardly to the nearest seaports. Those roads should unite on each river points from which a permanent and safe navigation downwards could, except during the driest season, be relied on; and will, therefore, on each route, be estimated at one hundred miles, making, altogether, four hundred miles, which, at $7,000 a mile, the materials being generally on the spot, would cost - - - - - -	$2,800,000
2dly. The improvement of the navigation of the four Atlantic rivers, from tide water to the highest practicable point, effected, principally, by canals around the falls wherever practicable, and by locks wherever necessary. The most expensive of these would be the proposed canal from Columbia, on the Susquehannah, either to tide water or to the Delaware and Chesapeake canal; and, considering how much has been effected already, and may still be done on the other rivers, by the several incorporated companies, it is believed that every useful improvement might be completed by a public expenditure not exceeding - - - - -	1,500,000
3dly. The canal at the falls of the Ohio, estimated at - - - - -	300,000
	$4,600,000

Although a canal navigation, uniting the Atlantic and Western waters in a direct course across the mountains, appears impracticable, yet those mountains may be turned either on the north, by means of the Mohawk valley and of Lake Ontario, or on the south, through Georgia and the Mississippi Territory. The first communication will be noticed under the head of "the river St. Lawrence and Great Lakes." Of the second it will be sufficient to observe that the country lying between the sources of the rivers Chatahoochee and Mobile, and the Gulf of Mexico, is an inclined plane, regularly descending towards the sea, and that, by following the proper levels, it presents no natural obstacle to the opening of a canal, fed by the waters of the two last-mentioned rivers, and extending from the tide water on the coast of Georgia to the Mississippi. The distance, in a direct line, is about five hundred and fifty miles, and, to be overcome, requires only time, perseverance, and labor. When it is recollected that such an undertaking would discharge the Mississippi into the Atlantic, the remarks already made on the trade of

that river, and other obvious considerations, will sufficiently point out its immense importance. Nor should the plan, on account of its magnitude, be thought chimerical; for the elevation and other natural obstacles of intervening ground, or want of a sufficient supply of water, and not distance, are the only insuperable impediments to an artificial navigation.

This work, which is presented, not as an immediate, but as a distant object, worthy of consideration, would probably require ten millions of dollars and thirty years for its completion. The annual sales of the public lands in the Mississippi Territory, which are estimated at fifty millions of acres, would, after paying the debt due to the State of Georgia, afford sufficient funds; and the increased value of the residue would alone more than compensate the expense.

It is proper to add that an inland navigation, even for open boats, already exists from New Orleans, by the canal Carondelet, to the lake Pontchartrain, thence, between the coast and the adjacent islands, to the bay of Mobile, and up its two principal rivers, the Alabama and the Tombigbee, to the head of the tide, within the acknowledged boundaries of the United States. The current of these two rivers being much less rapid than that of the Mississippi, they have long been contemplated, particularly the Tombigbee, as affording a better communication to the ascending or returning trade from New Orleans to the waters of the Tennessee, from which they are separated by short portages.

COMMUNICATIONS BETWEEN THE ATLANTIC RIVERS AND THE RIVER ST. LAWRENCE AND GREAT LAKES.

Vessels ascend the river St. Lawrence from the sea to Montreal. The river Sorel discharges at some distance below that town the waters of Lake George and Lake Champlain, which penetrate southwardly within the United States. From Montreal to Lake Ontario, the ascent of the river St. Lawrence is estimated at about two hundred feet. From the eastern extremity of Lake Ontario, an inland navigation for vessels of more than one hundred tons burthen, is continued for more than one thousand miles, through Lakes Erie, St. Clair, and Huron, to the western and southern extremities of Lake Michigan, without any other interruption than that of the falls and rapids of Niagara, between Lake Erie and Lake Ontario. The descent from Fort Schlosser to Devil's Hole, a distance of four miles, which includes the perpendicular falls of Niagara, has, by correct measurement, been ascertained at three hundred and seventy-five feet. The whole fall from Lake Erie to Lake Ontario is estimated at four hundred and fifty feet, making the elevation of Lake Erie above tide-water six hundred and fifty feet.

Lake Superior, the largest of those inland seas, communicates with the northern extremity of Lake Huron, by the river and rapids of St. Mary's. The fall of these is not ascertained; but it is said that a small canal has been opened around the most difficult part by the Northwest Fur Company.

Five of the Atlantic rivers approach the waters of the St. Lawrence; viz: The Penobscot, Kennebeck, Connecticut, the North or Hudson river, and the Tioga branch of the Susquehannah. This last river will afford a useful communication with the rivers Seneca and Genesee, which empty into Lake Ontario. The length of the portage has not been precisely stated; and the general navigation of the Susquehannah has already been noticed. It may, however, be observed, that it is the only Atlantic river whose sources approach both the Western waters and those of the St. Lawrence.

The three Eastern rivers afford convenient communications with the province of Lower Canada, but not with that extensive inland navigation which penetrates through the United States, within two hundred miles of the Mississippi. No statement has been received of any improvement having yet been made on the Penobscot or Kennebeck; and a very imperfect account has been obtained of some short canals opened around the several falls of the river Connecticut. One at Bellows' Falls, in the State of Vermont, has been particularly mentioned, and is the highest improvement on the river.

What is called the North river is a narrow and long bay, which in its northwardly course from the harbor of New York breaks through or turns all the mountains, affording a tide navigation for vessels of eighty tons to Albany and Troy, one hundred and sixty miles above New York. This peculiarity distinguishes the North river from all the other bays and rivers of the United States. The tide in no other ascends higher than the granite ridge, or comes within thirty miles of the Blue Ridge, or Eastern chain of mountains. In the North river it breaks through the Blue Ridge at West Point, and ascends above the Eastern termination of the Catskill, or great Western chain.

A few miles above Troy, and the head of the tide, the Hudson from the north, and the Mohawk from the west, unite their waters, and form the North river. The Hudson, in its course upwards, approaches the waters of Lake Champlain, and the Mohawk those of Lake Ontario.

I. Hudson and Champlain, or Northern Navigation.

A company was incorporated several years ago by the State of New York, for the purpose of opening this communication, and a survey taken by Mr. Weston, a copy of which has not yet been obtained. From collateral information, it appears that it was proposed to open a canal twelve miles long, with a lockage of one hundred and six feet, from Waterford, at the confluence of the Hudson and Mohawk, to the upper end of the great falls of Stillwater. This was considered as the most difficult part of the whole route, and the expense estimated at $275,000. Another canal and lock would be necessary around the falls of Fort Miller; but the remainder of the navigation up the Hudson to Fort Edward does not require any material improvement.

At some distance above Fort Edward, it was intended to connect, by a canal and locks, the Hudson with the North Wood creek, at Fort Ann. The navigation down the creek to Skeensborough is used, but requires to be improved. At this place, where falls render another canal necessary, North Wood creek empties into the south bay of Lake Champlain, and thence is a natural sloop navigation through the whole extent of the lake. The expense of the works from Fort Edward to Skeensborough had been estimated at $200,000.

The funds of the company were insufficient, and have, it is said, been expended without much permanent utility at Stillwater and Skeensborough.

The distance in a straight line from Waterford to Skeensborough is fifty miles; and the expense of opening a permanent boat navigation on a proper plan through the whole line is, from imperfect materials, estimated at about $800,000. This communication would divert to a port of the United States the trade of one-half of the State of Vermont, and of a part of that of New York, which is now principally carried through the channel of the St. Lawrence, and of the province of Canada.

II. Mohawk and Ontario, or Western Navigation.

A company incorporated by the State of New York, for the improvement of this navigation, has made considerable progress, and an accurate survey having been taken of the distances and levels of the greater part of the route, the result will, in the first place, be stated.

	Dist. Miles.	*Fall.* Feet.
From the tide water at Troy to Lansing mills on the Mohawk, is found the greatest impediment to the navigation of that river, consisting of the Cohoes falls, which are seventy feet perpendicular, and of a succession of other falls, which continue to the North river,	4⅜	140
From Lansing mills up the Mohawk to Schenectady, the height of the river, at the time when the survey was taken, prevented Mr. Weston from correctly ascertaining the levels. The fall for that distance is therefore estimated at	12⅓	28¼
From Schenectady to the Little Falls,	57½	110½
The Little Falls, which before the improvements made by the company, interrupted altogether the navigation,	¾	42
From the Little Falls to Fort Stanwix, now Rome,	48	59½
This is the head of the navigation, and the summit level between it and West Wood creek, a branch of Lake Ontario, is nine feet and three quarters above that part of the river Mohawk, where the navigation ceases,	1¼	9¾
	125	390

The whole course of the Mohawk is therefore one hundred and twenty-five miles in length, and the fall through that distance from the summit level to tide water is three hundred and ninety feet.

At the distance of one mile and three quarters is Wood creek, the bed of which is used to its entrance into Lake Oneida, the distance along its meanders being twenty-three miles, but in the line in which a canal might be cut, only fourteen miles, and the fall sixty feet,	14	60
The Oneida forms a natural canal of twenty miles in length, and communicates by the Onondago and Oswego rivers with Lake Ontario. The distance by water down those two rivers to Oswego, on Lake Ontario, is sixty-three miles. The upper part of the navigation is generally good, but the last twelve miles from the Oswego falls, which are not passable, to Lake Ontario, are a continued rapid. The fall from Lake Oneida to Lake Ontario has not been ascertained by actual measurement, but is estimated at one hundred and thirty feet. From Rotterdam, on Lake Oneida, to the mouth of Salmon creek on Lake Ontario, a few miles east of Oswego, the distance is twenty-two miles; and the ground being favorable, it is expected that the line of canal would not exceed twenty-six miles,	20 26	 130
	60	190

The elevation of the summit level between the Mohawk and the waters of Lake Ontario, being only three hundred and ninety feet above the tide water at Troy, and one hundred and ninety feet above Lake Ontario, a canal navigation is practicable the whole distance. Whether this should be attempted for a sloop or boat navigation, must depend principally, if not altogether, on the supply of water. It is stated that the canal from the summit level to Troy must necessarily follow the valley of the Mohawk, and perhaps occasionally enter and cross the river. Calculated for a boat navigation the expense may be estimated as follows:

Mr. Weston estimated the expense of a canal, from Lansing mills to tide water at Troy, around the Cohoes falls, at	$250,000
The distance from the summit level to Lansing mill is 120 miles, and to Lake Ontario, deducting the twenty miles occupied by Lake Oneida, forty miles, together one hundred and sixty miles of canal, the digging of which, at $8000 a mile, is	1,280,000
The fall from the summit level to Lansing mills is two hundred and fifty feet, and to Lake Ontario, one hundred and ninety feet, together four hundred and forty feet lockage, which will require fifty-five locks of eight feet lift each. These at $7,500, the cost of the stone locks erected by the company at the Little Falls, will cost about	420,000
Feeders and aqueducts may be estimated at	250,000
Making altogether two millions two hundred thousand dollars,	2,200,000

It is not believed that a sloop navigation, if practicable, could be effected for a less sum than five millions of dollars. The following works have already been completed by the company:

At the Little Falls a canal, three-quarters of a mile in length, has been opened, and a descent of 42 feet effected by six locks of solid masonry, each of which is 70 feet long, and 12 feet wide. At the German flats, four miles above the Little Falls, another canal, one mile in length, with two stone locks of the same materials and dimensions, effects a descent of ten feet.

On the summit level a canal one mile and three quarters in length, and supplied with water from the river Mohawk by a short feeder, unites that river and Wood creek by means of two locks of the same dimensions and materials, one at each extremity of the canal. All those canals are two feet and a half deep, twenty-four wide at bottom, and thirty-two at top, and admit boats of ten tons. It is proper to state, that at first wooden locks had been erected at the Little Falls, and brick locks on the summit canal. At both places, they had become totally unfit for service at the end of seven years, and it was necessary to replace them by stone locks—a circumstance which increased considerably the expense of the undertaking.

Several minor improvements have been made on the Mohawk, and the navigation of Wood creek, of which the principal defect is want of water, has been improved by raising dams, and by the erection of four temporary wooden locks; but until a canal shall have been opened the whole distance from the summit level to Lake Oneida, the navigation will be imperfect and the profits inconsiderable.

The funds of the company do not enable them to undertake the necessary improvements at the two extremities of the line, a canal around the Cohoes Falls to tide water, and another canal from Lake Oneida to Lake Ontario. The usual portage at the first place is from Schenectady to Albany, and a very good and expensive artificial road of sixteen miles, made by another company, unites the two towns. Another company has lately been incorporated

for the purpose of making an artificial road at the other extremity of the line from Rotterdam, on Lake Oneida, to Salmon Creek, on Lake Ontario.

The capital of the company is two hundred and thirty-two thousand dollars, of which the State of New York owns ninety-two thousand. But, with the exception of one dividend of three per cent., all the tolls have been applied to the works; and, including these, and a debt of twenty thousand dollars due by the company, the whole expenditure amounts to three hundred and seventy thousand dollars. The annual tolls do not yet exceed thirteen thousand dollars.

III. Niagara.

The fall from Lake Erie to Lake Ontario has already been stated at four hundred and fifty feet. A company had also been incorporated by the State of New York for the purpose of opening a canal at this place; but it does not appear that any thing ever was attempted after the survey had been made. The intention seems to have been to open a canal navigation for boats only from Fort Schlosser to Devil's Hole; the lake itself and Giles's creek would have supplied the water, and the expense was estimated at four hundred and thirty-seven thousand dollars.

It is, however, evident that the canal, in order to be as eminently useful as the nature of the undertaking seems to require, should be on such scale as to admit vessels which can navigate both lakes. Considering the distance which in that case must be extended to about ten miles, and the lockage of four hundred and fifty feet, it is not believed that the expense can be estimated at less than one million of dollars.

The works necessary to effect water communications between the tide water of the North river, the St. Lawrence, and all the lakes, (Lake Superior only excepted,) are, therefore, estimated at four millions of dollars, viz:

Northern navigation to Lake Champlain,	$800,000
Western navigation to Lake Ontario,	2,200,000
Falls of Niagara for a sloop navigation,	1,000,000
	$4,000,000

The papers relative to these communications will be found under the letter B. But their utility will not be confined to the extensive navigation of the lakes themselves: for the mountains being completely turned when arrived into Lake Erie, the ridge which separates the waters emptying into that and into Lake Michigan, from the northern branches of the Ohio, and from the waters of the Mississippi, is of a moderate elevation, and is gradually depressed in its course westwardly. There is no doubt of the practicability of opening canals, at a future period, between several of those waters, either by selecting proper levels, or by means of short tunnels across favorable parts of the ridge. It will at present be sufficient to point out the principal communications now in use.

The distance from Lake Erie to Lake Chetoughe, an extensive and important and elevated reservoir which is the source of the Canowango, a branch of the Allegany, is seven miles by a continual ascent, the elevation of which is not ascertained.

From Presque Isle, on Lake Erie, to Le Bœuf, on French creek, another branch of the Allegany, the distance is sixteen miles, and a company is incorporated by the State of Pennsylvania for making an artificial road across that portage.

The navigation from Lake Chetoughe and from Le Bœuf to Pittsburg offers no impediment whenever the waters are high; and the greater part of the salt now consumed in the northwest counties of Pennsylvania, as far as Pittsburg, and some distance down the Ohio, is brought from the salt springs of New York by Oswego, through Lake Ontario; thence across the portage of Niagara to Lake Erie; and thence, by either of the two last mentioned portages, to the waters of the river Allegany.

The distance from the place where the Cayuga, a river emptying into Lake Erie, ceases to be navigable, to the navigable waters of the Muskingum, which empties into the Ohio one hundred and seventy miles below Pittsburg, is only six miles; and a company is said to be formed for the improvement of that communication.

Sandusky river and the Scioto take their sources in the same swamp. The navigation of the Miami of Lake Erie is interrupted by some falls; but its upper branches approach those of the Miami of the Ohio, and of the Wabash, and are stated as being nearly on the same level.

The Illinois river, which empties into the Mississippi above St. Louis, rises in a swamp, which, when the waters are high, affords a natural canoe navigation to the sources of Chicago creek, a short stream, which falls into Lake Michigan at its southern extremity.

Another communication generally used by the Indian traders is that from Green bay, also in Lake Michigan, to the Mississippi by Fox river and the Wisconsin. Nor is there any doubt that, if the inland navigation between the North river and the lakes was completely opened, the whole Indian trade either of the Mississippi by Lake Michigan, or of the northwest by Lake Superior, must necessarily centre in an Atlantic port of the United States—a consideration of minor importance as a commercial object, when compared with the other advantages of that great communication, but of great weight in its relation to the political intercourse of the United States with the Indians.

Interior Canals.

Under this denomination will be included all the canals of which any knowledge has been obtained, and which are not immediately on the rivers opening communications with the Western waters or with those of the St. Lawrence, although some of them may be considered as extending those communications to more remote sea-ports. The documents, from which the information is extracted, will be found under the letters C c.

I. Merrimack.

The navigation of that river, which, rising in the State of New Hampshire, falls into the sea at Newburyport, after a course of one hundred and eighty miles, is interrupted by several falls. A canal, called Blodget's canal, has been opened around Asmoskeag falls; lower down, and about forty miles from the sea, the Essex canal, four miles in length, and admitting boats drawing three feet and a half, will open a communication around the Patucket falls, effecting, through three locks, a descent of thirty-four feet. From the lower extremity of the canal, the river is navigable to the head of the tide at Haverhill, although the fall be forty-five feet within that distance. No particular account has been received of the capital expended, but it is believed that the work will be profitable to the undertakers.

The Middlesex canal, uniting the waters of that river with the harbor of Boston, is, however, the greatest work of the kind which has been completed in the United States.

That canal, 12 feet wide and 3½ feet deep, draws its supply of water from Sudbury or Concord river, a branch of the Merrimack, and, from the summit ground, extends six miles, with a descent of 28 feet, to the Merrimack above the Patucket falls, and 22 miles, with a descent of 107 feet, to the tide water of the harbor of Boston. The descent to the Merrimack is effected by three, and that to the tide water, by nineteen locks. They are all 90 feet long, 12 feet wide, of solid masonry and excellent workmanship.

In order to open that canal, it was necessary to dig in some places at the depth of 20 feet, to cut through ledges of rocks, to fill some valleys and morasses, and to throw several aqueducts across the intervening rivers. One of these across the river Shawshine, is 280 feet long, and 22 feet above the river. All those obstacles have been overcome, and boats of 24 tons, 75 feet long, and 11 feet wide, can navigate the canal. Those in most general use are of smaller dimensions, and are drawn by two horses at the rate of three miles an hour. A raft of one mile in length, and containing 800 tons of timber, has been drawn by two oxen, part of the way, at the rate of one mile an hour. Common boats pass from one end of the canal to the other in twelve hours. The capital expended on the work is stated at $478,000, and the water-rights and necessary land cost a further sum of $58,000; the total expense has exceeded $550,000. The tolls have never yet exceeded $17,000 a year, but are increasing.

Several other canals have been contemplated in the State of Massachusetts, intended to unite the waters of Providence or Pawtucket river, with those of Charles river, which falls into the harbor of Boston, and of the river Connecticut. The grounds have been surveyed, but no particular description has been obtained, and the works have not yet been commenced.

II. Schuylkill and Delaware.

A company was incorporated several years ago, by the State of Pennsylvania, for opening a canal from Norristown, on the river Schuylkill, to the tide water of the Delaware at Philadelphia. The distance is 16 miles, the fall 53 feet, and the canal, deriving its water from the Schuylkill, would have been carried on a level to Philadelphia, and, in its descent to the Delaware, supplied the city with water, and the shipping with docks. The expense had been estimated at $533,000; the work was commenced, one-third part of the digging effected, and a considerable sum expended; but, either from want of funds, or from an improper selection of the ground, or from other causes, not fully understood, the undertaking, if not altogether abandoned, has been suspended for several years.

This canal was intended as the first link of an extensive western communication. The Schuylkill from Norristown to Reading, 46 miles higher up the river, being navigable a great portion of the year, was considered as the next link.

III. Schuylkill and Susquehannah.

Another company was incorporated for the purpose of opening an inland navigation between Reading, on the Schuylkill, to Middletown on the Susquehannah. Both towns are in the great limestone valley, beyond the Blue Ridge, and the distance is 70 miles. It had been at first supposed that it would be sufficient to cut a canal four miles in length, on the summit level, between the two rivers, and thereby to unite the Tulpehocken, which falls into the Schuylkill, with the Quitipahilla, a branch of the Swatara, which empties into the Susquehannah. But it was soon ascertained that the original plan of improving, by a succession of dams, the navigation of those small rivers was erroneous, and that it would be necessary to cut a canal the whole way.

The summit level is at an elevation of 310 feet above the Schuylkill, and of 308 feet above the Susquehannah. Adjacent springs are considered sufficient for the upper locks, and the creeks would, after a short descent, afford an abundant supply. The proposed dimensions of the canal were, a breadth of 20 feet at the bottom, and a depth of 3½ feet, and the expense was estimated at near $1,500,000.

The work was commenced; the canal has been cut the whole distance of four miles on the summit level; five locks, made of brick, have been constructed; land and water-rights have been purchased, and a considerable capital has been expended. But although the State of Pennsylvania has permitted the company to raise $266,000, by lottery, and is bound to pay to them $300,000 whenever the work shall have been completed, it remains suspended for want of funds.

The great lockage necessary for this canal is the principal objection to that line of communication; and it has been suggested that a canal from Columbia, on the Susquehannah, to tide water, or to the great Delaware and Chesapeake canal, would be much less expensive, and equally beneficial, both to the interior country and to Philadelphia. This question, as many others suggested in this report, cannot be decided by any but practical and skilful engineers.

IV. Appomattox.

A company has been incorporated for opening a canal from the upper end of the falls of that river, which is the south branch of James river, to Petersburg on the head of the tide. The distance is five miles, and the descent more than 30 feet, to a basin about 60 feet above the tide, in which the canal will terminate. The water is drawn from the river; and the canal, 16 feet wide, 3 feet deep, and admitting boats of 6 tons, is nearly completed. The capital already expended amounts to $60,000; but the company own thirty negroes, and suppose that their labor, and a further sum of $10,000, will be sufficient to build the locks, and to dig about half a mile, which remains to be cut in order to open the communication between the river and the basin. This work, which has been carried on with much zeal, and at a small expense, will open an important navigation of near 100 miles.

V. Neuse and Beaufort.

The harbor of Beaufort, in North Carolina, and which must not be confounded with that of the same name in South Carolina, admits vessels drawing 18 feet of water. Ocracoke inlet, the only navigable entrance into the Pamlico and Albemarle sounds, that extensive estuary of the rivers Chowan, Roanoke, Tar, and Neuse, has less water, and is seventy miles from Newbern, on the last mentioned river. The distance between Newport or Beaufort river and the Neuse being only three miles, and the elevation of the highest intervening ground no more than seven feet above tide water, a canal, uniting the two rivers, was undertaken by a company incorporated for that purpose by the State of North Carolina. All the shares have, from particular circumstances, become the property of one individual; and the work, which had been commenced some years ago, is now suspended.

VI. Cape Fear River.

A company, incorporated by the same State for improving the navigation of this river, after having exhausted a portion of their funds, which did not exceed $12,000, in fruitless attempts to improve the natural navigation of the river, have opened a canal with a lock, which opens a safe passage around the Buckhorn or Great Falls, seven

miles below the junction of the Deep and Haw rivers. Another canal, six miles in length, with two locks, is necessary, around Smilie's falls. Nearly half that distance has been completed; but the work is now suspended for want of funds. The Legislature has lately authorized the company to increase their capital.

VII. New Orleans.

The canal Carondelet, which has already been mentioned, extends from Bayou St. John to the fortifications or ditch of the city, and thereby opens an inland communication with Lake Pontchartrain. A company is incorporated by the Territorial Legislature, for the purpose of repairing and improving that work, and of uniting the canal, by locks, with the Mississippi. Independent of other advantages, this undertaking would enable Government to transport with facility, and use the same naval force for the defence of both the Mississippi and Lake Pontchartrain, the two great avenues by which New Orleans may be approached from the sea.

TURNPIKE, OR ARTIFICIAL ROADS.

A great number of artificial roads have been completed in the eastern and middle States, at an expense varying from less than $1,000 to $14,000 a mile. The labor bestowed on the least expensive species consists in shortening the distance, diminishing the ascent of hills, removing rocks, levelling, raising, and giving a proper shape to the bed of the roads, draining them by ditches, and erecting bridges over the intervening streams. But the natural soil of the road is used, instead of covering it with a stratum of gravel or pounded stones.

It appears, by one of the papers marked D., under which letter will be found all the information which has been obtained respecting roads, that fifty turnpike companies have been incorporated since the year 1803, in the State of Connecticut alone; and that the roads undertaken by those companies are all of that description. Thirty-nine of those roads, extending together 770 miles, are completed. The most expensive is that from New Haven to Hartford, which has cost $79,261; or, the distance being 34¾ miles, at the rate of $2,280 a mile; but about $18,000 of the capital have been expended in the purchase of the land through which the road is carried. The nett income on this road, deducting the annual repairs and expenses, from the annual tolls, does not exceed $3,000. Of six of the roads which, together, extend 120 miles, no account has been received. The other thirty-two extend, together, 615 miles, and have cost only $340,000; or, on an average, at the rate of $550 a mile; and it seems that the aggregate of annual tolls on the whole is $86,000; from which, deducting the annual repairs and expenses, amounting to $48,000, leaves a nett income of $38,000, or of about 11 per cent. on the capital expended.

No particular account has been received of the roads in the other eastern States, but it is known that besides some of a similar description with those of the State of Connecticut, several of a more expensive kind have been completed, particularly in Massachusetts. The cost has varied from $3,000 to $14,000 a mile, and amongst artificial roads of the first grade may be mentioned those from Boston to Providence, to Salem and to Newburyport. These are all covered with an artificial stratum of gravel or pounded stones, and finished in the most substantial manner. Great expense has also been incurred, in order to shorten the distance without exceeding the angle of ascent, which is fixed at five degrees; and it is stated that the road to Newburyport, thirty-two miles in length, and in which marshes and rocks presented considerable obstacles, has cost $400,000, or at the rate of $12,500 a mile. Those expensive roads, however useful and permanent, appear to be much less profitable than those of Connecticut. The Salem road is said to yield six per cent.; another road has been stated as yielding eight per cent. The income of all the others in the State of Massachusetts is said not to exceed on an average three per cent.; and that of the road from Boston to Newburyport amounts to no more than two per cent.

A greater capital has been vested in turnpike roads in the State of New York than in any other. In less than seven years sixty-seven companies have been incorporated, with a nominal capital of near $5,000,000, for the purpose of making more than three thousand miles of artificial roads; and twenty-one other companies have also been incorporated with a capital of $400,000, for the purpose of erecting twenty-one toll-bridges. Although no particular account has been received either of the capital actually expended of the annual amount of tolls, or of the materials of the roads, it is known that great progress has been made; and it has been stated that nine hundred miles of road were already completed by twenty-eight companies, whose capital amounted to $1,800,000, and who had two hundred miles more of road to finish.

Those roads extend in every direction, but particularly from every town or village on the North river, westwardly and northwestwardly towards the waters of the Susquehannah and those of the great lakes. The most expensive is that from Albany to Schenectady, fourteen miles long, and which has cost at the rate of $10,000 a mile. Near one hundred and forty miles of roads extending westwardly from Albany and Schenectady, appear to have cost at the rate of $2,500 or $3,000 a mile. The expense of all the others does not seem, on an average, to exceed $1,250 a mile.

More detailed information has been obtained respecting the roads in New Jersey, Pennsylvania, and Maryland.

In New Jersey a turnpike road has lately been completed from Trenton to Brunswick. The distance is twenty-five miles; the greatest angle of ascent, three degrees; and the road is nearly in a straight line, the only considerable obstruction being the "sand hills," through which it was necessary to dig at the depth of thirty feet, in order not to exceed the angle of ascent. The road is thirty-six feet wide, fifteen feet of which are covered with about six inches of gravel. A few wooden bridges, with stone abutments, and piers have been erected across the intervening streams. The whole expense is stated at $2,500 a mile. From Brunswick the road will be extended to Elizabethtown, and the work is now progressing. Another road has been undertaken in the same State from Brunswick to Easton on the river Delaware. The distance is forty-three miles, of which eleven have been completed at an expense of $40,000. This road will be more expensive than the preceding, both on account of the ground, the bridges being more numerous, and the Blue Ridge (Musconekong mountain) intervening, and because a more substantial facing or greater thickness of gravel is requisite. The funds of the company are exhausted.

In Pennsylvania artificial roads of the most substantial kind have been completed or are progressing from Philadelphia in sundry directions.

The principal are to Bristol and Trenton, twelve miles of which are completed; to Germantown and Perkioman, with two branches to Willow Grove and to Chesnut Hill; and to Lancaster and Columbia, with a branch to Harrisburg.

The distance from Philadelphia to Perkioman is twenty-five miles and a quarter; the two branches extend one ten miles, and the other seven miles and a half; making together near forty-three miles. The angle of ascent is our degrees; the breadth of the road fifty feet, of which twenty-eight feet, having a convexity of fifteen inches, are

covered with a stratum either of gravel eighteen inches thick, or of pounded stones twelve inches thick. One-half of the stones forming the lower part of the stratum are broken into pieces not more than five inches in diameter; the other half, or upper part of the stratum consists of stones broken into pieces not more than two inches and a half in diameter, and this difference in the size of the stones is represented as a considerable defect. Side or summer roads extend on each side of the gravel or stone road. The five miles next to Philadelphia have cost at the rate of $14,517 a mile; the other twenty miles and a half at the rate of $10,490 a mile. Yet there were no natural impediments, and only small bridges or culverts were necessary. The capital expended on these twenty-five miles and a half is $285,000; the tolls amount to $19,000; the annual repairs and expenses to $10,000; the nett income to about $9,000, or little more than 3 per cent. on the capital expended.

The distance from the Schuylkill at Philadelphia to Lancaster is sixty-two miles and a quarter; exclusively of the side or summer roads twenty-four feet of the bed of the road are covered with a stratum of pounded stones, eighteen inches thick in the middle of the road, and decreasing each way to twelve inches. The valley hills are the most elevated and steep on the road; but the angle of ascent no where exceeds four degrees. Stone bridges have been erected across all the intervening streams. That across the river Conestogo, consisting of nine arches, is private property; and the most expensive built by the company is that across the Brandywine, consisting of three arches of solid masonry, and which cost $12,000. The capital of the company amounted to $360,000; but this being insufficient, it became necessary to apply a considerable portion of the tolls to the completion of the work. The whole expense amounts to $465,000, or at the rate of about $7,500 a mile. The annual tolls have not yet exceeded $25,000, and the annual repairs and expenses are estimated at $13,000, leaving a nett income of about $12,000. The prospect of an increased profit, derived from the proposed extension of the road has, however, raised the price of that stock nearly to par.

The Lancaster road, the first extensive turnpike that was completed in the United States is the first link of the great Western communication from Philadelphia. It has been extended ten miles westwardly to Columbia on the Susquehannah, and another branch is now progressing northwestwardly to Harrisburg, also on the Susquehannah, and thirty-six miles from Lancaster. The State of Pennsylvania has also incorporated two companies in order to extend the road by two different routes as far as Pittsburg on the Ohio, and near three hundred miles from Philadelphia. The southern route following the main post road passes by Bedford and Somerset. The northern route passes by Huntingdon and Frankstown, the highest point to which the Juniata branch of the Susquehannah is navigable. To this route the State has authorized a subscription of $100,000.

Other roads in a northwest direction from Philadelphia towards the Genesee, and Presque Isle on Lake Erie, are also progressing, and have been encouraged by the subscriptions or donations of the Legislature. They are generally on a much less expensive plan than those in the direction of Pittsburg. A section of thirty miles from Lausanne on the Lehigh to Nescopeck on the Susquehannah has been completed at the expense of $36,000 by a company; and it is intended to extend it seventy miles further to Newton on the Tioga branch of the Susquehannah.

In Maryland, roads extending from Baltimore in various directions have lately been undertaken by several companies, and are rapidly progressing. On the falls turnpike, which extends, in a northerly direction, about four miles of a road twenty-two feet wide, covered with a stratum of pounded stones ten inches thick, and having an ascent not exceeding four degrees, have been completed at the rate of $7,500 a mile.

The "Reistertown" turnpike, in a northwestwardly direction, extends sixteen miles to that village, whence two branches, extending one nineteen, and the other twenty-nine miles further, will enter Pennsylvania at two different places. The road, twenty-four feet wide, is covered with a stratum twelve inches thick of pounded stones not more than three inches in diameter. The angle of ascent does not exceed three degrees and a half. Ten miles have been completed at the expense of $10,000 a mile, and the work is progressing. The capital of the company amounts to $420,000.

The capital of the "Fredericktown" turnpike company amounts to $500,000, and the company is authorized to open the great western road as far as Boonsborough, beyond the Blue Ridge, and sixty-two miles from Baltimore. The angle of ascent will not exceed four degrees; the road has a convexity of nine inches; and on a breadth of twenty-two feet is covered with a stratum ten inches thick of pounded stones not exceeding three inches in diameter, over which are spread two inches of gravel or coarse sand. The first twenty miles next to Baltimore have cost at the rate of $9,000, and the next seventeen miles are contracted for at the rate of $7,000 a mile.

The distance from Boonsborough to Cumberland, at the foot of the Allegany mountains, following the present road, is seventy-three miles; and, although the company is not yet authorized to extend the turnpike to that place, the ground has been surveyed, and it is ascertained that the road may be continued with an angle of ascent not exceeding four degrees. The ascent of the road laid out by the United States from Cumberland to Brownsville on the Monongahela does not exceed five degrees, and the distance is seventy-two miles; making the whole distance of a turnpike road from Baltimore to the navigable waters of the Ohio two hundred and seven miles.

The distance from the city of Washington to the same spot on the Monongahela is some miles shorter, being, as has already been stated, the shortest communication between tide water and the navigable Western waters.

South of the Potomac, few artificial roads have been undertaken. From Alexandria one is now progressing, in a northwestwardly direction, towards Middleburg. Another has lately been commenced from Richmond to Ross's coal mine; but the only one which, so far as any accounts have been received, is completed, extends twelve miles from Manchester, opposite to Richmond, in a westwardly direction, to the coal mines of Falling creek. This road, thirty-six feet wide, is gravelled, and has cost $50,000; but the last four miles did not cost more than at the rate of $3,000 a mile. Yet it is sufficiently substantial, the route being very level, to admit wagons carrying four tons.

The greater progress made in the improvement of roads in the northern parts of the Union must be principally ascribed to a more compact population, which renders those improvements more necessary, and at the same time supplies with greater facility the means of effecting them. The same difference is perceptible in the number of bridges erected in the several States.

In the Eastern States, and particularly Massachusetts, wooden bridges, uniting boldness to elegance, and having no defect but want of durability, have been erected over the broadest and deepest rivers. In the lower counties of Pennsylvania, stone bridges are generally found across all the small streams. Both in that State and at some distance eastwardly, bridges with stone piers and abutments, and a wooden superstructure, are common over wide rivers. Of these, the most expensive, and which may be considered as the first in the United States, is the permanent Schuylkill bridge near Philadelphia, erected by a company at an expense of $300,000. Its length, including the abutments, does not exceed 750 feet, and it is supported only by two piers and the abutments; but those piers, 195 feet apart, are of the most solid workmanship, and one of them was sunk at a depth of more than 24 feet below low water. The bridge is 42 feet wide, and the wooden superstructure is enclosed and covered with a shingle roof.

The want of bridges south of Pennsylvania, even on the main post road, is sensibly felt. One lately thrown across the Potomac, three miles above the city of Washington, and which, without any intervening piers, is wholly suspended to iron chains, extending from bank to bank, deserves notice on account of the boldness of its construc-

tion, and of its comparative cheapness. The principle of this new plan, derived from the tenacity of iron, seems applicable to all rapid streams of a moderate breadth.

The general principles of improved roads seem to be, 1st, the reduction of hills by diminishing the angle of ascent, which ought not to exceed, whenever practicable, three and a half degrees, and, under no circumstances, five degrees; 2dly, a sufficient convexity in the bed of the road, together with ditches and drains, all which are intended to prevent the injury caused by standing water or freshets; 3dly, an artificial bed of pounded stones or gravel, sufficiently substantial to support the weight of the carriages in general use on the road, either for the conveyance of persons or for the transportation of merchandise.

On the last point, it appears, from the facts already stated or scattered in the communications received on that subject, 1st, that the stones ought to be similar in quality and reduced to the same size, should not exceed three inches in diameter; 2d, that the preferable qualities of stone rank in the following order: hard black stone, granite, flint or quartz, blue limestone, white limestone; 3d, that the stratum may be either of pounded stones, 12 inches thick, or of pounded stones, 10 inches thick, with 2 inches of gravel spread over the stones, or entirely of gravel, 18 inches thick; 4th, that, when the materials are equally convenient, the expense of those three modes will not materially differ, but that the rate of expense depends principally on the number of hills and bridges, distance of materials, breadth of the road, and price of labor; and, 5th, that the general adoption of broad wheels for the transportation of heavy loads is necessary to the full enjoyment of the advantages expected from the most substantial artificial roads. On the degree of convexity, and on the proper shape to be given to the natural bed of the road under the artificial stratum, a diversity of opinions seems to prevail.

The roads heretofore made may be divided into three general classes:

1. Those where the only improvement consists in the reduction of hills, and in the convexity and ditches of the road, whereby the angle of ascent is rendered more easy, and standing water excluded; but where the natural soil is used without any artificial stratum. The expense of these roads may vary according to local circumstances, and the perfection of the work, from five hundred to one thousand dollars per mile. They are most generally in use in the Eastern States, and may be introduced with advantage in all those districts of country where wealth does not admit more expensive improvements, or where the materials of an artificial stratum are altogether wanting. It is only in the last case that they may be considered as a national object; and no other improvement, besides bridges and causeways, is perhaps practicable in the lower country of the southern States. Iron, and even timber rail-roads may, however, be sometimes substituted in those level parts of the country where stones and gravel are not to be found.

2. Roads prepared as above, of a reduced breadth, and covered with a thin coat of gravel not more than six or nine inches thick; such as the turnpike lately made between Trenton and Brunswick. These roads, the expense of which may be estimated at about three thousand dollars a mile, may be used wherever the frost does not materially affect them, and in every climate where they are intended principally for the conveyance of persons, and not for the transportation of heavy loads.

3. The artificial roads of the best construction, such as have been already described. These, when not exceeding twenty-two feet in breadth, and except in the vicinity of large cities, will cost at the rate of seven thousand dollars a mile, exclusively of bridges over large rivers; and they must be resorted to whenever a *commercial* road for heavy transportation is intended, particularly in the Middle States, or rather in the United States, between 41 and 36 degrees of north latitude. North of the 41st degree, the snow lies generally during the whole winter; and the great bulk of heavy transportation is effected in sleighs during that season. There is, therefore, less necessity for using the roads in the spring; and they are also better protected against the effects of the frost by the snow. South of the 36th degree, which in the Atlantic States may be considered as the boundary of the great cotton cultivation, the frost does not materially injure the roads. It is between those two extremes that the most substantial are required; and it also happens that the great land communications with the western country, which considerably increase the amount of transportation, are principally within the same limits.

The same principles which have directed the arrangement adopted in this report in relation to canals, will also point out those roads which seem, in the first instance, to claim the patronage of the General Government.

Those which appear most necessary for the communications between the Atlantic and western rivers have already been mentioned under that head; and the improvement of the water communication between the North river and the great lakes ought to take the precedence of any other in that direction.

That road which, therefore, seems exclusively to claim public attention, is a great turnpike extending from Maine to Georgia in the general direction of the seacoast and main post road, passing through all the principal seaports. The general convenience and importance of such a work, are too obvious to require any comments; and the expense seems to be the primary object of consideration.

The distance will be roughly estimated at one thousand six hundred miles; and from what has been stated on the subject of roads generally, it may be inferred that the greater part of the road being intended almost exclusively for travelling, and not for transportation of heavy articles, the expense cannot exceed the rate of three thousand dollars a mile. For although some detached portions of the route being commercial roads, must be improved as such, and at a greater expense; an equivalent reduction in other parts will result from those portions which are already improved by private companies, and from the impossibility, for want of materials for an artificial stratum, of going in some places beyond what has been described as the first or cheapest species of turnpike. The whole expense may, therefore, be estimated at $4,800,000. A secondary object, but of more importance to Government than to individuals, would be the improvement, on a much less expensive scale, of certain portions of roads leading to some points on the extremes of the Union, intended principally for the purpose of accelerating the progress of the mail, and the prompt transmission of information of a public nature. The points contemplated are Detroit, St. Louis in Upper Louisiana, and New Orleans. The portions of road which, traversing a wilderness cannot be improved without the aid of the United States, are, from the Tuscarora branch of the Muskingum to Detroit; from Cincinnati, by Vincennes, to St. Louis; and from Nashville in Tennessee, or Athens in Georgia, to Natchez. The expense necessary to enable the mail and even stages to proceed at the rate of eighty miles a day, may, at the rate of about two hundred dollars a mile, including bridges over all the small streams, be estimated, for those three roads, at two hundred thousand dollars.

RECAPITULATION AND RESOURCES.

The improvements which have been respectfully suggested as most important in order to facilitate the communication between the great geographical divisions of the United States, will now be recapitulated; and their expense compared with the resources applicable to that object.

I. From north to south, in a direction parallel to the seacoast.		
1. Canals opening an inland navigation for sea vessels from Massachusetts to North Carolina, being more than two-thirds of the Atlantic seacoast of the United States, and across all the principal capes, Cape Fear excepted,	$3,000,000	
2. A great turnpike road from Maine to Georgia along the whole extent of the Atlantic seacoast,	4,800,000	
		$7,800,000
II. From east to west, forming communications across the mountains between the Atlantic and western rivers.		
1. Improvement of the navigation of four great Atlantic rivers, including canals parallel to them,	1,500,000	
2. Four firstrate turnpike roads from those rivers across the mountains, to the four corresponding western rivers,	2,800,000	
3. Canal around the falls of the Ohio,	300,000	
4. Improvement of roads to Detroit, St. Louis and New Orleans,	200,000	
		4,800,000
III. In a northern and nortwestwardly direction, forming inland navigations between the Atlantic seacoast, and the great lakes and the St. Lawrence.		
1. Inland navigation between the North river and Lake Champlain,	800,000	
2. Great inland navigation opened the whole way by canals from the North river to Lake Ontario,	2,200,000	
3. Canal around the falls and rapids of Niagara, opening a sloop navigation from Lake Ontario to the upper lakes as far as the extremities of Lake Michigan,	1,000,000	
		4,000,000
Making, together,		$16,600,000

IV. The great geographical features of the country have been solely adhered to in pointing out those lines of communication; and these appear to embrace all the great interests of the Union, and to be calculated to diffuse and increase the national wealth in a very general way, by opening an intercourse between the remotest extremes of the United States. Yet it must necessarily result from an adherence to that principle, that those parts of the Atlantic States through which the great western and northwest communications will be carried, must, in addition to the general advantages in which they will participate, receive from those communications greater local and immediate benefits than the Eastern and perhaps Southern States. As the expense must be defrayed from the general funds of the Union, justice, and, perhaps, policy not less than justice, seems to require that a number of local improvements, sufficient to equalize the advantages, should also be undertaken in those States, parts of States, or districts which are less immediately interested in those inland communications. Arithmetical precision cannot, indeed, be attained in objects of that kind; nor would an apportionment of the moneys applied according to the population of each State be either just or practicable, since roads and particularly canals are often of greater utility to the States which they unite, than to those through which they pass. But a sufficient number of local improvements, consisting either of roads or canals may, without any material difficulty, be selected, so as to do substantial justice and give general satisfaction. Without pretending to suggest what would be the additional sum necessary for that object, it will, for the sake of round numbers, be estimated at - $3,400,000

Which, added to the sum estimated for general improvements, - 16,600,000

Would make an aggregate of - $20,000,000

An annual appropriation of two millions of dollars would accomplish all those great objects in ten years, and may, without inconvenience, be supplied in time of peace by the existing revenues and resources of the United States. This may be exemplified in several ways.

The annual appropriation, on account of the principal and interest of the public debt, has, during the last six years, amounted to eight millions of dollars. After the present year, or, at furthest, after the ensuing year, the sum which, on account of the irredeemable nature of the remaining debt, may be applied to that object cannot, in any one year, exceed four million six hundred thousand dollars; leaving, therefore, from that source alone, an annual surplus of three million four hundred thousand dollars applicable to any other object.

From the 1st January, 1801, to the 1st January, 1809, a period of eight years, the United States shall have discharged about thirty-four millions of the principal of the old debt, or deducting the Louisiana debt incurred during the same period and not yet discharged, about twenty-three millions of dollars. They may, with equal facility, apply, in a period of ten years, a sum of twenty millions of dollars to internal improvements.

The annual permanent revenue of the United States, calculated on a state of general peace, and on the most moderate estimate, was, in a report made to Congress on the 6th day of December, 1806, computed for the years 1809, 1815, at fourteen millions of dollars. The annual expenses on the peace establishment, and including the four million six hundred thousand dollars on account of the debt, and four hundred thousand dollars for contingencies, do not exceed eight millions and a half, leaving an annual surplus of five millions and a half of dollars. To provide for the protection and defence of the country is undoubtedly the object to which the resources of the United States must, in the first instance, be applied, and to the exclusion of all others, if the times shall require it. But it is believed that, in times of peace, and to such period only are these remarks applicable; the surplus will be amply sufficient to defray the expenses of all the preparatory measures of a permanent nature which prudence may suggest, and to pay the sum destined for internal improvements. Three millions annually applied during the same period of ten years, would arm every man in the United States, fill the public arsenals and magazines, erect every battery and fortification which could be manned, and even, if thought eligible, build a navy. That the whole surplus would be inadequate to the support of any considerable increase of the land or naval force kept in actual service in time of peace, will be readily admitted. But such a system is not contemplated; if ever adopted, the objects of this report must probably be abandoned; for it has not heretofore been found an easy task for any Government to indulge in that species of expense, which, leaving no trace behind it, adds nothing to the real strength of the country, and, at the same time, to provide for either its permanent defence or improvement.

It must not be omitted that the facility of communications constitutes, particularly in the United States, an important branch of national defence. Their extensive territory opposes a powerful obstacle to the progress of an enemy; but, on the other hand, the number of regular forces which may be raised, necessarily limited by the

population, will, for many years, be inconsiderable when compared with that extent of territory. That defect cannot otherwise be supplied than by those great national improvements, which will afford the means of a rapid concentration of that regular force, and of a formidable body of militia on any given point.

Amongst the resources of the Union, there is one which, from its nature, seems more particularly applicable to internal improvements. Exclusively of Louisiana, the General Government possesses, in trust for the people of the United States, about one hundred millions of acres fit for cultivation, north of the river Ohio, and near fifty millions south of the State of Tennessee. For the disposition of these lands a plan has been adopted, calculated to enable every industrious citizen to become a freeholder, to secure indisputable titles to the purchasers, to obtain a national revenue, and, above all, to suppress monopoly. Its success has surpassed that of every former attempt, and exceeded the expectations of its authors. But a higher price than had usually been paid for waste lands by the first inhabitants of the frontier became an unavoidable ingredient of a system intended for general benefit, and was necessary, in order to prevent the public lands being engrossed by individuals possessing greater wealth, activity, and local advantages. It is believed that nothing could be more gratifying to the purchasers, and to the inhabitants of the Western States generally, or better calculated to remove popular objections, and to defeat insidious efforts, than the application of the proceeds of the sales to improvements conferring general advantages on the nation, and an immediate benefit on the purchasers and inhabitants themselves. It may be added, that the United States, considered merely as owners of the soil, are also deeply interested in the opening of those communications which must necessarily enhance the value of their property. Thus the opening an inland navigation from tide water to the great lakes, would immediately give to the great body of lands bordering on those lakes as great value as if they were situated at the distance of one hundred miles by land from the seacoast. And if the proceeds of the first ten millions of acres which may be sold were applied to such improvements, the United States would be amply repaid in the sale of the other ninety millions.

The annual appropriation of two millions of dollars drawn from the general revenues of the Union, which has been suggested, could operate to its full extent only in times of peace and under prosperous circumstances. The application of the proceeds of the sales of the public lands, might, perhaps, be made permanent until it had amounted to a certain sum, and until the most important improvements had been effected. The fund created by those improvements, the expense of which has been estimated at twenty millions of dollars, would afterwards become itself a perpetual resource for further improvements. Although some of those first communications should not become immediately productive; and although the same liberal policy, which dictated the measure, would consider them less as objects of revenue to Government, than of increased wealth and general convenience to the nation, yet they would all, sooner or later, acquire, as productive property, their par value. Whenever that had taken place in relation to any of them, the stock might be sold to individuals or companies, and the proceeds applied to a new improvement. And by persevering in that plan, a succession of improvements would be effected until every portion of the United States should enjoy all the advantages of inland navigation and improved roads, of which it was susceptible. To effect that great object, a disbursement of twenty millions of dollars, applied with more or less rapidity, according to the circumstances of the United States, would be amply sufficient.

The manner in which the public moneys may be applied to such objects remains to be considered.

It is evident that the United States cannot, under the constitution, open any road or canal, without the consent of the State through which such road or canal must pass. In order, therefore, to remove every impediment to a national plan of internal improvements, an amendment to the constitution was suggested by the Executive when the subject was recommended to the consideration of Congress. Until this be obtained, the assent of the States being necessary for each improvement, the modifications under which that assent may be given, will necessarily control the manner of applying the money. It may be, however, observed that in relation to the specific improvements which have been suggested, there is hardly any which is not either already authorized by the States respectively, or so immediately beneficial to them, as to render it highly probable that no material difficulty will be experienced in that respect.

The moneys may be applied in two different manners. The United States may, with the assent of the States, undertake some of the works at their sole expense, or they may subscribe a certain number of shares of the stock of companies incorporated for the purpose. Loans might also, in some instances, be made to such companies. The first mode would, perhaps, by effectually controlling local interests, give the most proper general direction to the work. Its details would probably be executed on a more economical plan by private companies. Both modes may, perhaps, be blended together so as to obtain the advantages pertaining to each. But the modifications of which the plan is susceptible must vary according to the nature of the work, and of the charters, and seem to belong to that class of details which are not the immediate subject of consideration.

At present the only work undertaken by the United States at their sole expense, and to which the assent of the States has been obtained, is the road from Cumberland to Brownsville; an appropriation may, for that purpose, be made at any time. In relation to all other works, the United States have nothing at this time in their power but to assist those already authorized, either by loans, or by becoming stockholders; and the last mode appears the most eligible. The only companies incorporated for effecting some of the improvements, considered in this report as of national and firstrate importance, which have applied for such assistance, are the Chesapeake and Delaware Canal, the Susquehannah Canal, and the Dismal Swamp companies; and authority might be given to subscribe a certain number of shares to each on condition that the plan of the work to be executed should be approved by the General Government. A subscription to the Ohio Canal, to the Pittsburg Road, and perhaps to some other objects not fully ascertained, is also practicable at this time. As an important basis of the general system, an immediate authority might also be given to take the surveys and levels of the routes of the most important roads and canals which are contemplated: a work always useful, and by which the practicability and expense of the undertakings would be ascertained with much more correctness than in this report. A moderate appropriation would be sufficient for those several objects.

In the selection of the objects submitted in obedience to the order of the Senate, as claiming, in the first instance, the aid of the General Government, general principles have been adhered to as best calculated to suppress every bias of partiality to particular objects. Yet some such bias, of which no individual is perfectly free, may, without being felt, have operated on this report. The National Legislature alone, embracing every local interest, and superior to every local consideration, is competent to the selection of such national objects. The materials contained in the papers, herewith transmitted, and the information to be derived from surveys taken under the authority of the General Government, will furnish the facts necessary for a correct decision. Two communications by Mr. B. H. Latrobe, and by Mr. Robert Fulton, (marked E and F,) are, in the mean while, respectfully referred to as containing much interesting practical information, connected with observations of a general nature on the subject.

All which is most respectfully submitted.

ALBERT GALLATIN, *Secretary of the Treasury.*

TREASURY DEPARTMENT, *April* 4, 1808.

Queries respecting canals.

1. Points united by canal, and their distance by said canal.
2. Elevation of the highest ground through which canal passes; descent thence to the two extremities; and number of miles where canal is level.
3. Number, dimensions, contents, construction, and situation of locks.
4. Supply of water; whence obtained; its amount reduced to cubic feet per minute, hour, or day; its elevation above the highest point of the canal; length of feeders; situation and contents of reservoirs; what additional resources may be resorted to if the present supply should fall short of the quantity wanted.
5. Designation of such parts of the route where the natural or improved bed of rivers is used.
6. Depth and breadth of canal; burden of vessels; breadth of towing paths.
7. Aqueducts across valleys or rivers; tunnels through hills; bridges across the canal.
8. Particular obstructions and difficulties surmounted or to be encountered.
9. Defects either in the plan or execution, and the proposed remedies.
10. Estimate of the tonnage of vessels; species, weight, and value of the articles annually conveyed by the canal; expense of carriage by canal, compared with land or river carriage before canal was made; time employed in navigating through the whole canal.
11. Capital already expended, vested, or wanted for completing the work.
12. Expenses per mile, and in the whole, and, as far as practicable, of every component part of the work in all its details.
13. Rate and gross amount of tolls; annual expenses of repairs and contingencies; annual nett income.
14. Substance of charters, and acts of Legislature on the subject.

Queries respecting artificial roads.

1. Points united, and their distance.
2. Elevation of the hills over which the road passes; greatest angle of ascent which has been allowed.
3. Breadth, form, materials of the artificial road.
4. Bridges; their dimensions, materials, construction.
5. Particular obstructions and difficulties surmounted or to be encountered.
6. Expenses per mile, and in the whole, and, as far as practicable; of every component part of the work in all its details, viz: forming the bed of the road, cutting hills, quarrying, transporting, breaking, laying stones or gravel, &c.
7. Capital already expended, vested, or wanted for completing the work.
8. Rate, and gross amount of tolls; annual expenses of repairs and contingencies; annual nett income.
9. Substance of charters, and acts of Legislature on the subject.

A. No. 1.

MASSACHUSETTS CANAL.

1. *Back river, in Buzzard's bay, to Scusset river, in Barnstable bay; and,* 2. *Hyannus harbor, south of cape, to Barnstable town, north of cape.*

SIR: CAMBRIDGE, *June* 29, 1791.

In obedience to your excellency's commands, dated 5th May, 1791, I have visited Sandwich and Buzzard's bay, and beg leave to lay before you the following report of my proceedings, and of the state of the isthmus and bay relative to the proposed canal.

On the 12th of May I set out from home, carrying with me the necessary apparatus; but two or three rainy days prevented my getting to Sandwich till the 16th of the month. As soon as I arrived, I applied to Brigadier Freeman for information respecting the proposed course; and he, with Abraham Williams, Esq., very politely spent the two next days in showing me the ground, and procuring the necessary assistants for the survey. On the 19th, I begun at a place called Agawam point, near the southern side of the mouth of Monimet river, proceeded along the shore of Buzzard's bay to the Back river; then up the Back river, and through the Monimet village, to the bridge over the Monimet river; then down the river to comprehend the whole neck lying between those two rivers, which discharge, as your excellency will see by the annexed plan, into Buzzard's bay. We then began at the Monimet bridge, and measured the distance and the course to the head of the Monimet river, or rather Herring brook, as it is called, above where it is usually influenced by the tide. Having ascertained the whole course of this river, we next proceeded along the valley leading to the head of Scusset river, which falls into Barnstable bay, and pursued that valley and the adjacent marsh down to the shore, ascertaining at the same time the course of the river. Bad weather prevented this part of the business from being finished till the 27th of May. Having, on the 28th, completed a plan of the ground and the river, as the spring tides had begun to set in, I endeavored to procure a boat to take the soundings in Buzzard's bay, but could not obtain one till the 31st, when a severe storm prevented me from using it; but a part of the day, notwithstanding the rain, was spent in making the necessary observations for determining the elevations of the ground between Plymouth road and Barnstable bay. The first of June being a fair day, I made the observations necessary for completing the series of elevations over to Buzzard's bay, and took the soundings in the bay as far as the point of Wenormuck neck, which is about a league from the head of the bay, and forms a part of the southern shore. The elevations and soundings are marked upon the plan. The latter are from low water at spring tides, and are measured by feet. The elevations are above the half flood, which is always considered as the level of the sea, or that height at which the water would stand if the tides were to cease.

It being necessary, in order for ascertaining the navigability of the bay, and collecting all those facts and observations, arising from the nature of the country, which are necessary to enable the committee to form a judgment of the practicability and utility of the proposed canal, that intelligence should be obtained near the mouth of the bay, I went to Falmouth on the 2d of June, and returned to Sandwich on the 7th, having, as I supposed, finished all the needful inquiries.

The Monimet neck is generally upland, and gently undulated. Dry ground may be had for the laborers to work upon all the way from the Back river to the Monimet bridge. There are, however, marshes and swamps which accompany the northern branch of this river to its source, which is a mile and a quarter from its mouth. The distance would be shortened by keeping to the upland, but there would be more earth to be removed; while the inconvenience of working in the wet ground, and an exposure to the tides, would be avoided. Whichever course is taken, when we get to the northern head of the Back river, there is no avoiding the hill on which the Monimet village stands. This hill rises about twenty-nine feet from the level of the sea, and the distance from the head of

the Back river to the Monimet bridge is one hundred and forty-five rods, or nearly half a mile. From the Monimet bridge, travelling three furlongs up the river brings us to a small creek, which unites a very extensive swamp to the river. Though the bank of the river rises immediately after passing this creek, yet the swamp occupies the bulk of the space between the river and the road for the length of half a mile. The bottom of the swamp is a black loom, and, like the small marshes on this side of the river, so exceedingly soft as to render it dangerous walking. Even in the upland the inhabitants agree that they are not obliged to sink their wells below the level of the high water mark. In the low land and woods the brush was exceedingly thick, as the leaves were then out, which made it necessary for a man to proceed with an axe, and clear the course for the chain. A considerable stream, by the name of Piggsfield creek, runs from this swamp into Monimet river. Half a mile from the end of the swamp, over cleared land, brings us to a wood, which reaches nearly a mile, to the open ground before Dr. Bourne's, where the Herring brook descends from the north, and turns westwardly towards Buzzard's bay. We pursued the course of it a mile, to where it issues from Herring pond. The country is rough and broken, and generally wooded. The stream is rapid, and is about a rod wide, and a foot deep, where it leaves the pond. The supply of water is sufficient for a mill, while the channel for the waste water furnishes a constant passage for the fish. This large pond is described by the neighboring inhabitants to be two miles and a half long, and from a half to three-quarters of a mile broad. Its magnitude in the plan is taken from their verbal accounts, and its position from my own inspection. The ground about it is so high that there is no idea of running a canal through the pond; but the suggestion that a close canal would be most expedient made it necessary to know whether a sufficiency of water can be had for such a purpose. After the river gets into the valley, and turns westward, it keeps close under the hills on the northern side of the vale, till it comes down to Monimet bridge; and the only ground where it is practicable to make the canal is on the southern side of the river. To begin near the mouth of the Back river is most eligible, on account of the greater depth of water there than off Monimet river. Before coming out of the woods, in our course of survey, the hills come quite to the road, pretty steep, and from the road slope gently to the river, where the bank is high. The road turns to the right, over a sharp hill, to avoid another swamp, which lies detached, and is between the Herring and Scusset rivers. The valley is here only thirty rods wide, and the hills on the southern side of it are connected with the high ranges which fill all this country for several miles, and render it impracticable to turn a canal to the southward of them. Crossing this narrow vale, we took the Wareham road, and pursued it through the woods, steep hills being on the north, and a swamp on the south side of the road, for more than half a mile. After this, the ground was so well cleared, that, from any part of the road to Sandwich, we could command a view of the low grounds and of objects on the other side of the valley quite to the Plymouth road, till the two roads meet, soon after the latter has crossed Scusset river, at a mile and a half from Barnstable bay. This river is accompanied in its whole extent by low, spongy lands, covered with brush, till it comes to the marsh, which is of the same soft texture as the other low ground that we have mentioned, and shakes for several feet round a person walking on it. The bottom of this river is in general muddy, and the stream is small and shallow. At the bridge in Plymouth road, it is a little more than a rod wide, and is six inches deep. Where it crosses the beach it is, indeed, wider, but we found no difficulty in riding through it without a guide; the bottom being there gravel, and the water not more than twelve or fourteen inches deep. The direct course from the bridge to the shore is about a mile and a half, and crosses a high ground distinguished in this neighborhood by the name of Plymouth neck. This hill is joined to the rest of the upland by a low neck, covered with brush, and under no cultivation, as the tide flows over it in severe storms. Though it is above the usual elevation of the spring tides, it would not be sufficient to secure a canal, granting it to be otherwise defended, from being filled by the sea before the workmen could finish it. But the difficulty from the tides is much greater on the other side of the hill, where the river runs through a marsh a quarter of a mile wide, which is bounded on one side by Plymouth neck, and on the other by the beach. The bank is of loose sand, and rises in some places to the height of thirty feet above the level of the sea. On the side towards the marsh it bears a scattering beach grass, not enough to bind the surface, or to conceal the poverty of the soil from the eye of a spectator at a considerable distance. When we rode along the shore previous to the survey, the horses sunk to the fetlock at every step in the dry sand, for two or three miles together. The bank towards the sea is very steep, and without any appearance of vegetation. In several places the violence of the sea has broken the bank, but it is only at the mouth of the river that I observed any opening for the regular tides to overflow the marshes.

After leaving the Plymouth road, the way to the Back river, as commonly travelled, is pretty level. Though the fields at the sides of the road are covered with grass, yet, where the ground has been ploughed, the sand is turned up, and the road itself is generally sandy. The heavy timber has been cut off, and is supplied by a growth of small trees. In some parts of the way are many loose stones proper for building of fences; but I did not observe any large beds of rock. It is said, however, that there are some in the neighboring hills. In two places the narrowness of the vale and the extent of the swamps have occasioned the road to be turned over very steep hills, where the ground rises to the height of thirty-one feet. In the middle of the valley, however, between the Monimet and Scusset rivers, the land is low, rising only five and one-third feet high in the road above the half tide. The elevation of the vale near Dr. Bourne's is greater, the foot of the hills extending there quite to the bank of the river. The elevation of the road opposite to Rose's house, after descending from the steep of the hill, is thirteen feet ten inches; that of the bank of Herring river, eleven feet nine inches; and the surface of the water by Dr. Bourne's, six feet one inch above the level of the sea. The intervals continue, rising gradually, till we come to Monimet village, near Captain Elisha Bourne's house; the elevation of the road, four hundred and twenty-two feet five inches; the middle of the field, eighteen feet one inch; and the nearest part of the swamp, thirteen feet ten inches. When we come to the Monimet village, the road rises to twenty-eight feet ten inches; the ground just before going into Back river swamp, twenty-six feet eight inches; and the head of the swamp, thirteen feet ten inches above the level of the sea. The same height of thirteen feet ten inches is that of the high bank of Buzzard's bay above the same standard.

The high winds, according to the account of the inhabitants, occasioned an uncommon variation of the tides, which gave, at the time of this observation, by my measures, six feet three inches. This a little exceeds one-third of the variation on the other side of the isthmus; that being, from the same cause, at the great difference of eighteen feet six inches between high and low water mark. This was the only time when I measured, but all the accounts agree that the neap tides in Buzzard's bay are four feet, and those in Barnstable bay, at the Scusset shore, twelve feet, which makes the latter to be usually three times the height of the former, and subject to variation three times as great. It is high water on the Monimet three hours and a half sooner than on the Scusset side of the isthmus.

The next operation was to take the sounding, in order to ascertain the shoals which might obstruct the navigation in Buzzard's bay. About half way from Rocky point to Mashnee Island is a bar running quite across the harbor, on which we found seven feet and a half depth at low water, and a clay bottom. Within the bar the general depth is from seven to eight feet in the line from the mouth of the Back river to Rocky point, but east of that line it is from nine to twelve feet; and just without Rocky point eleven and a half and thirteen feet. After pass-

ing the bar, the channel deepens to sixteen feet, and, in the line from the southwest point of Toby's island to that of Mashnee, to eighteen. We steered from the east point of Mashnee, for the Wenormuck point, over a middle piece of ground that runs off from Wareham great hill. The small channel, north of the middle ground, nobody pretends to be useful for the purpose of large vessels. In our course the water shoaled gradually to 11½, 11, 10, 9½, 9, 8½, 8, and 7½ feet, then varied to 8, 8½, 9, and 7½; after which we came into the channel, about a quarter of a mile from the shore, where it deepens suddenly to 9, 12, and 24 feet: the channel lies nearest the point of Wenormuck, which is nearly southwest from Rocky point. Coming into the bay when a vessel is off Wenormuck point, Rocky point, at the head of the bay, is seen between Mashnee and Toby's islands. The channel inclines to the south of the direct course until we come off Mashnee, when Rocky point is just clear of Toby's island. After that the course is directly for Rocky point. But it cannot make any considerable difference, as the direct course over the middle ground affords the same depth of water as over the bar. This depth, at the half tide, is ten feet and a half; and, added to the different elevation of the ground, will give the various depths which will be necessary to be dug for an open canal. That it may more readily be seen at one view, I have framed the following table, in which the comparative heights are placed in parallel columns. The numbers marked on the plan being measured from the level of the sea, I suppose that it would avoid confusion to adopt this method. The channel is marked in a plan of part of Buzzard's bay, which I copied, and magnified, from one already printed in Thomas's Magazine, comprehending the whole cape; Back river is added from my own observation.

Table of Elevations.

Places.	Level of sea.		Monimet low water.		Scusset low water.		Monimet bar.	
	feet.	inches.	feet.	inches.	feet.	inches.	feet.	inches.
Scusset high water,	9	3	12	4	18	6	19	9
Scusset low water,	9	3	6	2	-	-	1	3
Height of sea bank,	29	11	33	0	39	2	40	5
Foot height towards marsh,	2	2	5	3	11	5	12	8
Scusset bridge,	2	1	5	2	11	4	12	7
Fork of Plymouth and Back river roads, south of bridge,	17	9	20	10	27	0	28	3
Jabez Gibbs's barn, north of the Scusset bridge,	13	6	16	7	22	9	24	0
Benjamin Ellis's house, on road to Back river,	16	0	19	1	25	3	26	6
Dr. Well, north of road,	13	11	17	0	23	2	24	5
Cut hill in the road,	30	11	34	0	40	2	41	5
Cut in the swamp, north of road,	9	7	12	8	18	10	20	1
Cut in the summit, south of road,	60	10	63	11	70	1	71	4
Valley, west of T. Burgess,	5	4	8	5	14	7	15	10
Hill near Dr. Bourne's, in the road,	30	11	34	0	40	2	41	5
Road near Ross's house,	13	10	16	11	23	1	24	4
Herring brook at Dr. Bourne's,	3	1	6	2	12	4	13	7
Bank of ditto,	11	9	14	10	21	0	22	3
Road near Captain Elisha Bourne's,	22	5	25	6	31	8	33	11
Middle of field near do.	18	2	21	3	27	5	28	8
Edge of swamp near do.	13	10	16	11	23	1	24	4
Road at Captain Perry's, in Monimet villages,	28	10	31	11	38	1	39	4
Field near Back river swamp,	26	8	29	9	35	11	37	2
Summit of the hill, south of our course,	43	9	46	10	47	0	54	3
Head of the swamp,	13	10	16	11	23	1	24	4
Bank of Buzzard's bay,	13	10	16	11	23	1	24	4
High water in Buzzard's bay,	3	1½	6	3	12	4½	10	8
Low water in Buzzard's bay,	3	1½	-	-	6	1½	7	6

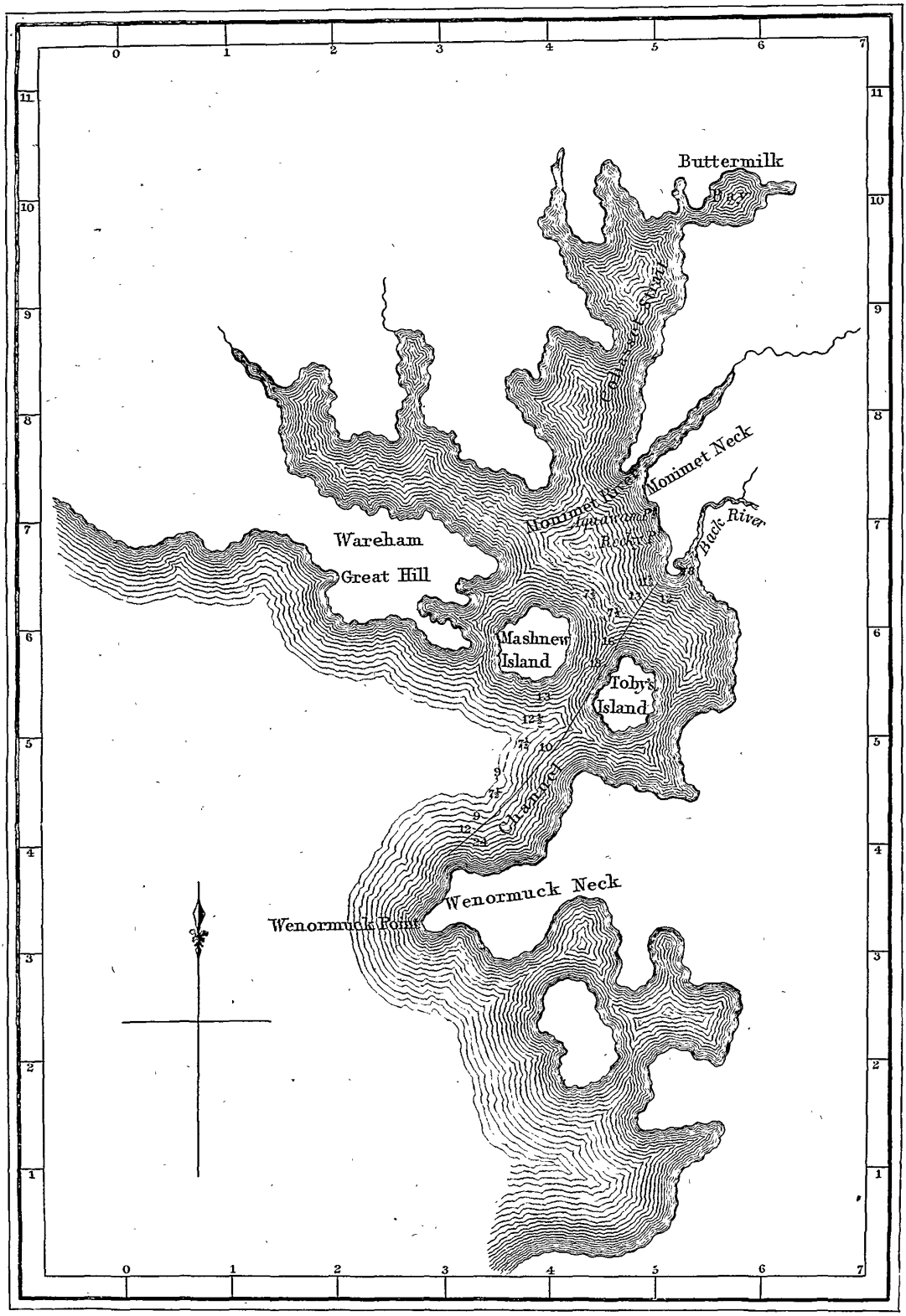
The three hills mentioned south of our course are noted to show the difficulty of straitening the canal by inclining to the south. As the land rises gradually from Barnstable bay to Monimet village, and is there nearly twenty-nine feet high, the mean rise above the level may be stated at fourteen feet and a half, and twenty-five feet above the Monimet bar.

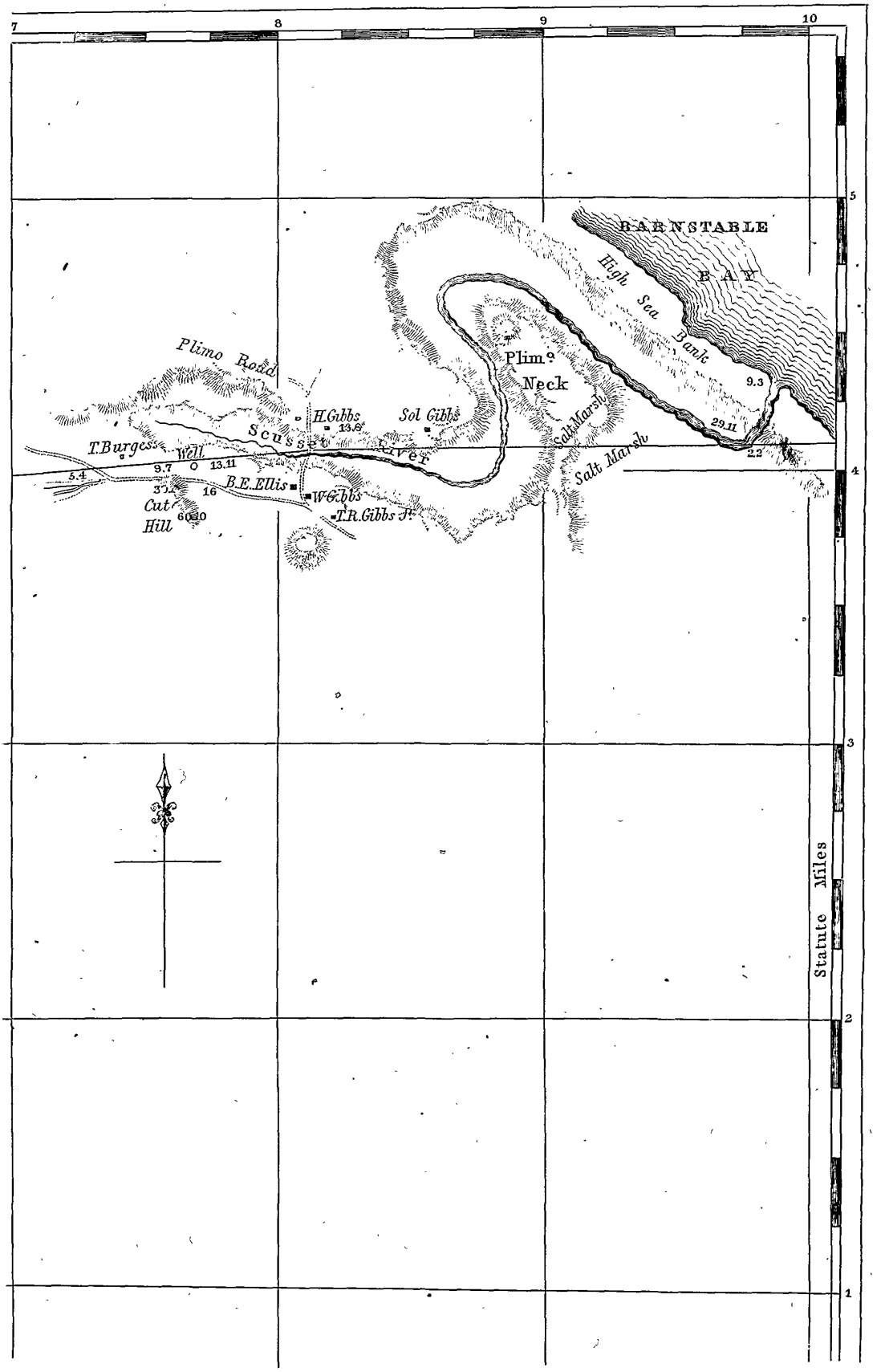
In pursuance of that part of your excellency's instructions which directed me to ascertain the navigability of the bay, I made such inquiries as appeared to me to reach the question. In the direct course from Rhode Island up the middle of Buzzard's bay there does not appear to be any difficulty beyond a mile from either shore. But in passing from the Vineyard sound, between the Elizabeth islands, the channels are rocky and dangerous; and the current between six and seven miles in an hour. The tide rises from the southwest. In the Vineyard sound the current is four miles an hour, and at the head of Buzzard's bay hardly one. The rate at which the tide sets through the natural channel between the islands will furnish a probable estimate of the current in the canal, if the isthmus should be cut off, after making necessary allowance for the width of the passage.

In moderate winters, like those which begun in 1787 and 1788, I cannot find that Buzzard's bay freezes; but it is sometimes encumbered with ice, formed in the rivers and creeks which open into it. In severe winters, like those which begun in 1786 and 1790, the whole bay freezes; and in the former of them a loaded sleigh passed from New Bedford to Falmouth, a distance of five leagues, on the ice. The last winter, though no sleighs passed, no water was to be seen from Falmouth in the course for New Bedford. Along the shores of the Vineyard sound the ice frequently obstructs the passage for boats from the cape to the island, though the sound never freezes over. The tides along both shores of the sound are between three and four feet high, and on the shoals about two feet. On Scusset side of the isthmus I do not find that the water ever has a solid crust of ice, though it is sometimes granulated. This is probably to be accounted for by the greatness of the tides.

Where Scusset river falls into Barnstable bay is an open coast, without any appearance of a harbor for several miles. The idea was suggested in conversation at Sandwich, of making a harbor by extending a mole into the sea. The only case which I found in that neighborhood that may be supposed to furnish an analogy to this proposition, as it is short, I beg leave to present to your excellency's consideration.

About five miles northerly from the mouth of Scusset river is a harbor for boats. The account which is given to me is this: It was formerly upland, as appears from the stumps of trees still existing in it, though none of the neighbors can remember its being in that state. Thirty years ago there was an open passage between two hummocks which lie near the shore, and at high water are islands. For about twenty years the inhabitants were


Buttermilk
Bay
Monimet River
Monimet Neck
Back River
Wareham
Great Hill
Mashnee Island
Toby's Island
Wenormuck Neck
Wenormuck Point


7
8
9
10
5
4
3
2
1
BARNSTABLE
BAY
High Sea Bank
Plimo Road
Plim? Neck
H.Gibbs
13.8
Sol Gibbs
Scussett River
Salt Marsh
Salt Marsh
9.3
29.11
22
T.Burges
Well
9.7
13.11
5.4
B.E.Ellis
16
W.Gibbs
T.R.Gibbs Jr.
Cut Hill
60
20
Statute Miles

obliged, by digging, to clear the inlet of the sand collected there as often as eight or ten times in a year. At last a violent storm choked the mouth of the harbor, and made a new inlet about a quarter of a mile from it toward the southwest. The people endeavor to keep this passage open by wharfing the sides of it, and as the sands accumulated, they continued their wharves for about twenty rods on each side, and dug a canal from it to the little creek that winds through the marsh in the harbor. After about six years from the opening of this inlet by the sea, the wharves were so broken by storms that a great tempest filled the mouth of it, and opened a third channel near the upland on the northeast side of the harbor. This was made commodious for boats, but now in the fifth year's use is so choked that the salt water stagnates upon the marsh. The low water of spring tides is at the inlet about ancle deep; and at neap tides not higher than a man's knee. At high water in spring tides the entrance is about four feet deep; but the low water mark without the harbor is said to be twelve or thirteen below that of high water. The beach is of the same kind as that of Scusset. The harbor extends quite to the Plymouth road, and is a proper salt marsh; the whole of it except a small creek having been mowed the last year.

The different accounts that are given of the width of the isthmus, according to the different views of the parties derive their coloring from the various extent of the tide. They who reckon the whole distance along the valley to be between seven and eight miles, reckon from the low water mark on each side. They who reckon it only two or three miles, leave out the extensive marshes of Scusset river, and that part of Monimet river which is usually affected by the spring tides. Some go so far as to reckon the tides to extend to the head of Scusset river one way, and to Dr. Bourne's the other; which would reduce the remainder below one mile. But neither of the rivers will be of use unless for filling a close canal.

I have now laid before your excellency a very particular account of the isthmus and of Buzzard's bay, with the tides and shoals, and hope it will meet your approbation and that of the committee.

On my return from Falmouth I met Mr. Davis at Sandwich with the resolve of the general court, granting additional power to the committee. As the resolve specified no particular part of the cape to be surveyed, and there had been no meeting of the committee, we agreed to view, but not, without further orders, to survey between Barnstable and Hyannus harbor. We accordingly went there on the 8th of June, and the situation was pointed out to us by Brigadier Otis and Rev. Mr. Mellen, who politely accompanied us across the cape. The highest ground comes into the first mile from the sea, and is estimated by Mr. Mellen at eighty feet high for a quarter of a mile; but no observations have been made with a direct view to determine the precise elevation. After riding a mile and a quarter from the shore, we came to a line of ponds in the direction of Oyster island rather than of Hyannus, which extended about two miles and a half further; and if they can be adopted, will save much labor in forming the canal. It is necessary not only to know their depth, but also their elevation above the sea, for determining this point. Several of them are small. But two of them are of very considerable extent. Since my return Mr. Mellen has favored me with an account of the soundings in the two largest, which are West's and Great Ponds. The latter is estimated at three leagues in circuit. The soundings in the course of the proposed canal are in West's pond 8, 10, 11, 7, 6 feet; in Great Pond 8, 18, 14, 16, 6, 15, 20, 24, 10, 6, 5. Whether any of these depths go to the low water mark is impossible to be determined without comparing the surface of the pond with that of the sea. The whole line of ponds is separated between every two of them by only a few rods distance. The elevation does not appear to be great, as the ground slopes gradually from the foot of the ridge in the first mile to the sea on the south sides. That the ponds are not in any considerable degree fed by springs, appears from this circumstance: About fifty years ago, a small canal was made from the Great Pond through Long Pond to a creek which discharges near Oyster island. It was designed to open a passage for herring. But the water continued to run till the surface of the ponds sunk to the level of the bottom of the canal, when it ceased running. The canal has been partly filled since, and is at present not more than fifteen feet deep in any part, which makes it probable that some of the depths are below the low water mark. The distance from Great Pond over to Hyannus harbor is two miles and a half nearly by estimation, and the land level. On the bar is said to be nine feet depth at low water, and thirteen at high water. Mr. Mellen informs me in his letter that during the war the shortest road was measured from Stetson's wharf, in Barnstable harbor, to Homer's wharf, in that part of Hyannus harbor that bears the name of Lewis's Bay, and found to be four miles and a half. It is all dry sandy land, and covered with wood. The country rises gradually and imperceptibly from Hyannus to the foot of the ridge. The ascent is not sharp on that side, though it is steep toward the town of Barnstable. From a part of the ridge called Kidd's Hill both seas are visible. The tide rises four times as much in Barnstable harbor as in Hyannus. These circumstances we supposed it necessary to lay before your excellency and the committee previous to the passing any order on the subject. The advantages proposed at Barnstable are, that the canal even through the ponds will be shorter than at Sandwich, and will terminate at each end in a harbor. The objection arises from being obliged to pass a part of the shoals before vessels coming in can get to the canal.

I have the honor to be, with perfect respect,

Your excellency's most obedient and most humble servant,

JAMES WINTHROP.

True copy. Attest: JON. L. AUSTIN, *Secretary.*

No. 3. *Weymouth and Taunton.*

SIR: TAUNTON, *August* 17, 1807.

Your favor of the 8th instant came to me the 11th following. I showed the same to Doctor J. Godfrey, of this place, a member of our Legislature, and requested him to inform me what progress had been made by Colonel Baldwin and others, a committee of our Legislature, in surveying and exploring the lands, rivers, and ponds between our Taunton river and Boston bay, and wished him either to give me the particulars, or write you on the subject; he having preferred the latter, herewith you will receive his letter; the committee have been over the ground twice, and were to complete the survey this month, and report to the Legislature next winter. In conversation with Colonel Baldwin, when last at Taunton, he appeared to have no doubt on his mind of the practicability of uniting the waters of Rhode Island bay with Massachusetts bay; that the most feasible route would be up Taunton river to Williams's landing, and then to proceed through the towns of Raynham, Bridgewater, Abington, and Weymouth; that a supply of water could be taken from Nipancikut pond, in Bridgewater, and the Weymouth pond, so called, for boats and rafts; the former pond is about sixty feet higher than the tide waters of Taunton river, and the latter nearly two hundred feet higher than the tide water of Boston bay. What obstructions or remarkable places the committee met with on their route, I am, at present, not possessed of. There is no question of this route being the most favorable for a canal, and attended with the least expense, and of the greatest public utility, than any other: the distance is the shortest, and a supply of water the most easily obtained. As there can be no reasonable doubt of success in such a project, I hope the United States will enter into it with spirit. The advantages of such a canal to the towns of Newport and Boston, and the country through which it may pass, as well as to the United States, are incalculable.

I am, sir, with respect, your humble servant,

SAMUEL I. FALES.

SIR: TAUNTON, *August* 19, 1807.

A few days since Judge Fales showed me a letter, dated August 8, 1807, Collector's Office, Port of Newport, relative to a water communication from Narraganset bay, in your State of Rhode Island, by Providence, Rahoboth, or Taunton river, to Boston bay, in this commonwealth. The distance from tide water, in Providence or Rahoboth river, to tide water in Charles river, Cambridge, or Boston bay, is much further than from tide water in Taunton river to tide water in Weymouth river, which water is discharged at Nantasket road, and I think the only supply of water for a canal to discharge part of its water at Providence or Pawtucket, must be the Mashapog pond in Sharon, a pond but little more than an average mile in diameter; and water in this pond would much sooner find the tide at Taunton than either of the other routes, and pass through lands much more feasible for a canal. The quantity of water in this pond I think doubtful, though I think it sufficiently elevated, as it now discharges all its water, by the Neponset river, at Boston bay; though formerly, in seasons of inundation, a small part passed through our village to Taunton river. The shortest, and I think the most feasible and proper route is one contained in a resolution I laid before the Legislature of this commonwealth in February, 1806, viz: by Weymouth, Abington, Bridgewater, Raynham, and Taunton rivers, &c. to Narraganset bay, &c. This so far called the attention of the Legislature, that they appointed a committee to explore, survey, and report, &c. The committee have been twice over the ground, and would have completed their survey about this time, had it not been for the uncommonly frequent rains; and as Colonel Baldwin, of Woburn, is one of this committee, an accurate surveyor, and a gentleman as well acquainted with projects of this kind as any in this country, I have this day directed a letter to him, requesting him to state such facts as he has collected from his survey, and direct the same to William Ellery, Esq., Newport, R. I., as soon as convenient.

From yours, &c.

JONES GODFREY.

BOSTON, *February* 1, 1808.

The COMMITTEE appointed by the resolve of the honorable Legislature, dated March, 1806, to explore and survey a route for a water communication from the harbor of Boston, through the towns of Weymouth, Abington, Bridgewater, Raynham, by Taunton river, and Narraganset Bay, to Long Island Sound, beg leave to report:

That they commenced the survey at high water mark, Weymouth, Fore river landing, and passed over the most suitable land for making a water communication through the towns described in their commission, taking the course, distance, and difference of level at every station. The distance on this route from the commencement of the survey, to the tide water at Williams's landing place, Taunton river, is twenty-six miles; the highest land they passed over is at Howard's meadow, in Bridgewater, which is 132 feet 10 inches 4-10ths above the tide-waters. This height we should have considered an insurmountable impediment, and have abandoned any further survey, but from the elevated situation of the ponds in its vicinity, viz: Weymouth great pond is about four miles from the landing place, the height of which is 147 feet 5 inches 4-10ths above the tide water, and 14 feet 7 inches above the highest land on this route. The surface of this pond contains 507 acres 16 rods; its depth varies from 10 to 18 feet. The overflowing of this pond formerly was in two directions, one running to the south, into Taunton river, the other north, into Weymouth river; but the late improvement for the erection of mills on the northern outlet has so lowered the pond, that the water now passes through this outlet only, on which stream there are five mills, which in some years, as in the last, were kept constantly in use during the driest seasons. The banks of this pond are well calculated to raise its waters at a very small expense. Cramberry pond is situate in Braintree, about four miles from the summit height in Howard's meadow, which is well calculated for a reservoir, being surrounded with high land on every part, except one natural outlet at the northerly end, of fifty feet in breadth, across which there are the remains of an ancient mill dam, which might be easily rebuilt, and raised eight or ten feet; its surface is 160 feet 9 inches 6-10ths higher than the tide water, making it 27 feet 11 inches 2-10ths above the summit height; there is also a stream which empties itself rapidly into this pond at the southerly end. The communication of Weymouth great pond with the summit height must unavoidably pass by the outlet of Cramberry pond, by which it can be connected, or not, as occasion may require. This communication will intersect several small streams which would serve as auxiliaries to supply any loss of water in its passing from the ponds to the summit level. There are also several streams at the west end of the summit, which, if requisite, might easily be led as feeders for the canal at the upper level; the most noted of them are, one from the Bear swamp, the other from Curtis's pool. Of the ponds adjacent, there are two in Braintree, one called the Great and the other the Little Pond. The Great Pond is situated about five miles from the summit height, and is 109 feet 5 inches 2-10ths above tide water; this can be conveyed to a third level if needed, on the northerly part of the canal. The largest pond on this route is situated partly in Bridgewater, and partly in Raynham, called Nippimicket pond; is reputed to contain about 1000 acres, and

its surface is 49 feet 1 inch 4-10ths above the tide water. This pond alone is sufficient to supply the whole of the canal below its level on the southerly part of it, till it meets Taunton river at Williams's landing; from whence the river is navigable to Narraganset bay, and Long Island sound. We passed, also, (on this route,) by Furnace and Forge ponds, which could easily be conveyed to the canal, if an additional supply is wanted in the lower levels.

We observed, throughout this survey, that the streams generally inclined towards the east, and the land appearing more favorable for a canal, induced us to survey a more eastern route, commencing at Weymouth Back landing, and passing through the towns described in our commission, as far as Titicut bridge, which is over the principal branch of Taunton river, the distance about 23¼ miles, noting, in the same manner, the course, distance, and level of each station, as in our former route, both of which are described on the plan. The summit height on this route is at Curtis's meadow, where, as on the other route, the waters divide themselves and take different directions, one part running southerly towards Taunton river, the other northerly to Weymouth river; its height, 131 feet 10 inches above tide water. The Weymouth great pond can be led to this summit with much less expense than to the summit of the former route; the distance is about 3½ miles, and is 15 feet 7 inches 4-10ths lower than the pond. Cramberry pond can also be led into it, if more water is needed. The first pond we pass on this route is Whitman's pond in Weymouth, about three quarters of a mile from Back river landing, and is 54 feet 10 inches 9-10ths above tide water, and can be conducted to the fifth level. This pond is sufficient to supply all the locks below its level on the north part of the canal. The next pond is called Burrill's mill-pond, which is 90 feet 2 inches 5-10ths above tide water; this will serve for a reservoir for the third level. On the north part of the canal, in Abington, we pass by Nash's mill-pond, which is 82 feet 5 inches 7-10ths above tide water, which will furnish water for the fourth level; this route can be fed with many small streams which we intersect, as also some small rivers. After crossing John's river in Bridgewater, which leads into Taunton river in a very circuitous route, and bordered with swamps, we avoided following the course of the river, and crossing over the high lands, we intersect the same water at Titicut bridge, where we finished this survey.

In both those routes, more favorable ground for a canal might be selected than is represented on the plan. Such a correct survey would require much time, and, consequently, create great expense; your committee considering that the information of the practicability of such an object was all that the honorable court required of them. From the quantity of water which is above the summit height, we readily formed an opinion that a canal might be made to connect Taunton great river with the harbor of Boston; but the calculation of the size and draught of water we agreed to defer until the survey was completed; but by the dispensation of Providence, in the death of Colonel Baldwin, your committee, as well as the public, are deprived of the talents and abilities he possessed in this particular branch of his profession. We should have discontinued our survey, and made a particular report of the progress made at the time of his decease; but considering that through the whole course of our survey there were but a few instances of a difference of opinion, and those not so material as to affect the principle.

As canals wholly depend on an ample supply of water at their summit height, to enable us to form a more correct judgment, we took an accurate survey of the Weymouth great pond, from which we make the following calculation:

1st. That the surface of the pond contains 507 acres and 16 rods, equal to 22,089,276 cubic feet.

By raising the waters of the pond three feet will give the command of five feet depth, making 110,446,380 cubic feet.

Admitting a canal to be built sufficient to receive a vessel from 75 to 100 tons burthen, drawing 8 feet of water, such as the coasting vessels which trade between Boston and New York; those employed in the southern trade draw less water being of the same burthen; the locks in this case must be in length, 80 feet, breadth 22, depth 10; making, for each lock, 17,690 cubic feet.

At this upper level there will be a loss of two locks of water for each vessel=35,200 cubic feet.

Supposing 12 passages each day=422,400 cubic feet.

For 8 months, or 244 days, are cubic feet, - - - - -	103,065,600
Leaving for waste by leakage, evaporation, &c., - - - - -	7,380,780
	110,446,380
Exclusive of Cramberry pond, which, at five feet deep, affords - - -	6,534,000
With the above surplus, - - - - - - -	7,380,780
Which allows one-eighth part for loss, - - - - - -	13,914,780

Without considering the flow from springs, inlets and rains, this pond is 13 feet 4 inches 2-10ths higher than Weymouth pond.

The upper level on either route may be reduced ten feet for one mile in length, in which the water will accumulate sufficient to supply any loss by exhalation, and not being so exposed to leakage, will, at the same time, be a saving of two locks.

2d. The second level from the summit height must receive its whole supply from the same source with the upper level, excepting some small streams it intersects, which may be used as feeders for this level.

3d. The third level, on the northerly part of the canal, can receive aid from the Braintree great pond, which lies about eight feet higher than this level; its surface is equal to Weymouth pond, and empties itself into Fore river; it will furnish water for all the locks below this level.

4th. The seven upper locks on the southerly part of the canal must also receive their principal supply from the same source with the upper level. There are several streams at a short distance from this part of the canal, from which could be formed reservoirs to supply any deficiency.

5th. The eighth level passes by the side of Nipinitick pond, which is the largest pond on either route, and will afford all the water necessary for the canal till it meets the tide water in Taunton great river.

6th. On the Eastern route, the highest ground is at Curtis's meadow in Abington, which can receive its water from the same source as the other route, with much more ease, as before stated. The seven upper levels on the northerly part of this canal must also receive its supply of water from Weymouth great pond.

7th. The eighth level passes by Whitman's pond, which is before described, empties itself in Weymouth Back river, and contains water sufficient for all the locks below it.

8th. The southerly part of this canal, in addition to the water from the upper level, can receive a full supply from Blanchard's, Nash's, Bicknell's, Hobart's, and the furnace ponds, till it meets the main branch of Taunton river at Titicut bridge, from whence, to Taunton landing, the distance of seven miles, the river navigation would be preferable to continuing the canal, if the bed of the river be lowered in some places.

The locks and levels described on the plan are of the equal height of ten feet each; the different situations and number of locks cannot be ascertained with certainty until the canal is properly located. The survey was taken with the spirit level, without any deduction for the curvature of the earth.

There are many other large ponds between the habor of Boston and Taunton river, but not being within the limits of the resolve, were not included in the survey. On the west, in the towns of Canton, Stoughton, Sharon, Norton, &c. which, perhaps, might be connected with Neponset (or Milton) river; and on the east, in Middleborough, Pembroke, Halifax, &c. which probably might better connect Taunton river with the North river, in Scituate harbor.

Many great advantages will be received by the towns through which this canal passes, by a water communication for the great quantity of timber, plank, &c. for ship building, with which this part of the country abounds. The number of iron works will be accommodated by an easy conveyance of the heavy articles of their different manufactories of their furnaces, forges, and slitting mills, while the great object of facilitating the trade between this and the Southern States is accomplished by avoiding the great delay and danger in passing around Cape Cod, which causes the loss of many lives, as well as property, annually, added to the superior advantages of an inland communication by water between the capitals of New York and Massachusetts in a time of war.

Which is respectfully submitted by

WILLIAM TAYLOR, } *Committee.*
ELIPHALET LOUD. }

The committee to whom was referred "the report of a committee appointed to explore and survey a route for a water communication from the harbor of Boston through the towns of Weymouth, Abington, Bridgewater, Raynham, by Taunton river, and Narraganset bay to Long Island sound," report:

That the committee appear to have executed the duties of their commission with great accuracy and fidelity, and that their report and plan contains much valuable information, and demonstrates the union of the harbor and sound to be practicable in the course surveyed.

Your committee are destitute of the documents and information which would enable them to decide whether the proposed route be the most eligible of any that may be discovered, and are not prepared to recommend the undertaking of this project at the public expense. They, however, indulge a hope that the survey now made will invite the attention of the public and of enterprising citizens to this useful employment; and, for this purpose, they recommend the following resolve, which is submitted:

Per order, H. G. OTIS.

Resolved, That the report of William Taylor and Eliphalet Loud, who were appointed, by a resolve of the general court in March, 1806, "to explore and survey a route for a water communication from the harbor of Boston to Long Island sound," be printed in the Independent Chronicle and Columbian Centinel, and all the other newspapers in which the laws of the commonwealth are published; and that said report, and the plan accompanying the same, be carefully preserved on the files of the general court; and that the committee who performed said service, present their accounts to the Committee of Accounts for allowance.

In Senate; February 18, 1808. Read and passed, sent down for concurrence.

SAMUEL DANA, *President.*

In the House of Representatives, February 22, 1808. Read and concurred.

PEREZ MORTON, *Speaker.*

February 28, 1808. Approved.

JAMES SULLIVAN.

True copy: Attest, JONATHAN L. AUSTIN, *Secretary.*

A. No. 2.

RARITON AND DELAWARE CANAL.

Extract of a letter from James Ewing, Esq. to the Secretary of the Treasury, dated

TRENTON, *November* 11, 1807.

About the beginning of the year 1796, a company was formed and incorporated for the purpose of opening the navigation of the Assampink creek from this place through a large tract of timber land lying from eight to sixteen miles distant. In this scheme I was pretty deeply interested; it was the object of the promoters of it, if they should succeed, to turn their views from the mouth of Shippetankin across the great meadows towards, and in due time to, the Rariton. The scheme, however, was frustrated, principally by the directors having injudiciously expended the money of the company in clearing out the obstructions in the bed of the creek, instead of digging a canal and turning the waters of the creek into it; for whenever the waters were high enough, the stream was too rapid for the boats, and more particularly rafts, to pass. This was the first attempt made in this State.

About the beginning of the year 1803 a scheme was set on foot for forming a company to open an inland navigation from the tide waters of the Delaware to the tide waters of the Rariton. Several meetings were had, and a committee was appointed to take the level, &c., of the country between these two points. An act of incorporation was procured, and several attempts made to procure subscriptions, but very few, if any, were procured, and no company has ever been, and none probably ever will be, formed under this act. The committee, however, proceeded, and actually took the level of the country. A copy of their report I have, with much difficulty, procured, and do myself the honor to enclose.

By this report it will be seen that the object of the committee and of their employers was to follow the course of the creeks generally, and, by removing obstructions, &c., to make their beds navigable. The futility of this plan will be immediately evident to the scientific mind, it being now perfectly understood that the only use rivers and creeks can be of, is to fill canals; yet this report, with the table of elevation and depression made by the said committee, will afford much useful information.

As this is a canal of the most public consequence of any which can be set on foot in this State, and one which would open an inland navigation between the cities of Philadelphia and New York, my attention has been wholly directed to it; and I shall endeavor to answer the queries with respect to it as fully as my information will enable me.

1st. The tide waters on the Delaware and Rariton are twenty-six miles distant from each other in a direct line,

and it is believed that the necessary deviations from a direct line would not require the canal to be more than half a mile longer.

2d. It appears, from the table of elevation and depression, which I enclose, that the highest ground between those points, viz: Philips's spring, is about fifty feet above the tide waters in those rivers. It will also be observed that the mouth of the Shippetankin on the Assanpink, and the Stony brook at the bridge near Rowley's mill, distant about seven miles from each other, are upon a level, and about seven feet below Philips's spring. A canal, therefore, of seven feet deep on the highest ground would bring the bottom of it to a level for rather more than seven miles from one of these points to the other. The ground between them is one continued meadow, very retentive of water, and remarkably easy digging.

3d. This must be left to the judgment of the engineer, probably six, or perhaps eight on each side. Materials of every kind for these are in great plenty at very short distances.

4th. A quantity of water may be had from Philips's spring, from two or three other springs along the meadow, and from some brooks which fall into the meadow. If these should be found insufficient, the whole of Stony brook may be turned into the canal by a feeder of very inconsiderable length, and should these fail, the whole of the waters of the Assanpink creek, from Hutchinson's mill, may be brought into the highest part of the canal by a feeder of one mile and a half in length; this is a considerable stream, and believed to afford water more than sufficient for every purpose of the canal in the driest seasons; but I know of no person capable of reducing the quantity of water afforded by these streams to time and measure.

5th. I am of opinion that no part of the beds of any of the creeks or rivers can be improved to advantage; you will, however, see what the committee say on that subject in their report.

6th. This must be left to the judgment of the directors and engineers.

7th. There are perhaps three or four streams in the course which, in my opinion, the canal will be most likely to take, over which it may be necessary to construct aqueducts. None of these are more than a few yards across, and I am induced to suspect that an able engineer may find means to avoid that expense, but I am not a sufficient judge. There are no hills which it will be found necessary to tunnel. If the sand hills, a few miles on this side the Raritan, cannot be avoided, it will be necessary to dig through them to the depth of perhaps thirty-five feet in the highest place.

8th. There are no obstructions except what are mentioned in the preceding article. I am assured that by a small deviation in the course of the canal, the sand hills may be entirely avoided, and that a fine valley of easy digging will present itself through the remainder of the course; but I am not sufficiently acquainted with that part of the country to say that my information is correct, if it be the canal, for almost the whole of its course will pass through a level, light land, free from rocks, and where the digging will be easy, and the banks good.

10th & 11th. On these I can form no satisfactory estimate; the opinions of others, which I have heard, are so different, that they do not deserve the mention; certain it is, that great quantities of merchandise are now transported by land on the new turnpike as well as by other routes.

SIR: TRENTON, *November* 18, 1807.

Since I wrote you last, I have obtained a sight of a map of the country through the middle part of this State, said to be from actual survey. As, upon examination, it appears to me the most correct of any thing I have seen, I got leave to copy it; though neither my time nor abilities as a draughtsman would enable me to offer you any thing elegant, yet, as correctness is the object of most consequence, I think I may venture to assure you it is the most correct of any thing of the kind that can be procured. Although, as I have said, my opinion is decidedly against making use of the streams for any purpose but that of filling the canal, yet, as others differ from me in opinion, I do not wish to withhold any information. I have laid down the whole course of the streams the committee have thought proper to pursue, and have marked the points referred to by them in their report.

I have laid down the course which I suppose would be the most advantageous for the canal; I have also laid down the turnpike road from this place to New Brunswick.

I am, with respect, sir, your most obedient servant,

JAMES EWING.

ALBERT GALLATIN, Esq. *Secretary of State.*

The COMMITTEE appointed to cause a survey and level to be taken of the waters of the Assanpink, Stonybrook, Millstone, and Raritan, beg leave to report to the general committees:

That, pursuant to their appointment, the committee met at Trenton, on Monday, the 23d day of May, 1808, and having provided a theodolite, and employed a surveyor and chain bearers, proceeded to the purposes of their appointments; but the instrument for taking the level being out of order, they were delayed for several days at Trenton. Having, at length, procured instruments properly adjusted, they ran a line of level from the water in the mill-pond, at Trenton, to the tide water of the Delaware, at Lamberton, and found a fall of sixteen feet six inches from the surface of the water in the mill-pond, to the surface of the water at Lamberton, in ordinary tides. Some difficulty presents itself in devising the most eligible mode of opening the communication between those two points. About one hundred and fifty yards below the mill, on the Burlington side of the bank, there is a gut or hollow which leads quite to Lamberton, nearly on a level for the whole distance; and a canal may be easily opened through it with small expense. From the mill-pond to the hollow, there must be a canal, which may be taken on either side of the creek. If taken on the lower or Burlington side, the canal will be from fifteen to twenty feet below the surface of the street where it crosses it, and must be supported on the side next the water, from those to the mouth of the hollow, by a stone wall of at least twelve or fifteen feet in height, and one hundred and fifty yards in length. The soil through which the canal must pass is a bed of gravel and porous earth, and will require that the canal be puddled with clay, for the whole length of it, until it meets with the hollow leading to Lamberton. If the canal be taken on the side of the creek next Trenton, it must cross the street a short distance above the house of James Ewing, Esquire, about four feet below the present surface of the street, and continuing around the edge of Mr. Ewing's meadow, and along the street leading parallel to the creek, until it comes to the new street lately opened; thence, pursuing the line of the new street till it comes to the creek across which it must be taken on arches, to the mouth of the gut or hollow above spoken of. The surface of the water in the canal, where it must cross the creek, will be twelve feet and some inches above the water in the creek. There is also a third mode of communication between the waters of the Assanpink and the Delaware at Lamberton, which will be spoken of hereafter.

In the afternoon of Thursday, 26th of May, we proceeded up the Assanpink, two of the committee and an assistant going in the boat, and the rest with the surveyors, &c. on foot. From the mill dam at Trenton, we found a fine level sheet of water, from eight to forty-two feet in depth, to the old iron works at Grammout's, of sufficient width, and with no obstruction in it; from the old iron works to the mill of Mr. Burrows, distance ——— from Trenton, there is a pretty strong current, and an elevation of seven feet nine inches; the water of various depths, from three feet to eighteen inches. Here it will be necessary either to raise a dam, or to cut a canal from the foot of Burrows's dam to the old iron works, or head of the Trenton mill-pond. The ground on both sides very practicable digging, and particularly so on the north side, where there is meadow ground with a gentle descent to the creek, and a perfect level can be run. The locks to be here erected will be seven feet nine inches in height, the distance of the canal. At Burrows's mill dam there must be a lock five feet eight inches in height.

Friday, the 27th, we began at Burrows's mill, and proceeded upwards. The mill-pond, until you come within one hundred and fifty yards of Philips's, or the Burnt mill, is two feet in the shallowest places, and, in most, from two to eight feet in depth. At the Burnt mill there is a canal leading from the mill-pond to the foot of the tail water, or nearly to the head of Burrows's pond, and also a lock, badly constructed and out of order. There is a fall of six feet and nine inches at the Burnt mill.

About half a mile above the Burnt mill, Shabbacurick, on one side, and a large bold creek called Miry run, set into the Assanpink. Many places towards the head of the Burnt mill pond will require clearing, some straightening, and enlarging in width. The depth of water, about three and a half feet in the shallowest places, when the pond is full, to the head of the pond, which is about a mile in distance; from the head of the mill-pond to Coleman's, the current is strong; and the creek, which forms a large bend between Coleman's and Mershon's, the depth from two feet six inches to eighteen inches, with a fall from Coleman's to the head of the pond of three feet and half an inch. Here it may be advisable to cut a canal across from Coleman's to the head of the Burnt mill pond. The soil is a fine meadow, easy digging.

From Coleman's we proceeded on Monday, 30th, to Hutchinson's mill-pond; the water all the way of a pretty strong current, and from two to three feet in depth; the creek narrow and extremely crooked, and the bends so short as to require that it be straightened, to fit it for the purpose of navigation. The ground on both sides, a low meadow, very easy digging, and the fall from Hutchinson's mill tail to Coleman's is two feet four inches. The water in Hutchinson's pond is five feet one inch and a quarter above the water below the mill. There is a lock in the dam in pretty good order. About ——— distance below Hutchinson's mill, Shippetankin creek, (formed by the junction of Eight Mile run and Sandy run) sets into the Assanpink.

Tuesday afternoon (having been detained by rain in the forenoon) we proceeded to run a level across the Great Meadows, from Assanpink to Stony brook; we found the highest points between the two creeks, to be near Philips's spring, where the water in the great ditch is about seven feet above the water in the Assanpink, at the mouth of the Shippetankin, and within a few inches of being on a level with the water in Hutchinson's mill-pond; the intervening ground betweeen Hutchinson's pond and the Stony brook, at the Duck pond, being nearly a level, and of the easiest digging. The water of the Stony brook, at the Duck pond, is about two feet below the Crown water or Philips's spring: from the Duck pond we proceeded on Wednesday, down the Stony brook to the foot of the Long Reach, the water about three feet deep, distance about ———; some obstructions are to be found in the Long Reach, by logs, &c., which must be removed. A dam thrown across, at the foot of the Long Reach, of about two feet and a half to three feet high, will raise the water of Stony book to a level with the water of Philips's spring, and Hutchinson's mill-pond. The banks along the Long Reach are sufficiently high to admit of such a dam without endangering the adjacent lands, or exposing them to the inconvenience of being overflowed; from the foot of the Long Reach, we left the Stony brook, and run a line of level through the meadows, to Schenck's woods, where we again proposed to use the bed of the brook for some distance, the water sufficiently deep at the lowest times; from the lowest side of Schenck's woods there must be a canal cut to the Millstone, as no other part of the bed of Stony brook can be used with advantage; from the foot of the Long Reach, we found a fall of about four feet eleven and a half inches to the water at Stony brook bridge, near Rowley's; so that from the Crown water to this place, there is a fall of about seven feet, and Rowley's mill-pond we found to be seven feet one and a half inches above the water at Stony brook bridge. Hence it is found that the water in Hutchinson's mill-pond, at the Crown level, and Rowley's mill-pond, are within a few inches of being on a level.

On Thursday, the ——— of June, we proceeded down the Millstone from Rowley's to Gulick's, and found the water upon a dead level from the foot of Rowley's tail race; about three and a half to six feet in depth, wide and perfectly straight for nearly the whole distance, about two and a half miles; at Gulick's, we ran a level from his mill-pond across through his meadow to the foot of the falls at the head of Cruzer's pond, and found the fall to be five feet seven and a half inches. Here it will be necessary to cut a canal, as the water from the mill dam to this place is shoal and rapid.

From the falls to Cruzer's, the water is on a level, and from four to ten feet in depth; and a fall at his dam of five feet eight inches. Below this, to Vandoren's mill, the water is from three feet to six and eight feet; many obstructions are to be found from logs and trees fallen in, and large quantities of brush, mud, &c., formed thereby. The fall at Vandoren's mill-dam is three feet five and a half inches; from thence to the head of Sythoff's mill-pond near Major John Baird's, it may be necessary to cut a canal across Skilliman's and Simonson's meadow, to avoid a great bend in the river, and a considerable shoal; the fall from the dam at Vandoren's to the head of Sythoff's pond is about three feet; from thence to Sythoff's, the water is about four feet in depth, and no obstructions; at Sythoff's the fall is three feet four and a half inches. For about one hundred and fifty yards below Sythoff's, the water is about two feet deep; after which is a fine, still, straight sheet of water, about three and a half feet to five feet deep, to Bayard's mill. There the fall is three feet ten inches; from thence the water is shoal, not above twenty inches to two and a half feet deep, for about two hundred yards; after which, it is about three and a half feet deep, until within about two hundred yards from the mouth of Millstone, where it is very shoal and rapid, as is also the Raritan for a quarter of a mile below the mouth; from thence to Middlebrook, the Raritan is sufficiently deep, but between Middlebrook and Roundbrook it is rapid, and there is a fall of three feet seven inches; from thence, for a mile, it is again deep and still; the remainder of the Raritan to tide water, and for some distance below the landing bridge, the water is shoal, and the banks mostly high, of a red shell. The total fall from the mouth of Millstone to the level of the tide at ordinary times, is thirteen feet. Three strong dams thrown across the Raritan at suitable distances between the mouth of Millstone and the tide water, of five feet in height, would, in the opinion of your committee, render the navigation of the Raritan as easy as that of the Millstone.

It has been observed above that there was a third practicable mode of opening a communication between the Assanpink and the Delaware at Lamberton; this is, by cutting a straight canal from Burrows's mill to Lamberton. The ground intervening is tolerably level and of very practicable digging, and the distance is ———.

If this mode should be adopted, the fall at Lamberton, or between the two points, will be 24.3, and will require at least three locks.

Your committee conceive it their duty to point out in their report the several modes which suggest them-

selves to us without coming to any decision on the subject, or giving the preference to one over another; but they hope to be indulged in a few general remarks on the whole subject, which present themselves to your committee, and could only result from an actual survey of the whole ground.

It is with pleasure your committee have to observe, that from the review they have been enabled to take of all the circumstances connected with the great object of their appointment, the facility of the undertaking exceeds the most sanguine expectations which have been formed of it. The Assanpink is a stream which, at all seasons of the year, affords so bountiful a supply of water, and, in consequence of the several dams erected on it, presents so level a surface, as to assure a safe and easy navigation for vessels of any size requisite in an inland navigation of this kind. The Crown waters, consisting of Philips's spring and Eight Mile run, are fully sufficient to supply a canal between the waters of the Assanpink and Stony brook. The relative situation of the three important points, viz: the water of Hutchinson's pond, the Crown level, and the Stony brook, at the Duck pond, if the proposed dam is made, assuring a supply from the Assanpink, if necessary to be resorted to, leave no room to doubt of the efficiency of the canal of communication for all the purposes required. The Stony brook also, as far as the same is proposed to be used, is, in the opinion of your committee, amply sufficient, and the Millstone and Raritan, with small expense, may be made one of the best inland navigations perhaps in existence.

Upon the whole, your committee are of opinion that, with the aid of persons of professional skill to direct the operations of the proposed company, and superintend the execution of those plans which a scientific mind may suggest, a communication may be opened between the tide waters of the Delaware and Raritan, of at least three feet and a half in depth, which, with boats properly constructed, may be sufficient for all useful purposes.

ALEXANDER ANDERSON,
JOSEPH BREARLY,
JOSEPH STOUT,
THOMAS P. JOHNSON.

A correct copy from the original, examined.

MAY, 1803.

A table of distances from the tide waters of the Delaware to the tide waters of the river Raritan, agreeable to the survey taken by Messrs. Johnson & Anderson.

	chains.	links.
From Lamberton, up the hollow, to the new bridge, on the Assanpink,	90	44
From the new bridge to Burrows's mills,	164	50
From Burrows's to Burnt mills,	105	44
From Burnt mills to Coleman's bridge,	151	00
From Coleman's bridge to the mouth of the Shippetankin,	31	34
From the mouth of the Shippetankin to Hutchinson's mills,	69	62
From Hutchinson's mills to Cranberry pond,	32	11
From the mouth of Shippetankin to opposite S. Brearley's,	79	49
From thence to the lane leading across the meadows,	66	96
From thence to Duck pond,	130	68
From thence down Stony brook to the old saw-mill bridge,	119	86
From old bridge to a log opposite J. Stout's,	114	42
From said plan to a bridge on the road leading fron Princeton to Rowley's,	115	45
From said bridge to Stony brook and Rowley's mill race,	53	09
From thence down Millstone river to Major Gulick's mills,	156	87
From Gulick's to the Falls of Millstone,	85	31
From said Falls to Cruzer's mills,	74	85
From Cruzer's mills to Oppies Cove,	154	60
From Oppies Cove to Vandoren's mills,	89	03
From Vandoren's mills to Greggston bridge,	47	77
From Greggston bridge to Sythoff's or Merser's mills,	276	26
From said mills to the bridge at Millstone village	167	77
From said bridge to Bayard's mills,	194	43
From Bayard's mills to the mouth of the Millstone,	132	08
From the mouth of Millstone to Bound brook,	188	70
From Bound brook to the bridge at the landing,	416	61
	3206	68

3206 chains 68 links reduced to miles, are 40 and a small fraction.

Table of elevation.

	feet.	inches.
From Lamberton to the water in Walls's mill-pond,	16	6
To the head of the rapids at the old iron works,	1	0
To Conal's mill-house,	2	6½
To foot of Burrows's mill-pond,	4	6
To the water in Burrows's mill-pond,	5	7½
From the head of Burrows's to the waters of Burrel's mill-pond,	6	7⅜
To the head of the pond,	2	0
To Henry Mershon's,	1	3
Round the pond to J. Coleman's,	3	1⅝
To Coleman's bridge,	0	3
To the mouth of Shippetankin,	0	5
	43	10

	feet.	inches.
From Shippetankin mouth to the foot of Hutchinson's dam,	1	8
To the water in the pond,	5	1¼
From Shippetankin mouth to S. Brearley's,	1	8
From thence to Philips's spring,	5	4½
	13	9¾

Table of depression.

	feet.	inches.
From Philips's spring to Duck pond,	1	8
To Stony brook bridge by Rowley's,	5	3⅜
From thence to the foot of Rowley's mill-race,	0	6
From Gulick's pond to the falls in Cruzer's pond,	5	7⅛
Draught of Cruzer's pond,	0	6
Cruzer's head and fall,	5	8
Head and fall of Vandoren's pond,	1	6
Vandoren's head and fall,	3	5½
From his dam to the rapids below Baird's,	2	2
Draught of Sythoff or Merser's pond,	0	6
Draught of Sythoff's head and fall,	3	4½
Draught of Bayard's pond,	0	6
Draught of Bayard's head and fall,	3	9⅛
From his dam to the mouth of the Millstone,	1	6
From the mouth of Millstone to the landing bridge on the Raritan,	12	7⅞
	50	11⅛

A. 3.

CHESAPEAKE AND DELAWARE CANAL.

SIR: PHILADELPHIA, *January* 4, 1808.

I had the honor to receive your letter of the 17th September, enclosing a printed circular, with sundry queries to be answered, so far as they apply to the Chesapeake and Delaware canal, and must apologize for delaying my reply to the present period; this delay has arisen from a desire to procure sundry documents relative to the present land carriage over the peninsula, which have not been furnished me till very lately, and from the distant situation of two other directors of the company, who compose with me a committee appointed on this subject. I could not easily obtain from them an earlier communication of their sentiments; they have, however, at length given me the necessary information, and committed to me the duty of replying to your letters, under an impression that, as the board of directors have heretofore allotted to me the business of preparing their papers, the subject of them may be more fresh to my recollection.

From the commencement of the important work in question, the president and directors have been extremely solicitous to furnish the public with a correct account of their proceedings; hence have arisen the very ample reports made to the annual meetings of the stockholders; of these, together with the memorials to Congress, and other papers which have been printed, I transmit you copies, collected together in one small volume; and sensible that they will furnish you with nearly the whole history of the work, from its commencement, I beg leave to offer only a few observations upon them before I proceed to answer your queries.

You will perceive, how early the near approach of the head waters of the Chesapeake and Delaware attracted the attention of the inhabitants, and induced many public spirited individuals to attempt the establishment of a canal navigation between them; I am now possessed of nearly twenty surveys, made by my father Mr. Thomas Gilpin, at different portages on the peninsula, some of them so early as the year 1765. From the causes mentioned in the reports, however, no effectual measures were adopted for the purpose, until the acts of Maryland, Pennsylvania, and Delaware, incorporated the present company in the years 1799 and 1801.

You will also perceive, sir, the attention with which the president and directors laid the foundation of the work, by prosecuting during the first year an extensive and minute survey of the whole area of the country, and waters, which appeared in any measure suitable for the canal; and that these surveys were made by professional men of the best talents and information on the subject in the United States, particularly Mr. Latrobe, as principal engineer; the result of these surveys was as follows:

1st. Charts and soundings of Christiana creek, and of the shores of the Delaware, at the positions appearing proper to form the Eastern termination of the canal.

2dly. Similar charts and soundings of Elk river, Back creek, and Bohemia, on the side of the Chesapeake.

3dly. A complete map of the whole area of the country, and of thoses passes over it, where a route for the canal appeared practicable.

These papers are now mostly in the possession of Mr. Latrobe, whom I have requested to lay them before you, in order that you may fully comprehend this part of the subject, aided by his observations. From the fact they established as to the situation, general level, and soil of the country, the following important measures obviously resulted:

1st. That as the streams of either bay were little more than estuaries, or arms of those bays, much obstructed in their navigation, and furnishing no supplies adequate to the purposes of the canal, it could be furnished with water in sufficient quantity, only from the streams at the upper extremity of the Peninsula, which rising among the hills of Pennsylvania, were different in their character from those below; these streams were Elk, Christiana, and White Clay creek, from whence it was obvious an abundant supply of water could be obtained.

2dly. The sources of supply being thus fixed, the route for the canal became necessarily established as near them as possible, all other circumstances being duly considered.

3dly. These circumstances all united to confirm the same conclusion; first by the distance being shorter, and secondly, the ground more practicable than on any other route.

4thly. The supply of water being found sufficient for a canal of large dimensions, capable of conveying the vessels usually employed in the trade of the two bays, the construction of the canal of that size became an obvious result.

5thly. The canal requiring to be filled with water before it could be used, and also large supplies of stone, timber, lime and other materials, which were found on the course of the projected feeder or canal of supply, the construction of that work appeared the most beneficial mode of commencing the operations of the board.

An additional reason influenced the board in making their commencement; which was to collect by degrees the necessary workmen, tools, implements, machinery, and outfit of the work; to reduce the operations to system upon a smaller scale, and to gain experience in all their proceedings before they began the most extended parts of the undertaking.

Upon these principles the route of the canal was decided, and a more minute survey of it, as well as the feeder formed, and the execution of the latter begun, and carried on from the 1st of May, 1804, until the board were compelled to discontinue it early in 1806.

In order to assist your information as to the nature of the country over which the route is established, I shall transmit you herewith the section of the canal itself from which you will perceive the easy, level, and practicable appearance of its whole course.

The time which has been employed on the works of the feeder, is, as you will perceive, about two years; the extent of work executed four miles, and the sum expended on the work about $90,000.

In drawing any conclusions from these premises, applicable to the future operations of the canal, I must beg leave to suggest the following observations:

1st. The very difficult nature of the ground on the course of the feeder, which winding among hills, rocky ground, morasses, &c. presented numerous obstacles and greatly extended both time and expense.

2dly. The first season was principally occupied in collecting workmen, building houses for their accommodation, and drawing from distant courses almost every thing requisite for the work; and these desultory operations continued to consume a large proportion of the whole time it was in progress.

3dly. A large proportion of the sum expended was also consumed in the houses, tools, machinery, &c. which may be properly termed the outfit of the work, so formed, however, as to be applicable to all its future operations.

4thly. Not only this outfit, but a large quantity of materials, particularly of hewn stone, was procured towards the main canal.

Hence, in the opinion of the board, as well as of the engineer, the work thus executed cannot be considered as more than equal to one year of fair unimpeded operation; and deducting the outfit and materials procured towards the future work, it has not actually cost more, if as much, than $10,000 per mile.

The advantages which the board experienced may be classed under the following heads:

1st. The number of workmen collected and reduced to system; artists formed on various parts of the work; great experience acquired by them, as well as by the directors themselves, and the general outfit accomplished.

2dly. The water rights on which the canal must depend for a supply were obtained, and in a great degree brought into actual possession.

3dly. The supply of stone and various other materials was secured for the main canal.

4thly. The feeder was commenced within a short distance of the line between Pennsylvania and Maryland; contiguous to the southern counties of Pennsylvania, so as to form a ready conveyance for the produce of those counties to the canal, and to offer a very obvious mode of communication with the interior parts of that State, even to the Susquehannah itself, whenever its Legislature might choose to adopt it, as you will find mentioned in the memorial of the board to the Assembly of Pennsylvania.

5thly. The supply of the main canal with water so as to facilitate the removal of earth and materials, and to render every part of it navigable as fast as it was finished.

6thly. Great confidence was given to the directors by actual execution of a large portion of work, in a manner equal to any European canal, and the success of their future operations confirmed, by the part they had completed; especially as that part abounded in almost every variety of operations which occur in the general formation of canal.

7thly. Very important data for estimating the future progress and cost of the work were furnished by actual experience, on which far greater reliance could be placed than on any estimate founded on calculation only.

By actual measurement, and the sums paid on the feeder, it was found that one mile, the most difficult of all others, from its being nearly altogether formed through hard rocky ground, cost $13,000: and one other mile, perfectly level, and without any particular impediment, cost $2,300; from hence the general average would be reduced to $7,650 per mile. The estimate of the remainder did not appear to increase this average; but as parts of the outfit were almost inseparably connected with the cost of actual execution, and an allowance ought to be made for wear and tear of tools, &c. the board placed the average, as I have before mentioned, at $10,000 per mile, from a conviction that this sum was fully sufficient.

In applying the experience of the board thus obtained to an estimate of the main canal they justly considered the following circumstances:

1st. The entire change of country over which the main canal will pass, the very practicable nature of the soil, and its furnishing no rocky ground, morasses, steep hills, nor any obstruction whatever which can materially extend either time or expense.

2dly. The provision already made for it in point of outfit, stone, and other materials, and the great saving of labor by the water carriage of the feeder as I have already mentioned.

They deem themselves, therefore, fully justified in fixing the cost of the whole main canal, when completed, at $20,000 per mile; exclusive, however, of the locks, and such detached expenditures as I shall hereafter mention.

The first impediment which the president and directors experienced arose from the want of funds; at its first commencement the public and private zeal which appeared to support the work were so flattering that the board had no idea but the sum originally subscribed would be cheerfully paid, and whatever should be further required furnished them either by public donation or private subscription; so that they proceeded with ardor to fulfil the sanguine expectations formed of the work, sensible that it was necessary to avail themselves of the general impulse felt on the occasion, without suffering it to languish by neglect, and that if so much of it was executed as the existing subscriptions would admit, it must then be too interesting not to command the further sums necessary for its completion.

But though a considerable part of the subscriptions were paid, it soon became evident that a work of this kind, which required the toil and attention of several years to repay those who engaged in it, bore an unfavorable comparison with the banks, moneyed institutions, and private commerce of the United States, which gave immediate and large returns to capital employed in them. Hence the ardor of the subscribers was soon perceived to cool, excuses were formed for the delay of payment, and a large portion of those in the State of Delaware availed themselves of a supposed permission in the act of that State to delay their engagements. The opinion of six eminent counsels in the three States leave the board little room to doubt of the recovery of all the delinquencies, but it was in vain, under such circumstances, to proceed in a work which required immediate supplies of money. A general fear, originating partly in the failure of other similar works, and partly in the wishes of those who were desirous to be released from their subscriptions operated on the public, that as this work had not received the basis of public support it could not be carried into effect. To silence as much as possible these clamors, and regain the public

confidence, applications were made to Congress and the Legislature of the three States who had united to incorporate the company; but though a reception at first very flattering to their hopes was given to several of their applications, the ultimate delay of them all increased the despondence of the subscribers, and compelled the board to discontinue the work, under the full conviction that, without the patronage of Government, extended in some way to the institution, its operations cannot, for a long period, if ever, be resumed.

The experience obtained in making these applications leaves the board with little hope of obtaining any support but from Congress. Unhappily, though the canal is highly interesting to all the three contiguous States, yet it touches so much on their remote boundaries as to create but little local interest in the greater part of their representatives, and is viewed by all more as a national than a municipal undertaking. The city of Philadelphia has zealously supported, and still remains highly interested in its progress, but the representatives of Pennsylvania have so many local objects of the kind in the interior counties, that these are constantly brought into competition with it, so as to prevent its obtaining any aid from thence. The State of Delaware is too feeble in its resources to grant supplies for any work of the kind; and in the State of Maryland, although the interest of the counties contiguous to the Chesapeake are partial to the canal, the city of Baltimore and other parts of the State view it with no little jealousy.

You will perceive, sir, the various reasons on which the board have founded their applications to Congress in their memorials, and a paper annexed thereto, entitled "Observations on the Canal," printed for the perusal of the members when the application was made. These reasons rank themselves under three heads: 1st, The universal adoption of canal navigation by every great nation, both ancient and modern, and the immense influence they have had on individual happiness and public prosperity; 2d, The extensive benefit which they will confer on the people and Government of the United States; and 3d, The immediate benefit of the Delaware and Chesapeake canal, both as to its own actual effect, and as the foundation of similar works to great extent.

I am sensible, sir, that your own observation and knowledge of the canal navigation of Europe, and the prodigious assistance it has given to agriculture, manufactures, interior economy, and public revenue, will render it unnecessary for me to add any thing further on its history and general effects than merely to request your perusal of what has been offered on the subject in the papers I allude to, which may recall some facts to your recollection, nor am I less sensible of your disposition and superior intelligence in applying the experience and improvements of other nations to our own. But I shall beg leave to mention a few of the most prominent advantages canal navigation, and this canal in particular, offer to the United States, which have impressed themselves so forcibly on the president and directors, that they are induced to believe they cannot be too highly appreciated, and will impress an equal attention on the minds of others.

1st. The period when canal navigation is most useful to a country is in its infant or progressive state, when every improvement which can lighten expense or labor applies more beneficially than when it has already become wealthy and populous.

2d. Canal navigation is of peculiar importance when a country is verging to manufactures, or has commenced them, especially where mineral productions abound, and require exertion to connect them together so as to become useful.

3d. It is also of the first importance where a country of various climates and productions requires an interchange of those productions for support or the occupation of industry; especially where one district furnishes population, and others the means of employment.

4th. It is peculiarly useful when the increase of population and settlement of a country depends on the ready sale of agricultural produce, and that sale on commerce, to ensure conveyances to market by the easiest and cheapest means.

5th. Where countries are furnished by nature with numerous waters or streams which afford partial communications, canals are of the utmost value to connect them together, and complete those advantages which nature has furnished.

6th. The self-dependence of a nation is an object of the utmost value, that is, to create the same interchange among its various parts or provinces, as those parts must otherwise enjoy with other nations: by these means it becomes independent of the jealousy and hostility of foreign countries; it is fed, clothed, and supplied by means within its own command; the labor and industry paid for by one part enriches another; its people are kept at home; its minerals are opened, instead of paying other nations for them by purchasing their manufactures; and the general wealth and strength of a country furnishes resources to the Government which cannot be affected by foreign politics or hostility.

7th. It is a circumstance of no small consequence to the happiness of society for people of various and distant districts under one Government to be constantly and extensively mingled together for the purpose of traffic and interchange of their respective arts and productions, so as to polish the local habits or prejudices of different parts, and unite them in one general sentiment of respect and affection for each other, and for the Government under which they live.

In applying these observations to the present situation of the United States, I am sensible, sir, you will justly estimate their influence on the present moderate though increasing population of our country; the rapidity with which our manufactures may be extended by a ready communication between the several States, particularly the Southern States, which produce cotton and other raw materials, with the middle and Eastern States, which possess greater population, iron, and other manufactures; how material a ready and certain market for agricultural produce has become to the progress of settlement and population; how easily numerous streams, which furnish interior communications, may be connected together; and how great the importance, amid the injuries we are receiving from other nations, of increasing, by all possible means, our own interior resources and self-dependence, the intercourse of our citizens with each other, and their confidence in our General Government.

With respect to the immediate advantages of the Chesapeake and Delaware canal, I must beg leave to call your attention to the following facts:

1st. A line drawn from the city of Washington northeastwardly to Boston will nearly touch the cities of Baltimore, the course of the present canal, Philadelphia, the course of a canal from the Delaware to the Raritan, and the city of New York; hence it is obviously the most direct route through all the middle States.

2d. The first object accomplished by the canal will be to open a free intercourse between the Delaware and the Chesapeake bays and all their waters, the extent of which, and the immense traffic furnished by their produce, you will justly discern.

3d. The extension of the canal southward may be formed to embrace the trade of the Southern States.

4th. The extension northward by a canal from the Delaware to the Raritan connects the vast trade of New York, the Hudson, and Long Island Sound, with Philadelphia, Baltimore, and the Southern States.

5th. The most direct communications of the Atlantic coast of the United States with the lakes of Canada are from the head of the Hudson. One communication of this kind with Lake Ontario is now partially completed, and

another with Lake Champlain has been contemplated and found practicable. If they should be finished, (as no doubt they will be at a future period,) the vast trade of the northern boundary of the United States will be opened to their own ports on the ocean, and turned from the St. Lawrence which now forms its natural outlet.

6th. The line I have described extends nearly along the base of the first hills or rising ground from the ocean; from which it is greatly distant, so far as it crosses Maryland, Delaware, Pennsylvania, and Jersey; these hills also form the first line of country which abounds in streams of water for manufactures and in minerals. With the union, therefore, of machinery and raw materials, which may be formed by the canal, its whole course will probably become a seat of manufactures capable of being extended to an immense degree in the interior countries. Thus the produce of the coast will naturally be drawn to the interior, by numerous advantages beyond that of direct and safe conveyance only; and the communications of all the inland parts of the middle States, whether by canals or roads, will be directed to this canal and its extensions as a general route of traffic and conveyance.

7th. The produce exclusively furnished by the Southern States are cotton, rice, naval stores, and tobacco, to which for the present may be added coal. The middle States furnish in common with some of those to the southward corn, wheat, iron, and a variety of lesser and manufactured articles; and the Eastern States oil, fish, lumber, plaster, salt provisions, barley, &c. Of these the exchange is already immense, under the two unfavorable circumstances, 1st, Of a long and dangerous coasting navigation; and 2d, Of a direct conveyance between principal towns and rivers only, where they must be landed and conveyed to the interior country. How much, therefore, this interchange may be increased by the canal navigation, which at once offers a direct route free from the dangers of the ocean, and communicates directly with a large portion of interior, will, I am sensible, meet your consideration.

I shall beg leave to mention one object more which renders the canal of great and increasing importance; that is, as a military work during the revolutionary war this importance was severely felt, as it must again in any hostile contest with any other nation. There are many people now living who were employed in the conveyances across the Peninsula, particularly from Elk to Christiana, who describe the sufferings and inconveniences which the public experienced for want of a canal; when the coasting navigation became interrupted, and in fact destroyed by the British cruisers; the sources of supply, which in time of peace appear inexhaustible, became extremely limited; and the army, which was chiefly stationed in the middle States, from the ravaged and exhausted situation to which they were soon reduced, became almost wholly dependent on Maryland and Virginia for their provisions; added to which, nearly all the merchandise which eluded the vigilance of the enemy was landed in the ports of those States. The chief, and, indeed, the only safe conveyance for them was by the route I have mentioned, where it often occurred that the want of wagons and badness of the roads occasioned such delays as reduced the army to great distress. These delays were also severely felt on the march of the army southward, particularly on that to Yorktown, and must be again felt in similar circumstances.

Should a war occur with any European Power, the first means of annoyance it would adopt would doubtless be a blockade of our ports, particularly New York, and the bays of Delaware and Chesapeake. The intercourse of the Southern and middle States then again becomes reduced to the passes from Elk to Christiana, and from Trenton to Brunswick. These were seldom shut up during the late war, except when the enemy was in actual possession of the country; nor is it probable that any regular stations would be fixed by these cruisers so far from the ocean, or any thing attempted against them beyond desultory attacks, from which they might be completely defended. On this head I shall beg leave to offer the following remarks:

1st. Vessels attempting to form stations so high up the bays of Chesapeake or Delaware, would be subject to great inconveniences for the want of water and provisions, from the difficulties of navigation, and from the constant annoyance of gun-boats and other means of defence.

2d. The extremities or debouches of the canal might be fortified so as to resist any attack by sea or land.

3d. A powerful fleet of gun-boats might be kept to pass through the canal from one bay to the other, and to assist in the defence of the two extremities, or of any part which should be attacked.

4th. The two eminences of Gray's Hill and Iron Hill form strong military positions, and the hills on the northern side are admirably calculated for an army of defence to operate on the whole line of the canal.

5th. The canal itself offers a strong military work, and with the assistance of batteries on its northern bank gun-boats and an army of moderate numbers would repel any attack.

6th. An army stationed in its vicinity would be easily and directly conveyed by boats to almost any position in the middle or Southern States where its service would be required.

Respecting the finances of the present company, the sum necessary to complete the canal, the extent of aid, and the manner of furnishing it, if Congress should be pleased to grant it, I beg leave to offer the following observations:

The amount of the original subscriptions is two thousand shares at $200 each, or $400,000; the sums already collected and expended $103,000; leaving a balance of $297,000 for the future progress of the work.

The estimate for the full completion of the work, as I shall hereafter explain to you, is	$741,000
From which deduct the above balance of	297,000
It leaves the amount to be provided,	$444,000

What part of this sum Congress may be pleased to furnish will undoubtedly depend on their wisdom, and on the interest with which they may view the work. Should it appear to them of sufficient magnitude, doubtless its execution would be the most effectually secured by their furnishing the necessary amount; but in the papers I submit you will perceive the great stress which the board has placed upon the patronage, confidence, and support which would be afforded even by a more moderate aid, and that the success of the work would be ensured by its becoming an object of the care and assistance of the National Legislature. On this head the board place reliance on the following result:

1st. By a moderate aid from Congress the confidence of the subscribers would be restored, and no doubt their desire to complete their payments would become as great as their former disposition to delay them.

2d. New subscriptions for a further amount may be obtained, as a large portion of the public, especially in Philadelphia, view the work as of so much importance as only to delay engaging in it until it shall have received some public support.

3d. If any of the present subscribers remain delinquents, their shares would be forfeited and supplied by others.

4th. So soon as the public confidence is restored, a recommencement of the work made, and especially if any material part of it is effected, the board would be able to raise further funds, either by new subscriptions by loan, or by the various means authorized by the acts of incorporation.

5th. By first completing the western or Chesapeake end of the canal, and continuing it towards the Delaware, which is the most advantageous mode of procedure, every part of it will become productive as soon as it is finished.

The portage from Elk to Christiana and Newcastle being so much shorter as it is executed, vessels would of course enter, and proceed on the canal as far as practicable, and there unload, instead of unloading, as they now do, on the Elk river. This circumstance would undoubtedly confirm the confidence of the public in the work, by the appearance of business, and an early return of interest on the capital.

The manner of bestowing the public aid will, no doubt, claim your consideration; so that I shall confine myself merely to mention how it appears to the board that it may most beneficially operate.

This mode would, in their opinion, be in a loan, or in a subscription of a number of shares to the present company.

The present organization, and the powers given by the acts of incorporation, appear amply sufficient for the conduct and completion of the work.

A number of subscribers, so as to form a very important object, are engaged in this organization, a considerable part of their subscriptions paid, and expended, and the system of operations formed under it.

From various existing jealousies between the three States, it was not easy, originally, to obtain their union in forming the company. These jealousies still exist, and any new organization would be attended with material difficulties, where there are so many parties interested; nor, indeed, would it be safe to commit the institution to that variation of sentiment which generally prevails on such occasions, both in public bodies and among individual subscribers.

The present company is modelled upon those which have been universally adopted in England and other Governments, where canals have been carried into the most complete effect, by committing them to institutions made perpetual for the express purpose, in which public duty is united with private energy and interest.

The duty of the directors of this work has been, and must continue to be, an arduous one. The purchases of land, water, and numerous negotiations, always occurring in the neighborhood of the canal; the conduct of the work so as to produce the most local and general advantage; the system of employ for a large number of persons; and the administration of the finances, form a large portion of duty, distinct, in a great degree, from the operations of the engineer, and require a board, which unites men of knowledge and influence in the country itself, with others, who may prevent the effect of local influence, and guard the distant and general interests; or, from their knowledge or experience, may unite and assist in the execution by their advice and co-operation with the engineer. Such a board can, perhaps, always be best selected by the stockholders, of whom they are the proper representatives, and who will preserve a great degree of vigilance over their operations; and Congress would undoubtedly claim a proper share in the choice of these representatives by their subscriptions.

Such alterations as it may be useful to obtain in any of the acts, and particularly some modification of that of the State of Delaware respecting the tolls, may be applied for and obtained, at favorable periods, without hazarding the general structure of the act itself.

The following circumstances appear highly favorable to a resumption of the work at this moment:

1st. The fear of our being engaged in war, and the great importance of this canal in such a state, renders it a subject of much conversation, interest, and anxiety at present.

2d. The embarrassed state of our commerce, and of the moneyed institutions depending on it, leaves a greater sum of private capital unemployed than at any other period; and the fear of a war creates a solicitude to place it in funds which are likely to ensure its security.

3d. If our present embarrassed situation continues, a great number of laborers and poor people must become idle; and such a work would afford an excellent opportunity of employ, at a considerable reduction of the present price of labor.

4th. By affording assistance to one work already begun, and which appears to be the basis of a most useful and more extensive system, the wishes and anxiety of a large portion of the people of the United States to see a part of the public funds devoted to internal improvements would be highly gratified; and such assistance by the public at this juncture would probably create a disposition to convert the money and attention of the country, generally, to such purposes, in lieu of other speculations.

I shall here close the general observations I have taken the liberty to make, and reply to the queries in your printed circular.

1st. The points united by the canal are Welch point, at the junction of Back creek with the Elk, on the side of the Chesapeake, and Christiana creek, about three miles above Wilmington, on the side of the Delaware; the distance, by the line of the canal, is nearly 22 miles; the depth of water, nine feet, at low tide, in the Christiana, and more at Welch point, where the canal terminates.

The feeder begins on Elk river, about four miles south of the Pennsylvania line, and ends on the summit level of the canal, about ten miles from its western extremity. The length of the feeder is nearly six miles, and is a navigable canal, of nearly three and a half feet draught of water.

2d. The canal rises from Welch point in one mile to the elevation of sixty-eight feet above the tide, and continues of this elevation seven miles; it then rises six feet more, (altogether seventy-four feet,) and continues thirteen miles further, to within one mile of its termination on the Christiana; in which mile it obtains its whole descent. The feeder commences on Elk river, at an elevation of ten feet above the highest level of the canal, consequently, eighty-four feet above the tide, and continues on this level to a lock at the main canal formed to supply it.

3d. The number and positions of the locks are not yet positively determined; but it is most probable the board will adopt Mr. Latrobe's plan, which consists of eight locks on the western descent, near Welch point, one lock on the summit level, and nine on the eastern descent to Christiana; these locks to be placed in tiers or clusters, of two or three together, as the ground may suit; the locks to be eighty feet long, eighteen feet wide, and eight feet of water over the sills of the gates; the descent of them, altogether, being seventy-four feet, will be divided on each side, as the ground may best suit, more or less in some of the locks, but on an average eight to nine feet descent in each; the locks to be constructed of hewn stone, laid in tarras; the contents of each lock will be eleven thousand five hundred and twenty cubic feet of water, and the number of them, altogether, eighteen, besides the one on the feeder.

4th. The supply of water is obtained from Elk river, and there appears no doubt of its being amply sufficient for a large lockage. The reduction of large streams of running water to actual cubical measurement is one of those operations which has baffled the best mathematicians in Europe, and has not yet been satisfactorily accomplished. Mr. Latrobe, however, has ascertained (perhaps as accurately as can be done) a quantity in Elk river equal to a daily supply of one hundred and forty-four locks full, or to the passage of about twenty-five boats per day at each end. To his measurement may be added a large quantity of waste water which may be obtained, but could not be measured. The elevation of the feeder and its length I have already given in answers Nos. 1 and 2. From the ample quantity and free passage of the water, no reservoir has been deemed necessary, except one near the lock on the feeder, intended to hold a sufficient supply in case of accident or repairs on that part of the work. This reservoir contains about thirty acres, and may be extended to one hundred and fifty acres. Other reservoirs

to a large extent may also be formed; and the two streams of Christiana and White Clay creeks may, if necessary, hereafter, be brought to the canal by feeders similar to that of the Elk. Altogether, these form a resource which can leave no doubt of a supply for the canal with as much water as it can ever require.

5th. No part of the route depends on the natural or improved bed of any stream whatever, except as to the supply of water.

6th. The dimensions of the canal have not been positively determined, but the plan which will probably be adopted is as follows:

50 feet, width on the water line; 26 feet, width at bottom; 59 feet, width from bank to bank; 8 feet, depth of water; 3 feet, rise of banks above the water; 20 feet, width of banks on each side, for towing paths, footway, &c. Thus the whole width of the canal and banks would be about 100 feet, and its depth from the top of the bank about 11½ feet.

It has also occurred to the board that, in forming the canal, they might at the same time construct on one of its banks, independent of the towing path, a turnpike road, which would be accomplished and attended with the following advantages:

1st. This road would secure the passage on the route of the canal by wagons and carriages, whenever the canal should be shut by ice, accident, or repairs.

2d. As the road would be perfectly level, and directly across the peninsula, it would become the customary route for all travellers; and the toll on the road would greatly assist the revenue of the canal.

3d. In forming the banks of the canal, the road would be constructed in many places at little or no expense; and throughout at no expense additional, compared to its use or the customary cost of such roads elsewhere.

4th. The canal itself would keep the road perfectly drained.

5th. The easy transportation of stone, gravel, and all materials by water on the canal, would render the repair of the road very cheap.

6th. No particular size or construction of vessels is fixed for the use or navigation of the canal; but the canal itself is formed for the passage of all vessels under the draught of seven and a half feet of water, which depth will accommodate the greater part of the craft or common trading vessels used in both bays, as that is the depth of water most usual at the landings on the rivers and creeks where produce is embarked. This depth is also sufficient for vessels of forty to seventy, and even one hundred tons, as it is probable that, when the canal is completed, most vessels will be constructed in their dimensions so as to pass through it.

7th. There are no aqueducts on the whole work of a large or expensive kind. The streams which are to be crossed are in general small. There can be no tunnels nor permanent bridges, as the construction of the canal is for vessels with masts. The bridges will all be either swivel or drawbridges; and the great public roads will, wherever it is possible, be passed under the canal by road aqueducts, which are the chief kind that occur, except those of small size, such as culverts and drains.

8th. There are no particular difficulties to be encountered in any part of the work; all that exist are in the course of the feeder, and have been already overcome; the whole country of the main canal has one uniform soil of loam, more or less inclining to sand, such as is general throughout the peninsula below the hills.

9th. The plan of the canal has been formed upon the well-known structure and plan of similar canals in Europe, without attempting new experiments which might not succeed. This work being for the passage of vessels navigating larger waters, from one bay to another, differs, of course, in size and construction, from small interior canals; but there are several works affording models and principles precisely suitable to it, particularly—

1st. The canal of Languedoc, the great parent of the canals in Europe, though executed one hundred and thirty years, exhibits, at this day, excellent specimens for construction, in far the greater part of its detail.

2d. The canal of Scotland, from the Frith of Forth to the Clyde, on the same principles as the canal of Languedoc, and with some improvements in its locks.

These, as well as the structure of other European canals, are comprised in the knowledge and education of a regular scientific engineer, and form the basis of the present plans, without limiting the genius of the engineer too closely in its application. Such as the plan is, the board believe it as perfect as can be adopted, nor have they yet discovered any points on which it can be advantageously altered, except as to a few objects on which, from the outset, they have reserved their ultimate decision. The first of these consists in some partial deviations of the line, as matters of practice and calculation, of which they wish to acquire some further experience. The second is, the termination of the eastern extremity or debouche at Newcastle or Christiana; this question respects only the last five miles to be executed; and, sensible that their present decision would admit of a future review, under much better circumstances, the board thought proper to lay it at rest, (as a subject which was rapidly generating local dissensions and parties in the country,) by deciding what now appeared to them, under all circumstances, the most eligible course for the canal.

10. This and the thirteenth query have a strong connexion, the object of them appearing to be an exact view of the present carriage across the peninsula; the amount of articles carried; their actual and comparative expense; and the probable amount of tolls or revenue arising from the canal, when executed.

The mode of estimating the general profit or result of any work of the kind, as a turnpike road or canal, where they are contemplated in Europe, naturally divides itself into two distinct heads:

First. When the proposed improvement is founded upon any other established carriage already in practice.

Second. Where it is founded for the purpose of a new conveyance altogether, not used before, or for new articles on an existing conveyance.

The first of these principles is the basis of calculation on turnpike roads, which generally take up an existing carriage, and contemplate their revenue by tolls for improving the conveyance.

But the calculation of revenue on canals is chiefly founded on the second principle, that is, of actually creating a new carriage where none existed before.

The canal of Languedoc opens a communication from Cette, on the Mediterranean, to Toulouse, and from thence by the river Garonne to Bordeaux, and the Bay of Biscay. On this route, it was before utterly impossible to convey the wines, oil, and other articles, which now form the trade of the canal, by any land conveyance; they either passed round by sea, or were not conveyed at all.

The canal of the Duke of Bridgewater (the first executed in England,) was not founded on any existing carriage, but to convey coal from his estates at Worsley to Manchester and Liverpool.

The canal from the Frith of Forth to the Clyde was intended to open a communication from the Eastern ocean to the Irish sea, where no land carriage of consequence before existed.

A new canal, now in execution, from the Eastern to the Western seas, through the upper lakes of Scotland, intended for the passage of the British fleet, in place of going round the island, is still more new in its principles, as no sort of land carriage could ever accomplish the same object.

It is true that canals generally take up all the land carriage in their vicinity; but the calculations of them are never formed in the outset upon that carriage, and this for very obvious reasons:

1st. That land carriage is in itself confined to very few objects comparatively, consisting of passengers and articles of value, or of little weight or bulk.

2d. On all heavy or bulky articles, such as coal, iron, and other mineral productions, lumber, and heavy merchandise, canals, in a great degree, create their own revenue, by conveying them where they were very partially or not at all carried before.

3d. Where canals open a passage from sea to sea, for the conveyance of large vessels, they are wholly independent of any comparison with land carriage, but depend on a calculation of the time, expense, and danger of coasting navigation. If, for instance, a canal was formed across the isthmus of Darien, it could be compared with no circumstance but that of the navigation around Cape Horn or the Cape of Good Hope.

In examining the probable result of the Chesapeake and Delaware Canal, it appeared so obvious that, from the present carriage across the isthmus, and what must arise from its execution, of a kind altogether new, the revenue produced would so fully repay a large interest on its cost, that it was thought unnecessary minutely to examine the amount of the present carriage.

Since, however, it appears proper to collect data from every just source, and the queries you have formed demand it, I have endeavored to obtain information, and shall submit to you the amount of the present land carriage, its actual and comparative cost, with that of the canal, and the probable extent and sources of future increase, when the canal is formed.

The present land carriage is performed at a number of passes from that of the Christiana, southward, through the whole extremity of the peninsula.

The first port which is an object of attention is Newport, on the Christiana.

The carriage from this port to Philadelphia is now performed by two vessels, in constant employ, of about forty-five tons each. These vessels convey, annually, to Philadelphia forty-five thousand barrels of flour, of which, however, a large part comes from Columbia, Lancaster, and Chester counties, not within reach of the canal, except by its extension into Pennsylvania. On an examination with the consignees of the flour, they estimate one-third of the above amount as derived from sources so near the canal, as in future to be conveyed by it; that is, fifteen thousand barrels, and the cost of conveyance, at five cents per barrel, is seven hundred and fifty dollars.

The next port is Christiana bridge, which was formerly the greatest of all the waters across the peninsula; the carriage here has, however, lessened within a few years from causes which a canal would restore: 1st. from the numerous mills on Elk river and its vicinity, transmitting their produce to Baltimore, rather than pay the land carriage across to Christiana; 2d. a large part of the supplies of wheat, formerly brought to the Brandywine and Delaware mills, now remain on the Chesapeake, owing to the price of land carriage; 3d. a number of passages below are more used than formerly.

There are now four vessels in constant trade from Christiana to Philadelphia, which convey annually twenty thousand barrels of flour, one thousand hogsheads of meal, and one hundred and fifty tons of iron; and their return freight from Philadelphia is equal to one-third of this amount. In addition to this, there has been, for many years, conveyed across two hundred and fifty thousand bushels of wheat, and two thousand hogsheads of tobacco annually.

The estimate of all the carriage across is, therefore, as follows:

Flour—20,000 barrels, at 20 cents,	$4,000
Meal—1,000 hogsheads, equal to 5,000 pounds, at 20 cents per pound,	1,000
Iron—150 tons, at $2 per ton,	300
Wheat—250,000 bushels, at 6 cents per bushel,	15,000
Tobacco—2,000 hogsheads, at $2 per hogshead,	4,000
Back freight,	1,766
	$26,066

The next carriage is from Newcastle to Elk, which has been lately adopted by the stages between Philadelphia and Baltimore, and is used both for passengers and goods; the latter, however, consist chiefly of merchandise, of light and valuable kinds, exchanged between the markets of the two cities.

Of these stages there are two distinct establishments, one called the old line from Newcastle to Frenchtown, on the Elk, above the intended termination of the canal; this line employs three packets on the Delaware, and four on the Chesapeake; the other is the new line which runs to Old Court-house point; this employs also three packets on the Delaware, and four on the Chesapeake. Each line has one packet, arriving and departing six days in every week, except when prevented by ice, and both passengers and goods are conveyed directly across by land, the one in land stages, and the other in wagons. Thus there are two packets on the Delaware, and two on the Chesapeake, which arrive daily, and the number of days they have plied yearly has been from two hundred to two hundred and fifty; taking the lowest number, the aggregate of four packets is eight hundred passages per annum.

The amount of carriage received by the old line, before the other was established, for the entire freight and passage of one year, was upwards of $30,000, of which one-half, or $15,000, was paid for the land carriage.

The proprietors of the new line have not favored me with the amount of their receipts, owing, perhaps, to some jealousy arising from their recent establishment; but both of the lines are conducted with spirit, and appear to increase in business, and I am informed by persons well qualified to judge, that, although neither of the two establishments receive quite as much separately as one did formerly, yet both of them united are considerably more, especially as, from a competition in the business and some reduction of prices, the carriage has increased. I am, therefore, justified in placing the whole sum now received at least at $50,000, or the land carriage only at $25,000.

The mode of ascertaining the freight on merchandise is *pro rata* on a variety of different packages, which are not weighed, and, therefore, the number of tons is not exactly attainable. On each line there are, however, from five to eight wagons; the employ of the old line alone required constantly eight wagons, but the two together may now be estimated at six each, or twelve altogether. These wagons carry about two tons each, and the hire of them $4 per day; they give, therefore, pretty accurately, the tonnage of the goods and price per ton.

Twelve wagons, of two tons each, give twenty-four tons per day, carried each way, which is forty-eight tons, for two hundred days, or nine thousand six hundred tons per annum, at $2 per ton, is $19,200.

The number of passengers are not given me, but they employ four stages constantly, and sometimes more, and from the receipt and thriving state of both lines, cannot be less than five passengers in each, or twenty altogether per day, making four thousand per annum; the price of passage for the distance by land is fixed at $1 25 cents: so that the gross amount may be fixed at $5,000, which, added to the whole produce of the land carriage at this pass, amounts to $24,200.

The next route in order is that from Appoquinimink creek to Sassafras river. Here also a line of stages is employed between Philadelphia and Baltimore, which employs two vessels on the Delaware, and two on the Chesapeake. This line being shorter by land, and a greater proportion of its distance by water is more used for goods, though less for passengers, than that of Newcastle, its actual amount I am not furnished with, but, from the estimate of intelligent persons, well acquainted with it, I am authorized in placing its gross amount, at least, at one-half of that of the Newcastle route, or $12,100.

Appoquinimink is also a great port for the factorage and deposite of wheat and corn for the Philadelphia market and Brandywine mills, as well as other produce, a large part of which is brought over, by land, from the waters of Bohemia, Back creek, and Sassafras, on which it would be embarked, and pass by the canal, if established; the amount of this produce is well ascertained to amount to sixty thousand bushels of wheat, and eighty thousand bushels of corn, making one hundred and forty thousand bushels, of which at least one-half comes from Maryland, or seventy thousand bushels; and the price of carriage is seven cents per bushel, making $4,900, which, added to that of the stages, makes the gross amount at this pass $17,000 per annum.

From Duck creek or Smyrna to the head of Chester is the next pass. The former place is, like Appoquinimink, chiefly a depôt for the produce collected for Philadelphia and the Delaware Mills. The produce is ascertained to be as follows: eighty thousand bushels of wheat; one hundred thousand bushels of corn, one-half of which also is brought from Maryland, at the expense of nine cents per bushel, and amounts to $8,100.

Jones's creek or Camden, in the same manner, collects and furnishes about thirty thousand bushels of wheat, of which one half is brought from Maryland, at a carriage of ten cents per bushel, making altogether $1,500.

Below this portage, the width between the two bays becomes more extended, and the carriage too great to be borne on produce from one water to the other, until the peninsula is crossed by the line of Virginia, when it becomes again very narrow; in all this space, however, it is well known that considerable quantities of produce are brought to the Delaware landings, which would be laden with more ease on those of the Chesapeake, but not wishing to enter into calculations where no just estimates are furnished, I shall omit them, and make a brief summary of what is already stated:

At Newport,	$750
At Christiana,	26,066
At Newcastle,	24,200
At Appoquinimink,	17,000
At Duck creek,	8,100
At Jones's creek,	1,500
	$77,616

In calculating the number of tons from hence, as but a small proportion of the amount is paid for passengers, and the carriage on the greater part of the articles is taken *pro rata*, the number of tons may be safely estimated at forty thousand.

In drawing deductions from these premises, they appear to be properly considered under three distinct heads:

1st. That of the present carriage, as relative to the country and amount of saving, which may otherwise be more beneficially employed.

2d. The relative saving of cost on produce on articles conveyed.

3d. The comparative benefit as to the canal, and the amount of revenue thereon.

In considering the first of these heads, I shall endeavor to form an estimate of the capital employed in the present carriage.

To transport forty thousand tons of goods across the peninsula, I shall take the number of days in which the Newcastle stages are known to be employed, viz: 200; and this will be a fair one for all the others, after making allowance for bad weather, harvest, and other usual occupations of the country. To convey forty thousand tons, therefore, in two hundred days, will require two hundred wagons, each of which may be estimated at $500, equal altogether to $100,000 capital.

In the calculation of the present land carriage, there are sundry additions which may be made, actually sustained by goods, the amount of which is very considerable, although not easily estimated; they are as follows:

1st. The delay of vessels at each end in unloading and loading again.

2d. The expense of such relading.

3d. The loading and unloading in stores at each end, and the storage, to which may be added waste and damage.

All these unavoidably occur in discharging cargoes of vessels, carrying them in an intermediate speed by wagons and lading them again; and the amount of this additional expense will equal, if not far exceed, the whole cost of passing them by the canal.

Hence it is obvious that an annual saving in capital of $100,000, and of labor, to the amount of $77,616, will be gained by the canal, immediately applicable to agriculture, as both capital, horses, and men, may be more beneficially employed in cultivation, especially as the peninsula is by no means populous, and would derive vast advantages from its situation in an extension and improvement of its agriculture.

Under the second head, viz: the benefit to produce and articles transported, it is obvious that the saving of $77,616 operate in the following manner:

First. As to the produce of the country, it will lighten the expense on wheat, corn, and other articles, to the amount of six to ten cents per bushel, or from six to ten per cent., and other articles in proportion.

Second. As to goods conveyed across the peninsula, it will lighten them at least to the amount of $2 per ton, besides other great advantages I shall mention, in the comparative estimate; and this saving, it will be seen, is not only an object of importance on all articles, but constitutes a profit on those which are bulky.

On coals it is equal to seven cents per bushel, or 25 per cent.

On salt it is equal to five cents per bushel, or 10 per cent.

On wheat and corn, from six to ten cents per bushel, or from 6 to 10 per cent.

With respect to the third head, or comparative saving by the canal, it may be considered on two principles:

1st. The well-known and established difference between land and canal carriage, as given in a variety of authorities and calculations carried into effect in Europe.

2d. The actual saving on the present canal, which is shown as follows:

The cost of transporting a cargo of fifty tons from Newcastle to Frenchtown.

Fifty tons in twenty-five wagons, at $2 a ton is,	$100 00
Delay of the vessel in loading and unloading at the extremities of the canal, one day each,	10 00
Cost of loading and unloading fifty tons,	10 00
	$120 00

Cost for the Canal.

One vessel of fifty tons, requiring one man and two horses, at the rate of three miles per hour, or seven hours,	$ 3 00
Tolls on fifty tons at fifty cents each,	25 00
	$28 00

To which may be added as follows:

1st. The great saving of storage, waste, and damage, which, upon heavy goods, such as coals, salt, grain, liquors, &c., is highly material.

2d. Pilfer or robbery where articles go through a number of hands, has been found so material in England, as actually to constitute in itself a preference to that kind of carriage where the transfer by one conveyance gives an immediate responsibility from one party to the other direct as in vessels by sea.

3d. Despatch and the certainty of conveyance may be reckoned equal to the saving of expense. In speculations between the markets of Philadelphia and Baltimore, for the purchase of articles abounding in one, and wanted in another, the principle on which they are founded is more the certainty of bringing them to the place required in a short time, than the expense of it. A vessel, for instance, may commence loading in one of those ports, and depend for part of her cargo to be purchased and brought from the other. In these cases the articles wanted would be brought with certainty in three or four days, and of course would enable a purchase or speculation to be made. But by the present route, independent of expense, the delay of transportation by two water passages, and one intermediate land carriage, is such as to prevent all business of this kind, or to limit it to a few articles, and small amount.

4th. The difference between a single freight and a double one forms an immense saving. We daily see how far articles once embarked are conveyed with a very small addition of freight; goods from Europe are brought for twenty cents per cubic foot, whereas the price from Philadelphia to Baltimore is equal to twelve cents on measured goods, not above one-twentieth part of the distance. Coals have been brought from James river to Philadelphia upwards of three hundred miles, for eight cents; whereas the freight thirty miles on the Delaware is four cents, and the whole freight from James river by sea would not pay the land carriage, waste, &c., across the isthmus.

If a vessel was thus loaded at James river, or any water on the Chesapeake, she would probably proceed the whole distance to Philadelphia by the canal, for the same or a very small additional freight to that which she obtains to the head of the bay, because at Philadelphia she would secure a ready market, more despatch, and a return freight. A vessel from Philadelphia to Baltimore would, in the same manner, proceed through with little additional freight, and for the same reason; hence it is obvious that the canal would produce a saving not only of the present land carriage, but a material one on the whole transport by water.

Having thus examined the probable product of the canal so far as founded on the present carriage, I shall examine the sources of revenue of a new kind, formed by the execution of the canal itself.

The first is that arising between the cities of Philadelphia and Baltimore.

In these markets it almost continually occurs, that many articles are cheaper or in greater plenty in one than in the other; hence would arise an immense interchange upon the common principles of commerce, of all sorts of articles from the ease, cheapness, and certainty of communication.

2d. The produce of the Chesapeake would most probably be attracted from all its landings towards the head of the bay by the advantage of the two markets of Baltimore and Philadelphia being nearly at equal distances from the entrance of the canal on Elk, where it is also probable that factors for both those cities would ensure a constant market.

3d. I have already mentioned, and it would be tedious to repeat, the number of productions on each bay, which would form articles of traffic; but there are some of so much importance as to be worthy examination, and in particular the article of coals.

The only place where this production is now found so near the Atlantic waters as to be capable of immediate transport is on James river; the quality is excellent for all manufacturing purposes, and, if properly selected, equal to any foreign coal for domestic uses. The increasing price of fuel in all the maritime cities must soon create a dependence on it for both purposes, and it is daily so much increasing in use, that it must command an immense carriage in which a minute saving of expense will be of the utmost consequence.

I shall indulge a calculation on this article, which may serve for many others. There is now brought to the city of Philadelphia nearly five hundred thousand bushels per annum, great part of which is from Europe. I have already mentioned the increase of manufactures, and the probability of their being greatly extended, both there and in the country on the north bank of the canal, from the numerous mill streams, iron, and other advantages with which it abounds; I shall, therefore, suppose a demand for coals from all these sources, equal only to the quantity necessary for the domestic use of Philadelphia.

This city is ascertained to contain upwards of thirteen thousand houses, whose supply of fuel cannot be estimated at a less average than fifteen cords of wood per annum, which is one hundred and ninety-five thousand cords, independent of manufactures. Taking it, however, at two hundred thousand cords of wood, (and it has been ascertained to be still greater,) and then equal to twenty bushels of coal per cord, it will produce four millions of bushels, which, at thirty bushels per ton, (the weight of the best English coal,) is one hundred and thirty-three thousand three hundred and thirty-three tons; this would require two thousand six hundred and sixty-seven cargoes of fifty tons each, and two hundred vessels of that burthen making thirteen passages per annum. The revenue to the canal from this carriage only, at fifty cents per ton, would be $66,666; besides a large return freight by the same vessels.

Having stated this estimate, you will, sir, make such use of it as you think proper; in order, however, to show that it may be relied on to a great extent, I shall state the causes from whence this source will probably claim a preference for the supply of Philadelphia, and the district I have mentioned, to any other.

1st. The coal of James river was regularly supplied at Philadelphia before the present advance of labor, arising from the war in Europe, in large quantities by vessels regularly employed in the trade, at twenty cents per bushel, at which price the carriers made a decent profit.

Coals cost in Liverpool eighteen cents per bushel, and pay a duty of five cents, so that, including freight, they are sold to a loss under thirty cents per bushel.

There are no coals yet discovered on the navigable waters of the Delaware, and all the country contiguous to them, in which they appear, is so distant, that even by improved carriage they cannot be brought to Philadelphia cheaper than those of James river. Indeed, the price of twenty cents, equal to 10*d.* sterling, is not deemed high, even in England, except in the neighborhood of the coal pits. It is allowed, also, that an improvement in the conveyance at James river, which will no doubt be effected, will lessen the price there.

I shall but barely mention the limestone in the vicinity of the canal, which is wanted on all the ports of the Chesapeake, the iron with which the southern counties of Pennsylvania abounds, the extension of the canal into Pennsylvania, for the produce of the Susquehannah, Lancaster county, &c., and the great accession of revenue, if the same system of canals should be extended through Jersey and the Hudson.

In order to form an ultimate conclusion of the revenue of the canal from these actual and probable sources, I shall beg leave first to answer the eleventh and twelfth queries.

11th. The capital contemplated by the acts of incorporation was two thousand five hundred shares of $200 each, or $500,000; with liberty, however, to raise any further sums necessary.

The amount subscribed is two thousand shares, at $200	$400,000 00
Of which there has been expended	103,000 00
Leaving the present unexpended capital of	297,000 00

And the further requisite capital to complete it, $444,000.

12th. The following is the estimate of the future work from the best opinion of the directors and engineers:

To complete the payment of the water rights on Elk river, and land on the feeder,	$40,000 00
To complete the whole work on the feeder,	30,000 00
To purchase the land on the course of the main canal, four thousand two hundred and fifty acres at $12	51,000 00
To complete the whole extent of the canal, fit for actual operation, (except locks) $20,000 per mile for twenty-two miles,	444,000 00
To complete eighteen locks, at $10,000 each,	180,000 00
Total,	745,000 00

I must beg leave, respecting this estimate, to mention, that being aware of the frequent fallacy of previous estimates, the eagerness, however, with which they are required, and the disposition to doubt and exaggerate them, the present one is formed so as to contemplate the most extended expense of the work, subject only to those casualties which will attend previous estimates of any work whatever.

13th. I shall now offer a summary of the foregoing statements in order to show the revenue necessary on the canal, and what may be expected from it.

There being already expended,	$103,000 00
And the estimate of future work,	745,000 00
Forms a total of	848,000 00
Or, to use even numbers,	850,000 00
The interest of this sum, at six per cent, is,	$51,000 00
Repairs, estimated by the engineer,	10,000 00
Attendance on the locks, clerks, &c.,	10,000 00
	71,000 00

To defray this expense one hundred and forty-two thousand tons at fifty cents must annually pass through the canal, which would require about one hundred and forty vessels of fifty tons to pass twenty times each way in the year; that is, an employ equal to one hundred and forty vessels, making voyages of about three weeks each all the navigable part of the season.

In order to judge how far this revenue may be expected, before I mention any other circumstances, I shall take a brief view of the number of vessels employed in the navigation of the two bays.

It has been ascertained in some late calculations of the trade of New York, that there are eighteen hundred craft employed in it. This I mention as applicable here, no further than to give probability to the calculations on the Delaware and Chesapeake.

I have examined the enrolment of licensed vessels at the port of Philadelphia, where there are few coasters, but those of the bay and river, and it gives an amount of 10,000 tons, divisible into 383 vessels of various dimensions, equal to 200 vessels of 50 tons each.

But the licences at Philadelphia exhibit a small proportion of the Delaware navigation. The eastern shore of the Delaware is wholly in the State of New Jersey, and employs a number of craft, known, from the exhibition of their licences at the Philadelphia custom house, to be greater than those of Pennsylvania. Two-thirds of the western coast, from whence nearly all the great transport of produce exists, is in the State of Delaware. The vessels are nearly all owned and registered in the States which comprise the ports or landings from which they sail; hence it cannot appear exaggerated to fix the number of vessels in Jersey and in Delaware, each, equal to that of Philadelphia, or 600 vessels altogether.

The estimate of the Chesapeake, I am unable to make from any other source than a view of the number of ports and landings on the waters of that bay; from hence I place them at 1,200, forming a total of the two bays equal to that of New-York, or 1,800 vessels.

Your information and opportunity will enable you, sir, to form a more complete view of this estimate, if correct, as I am induced to believe it. The result is, that less than one-twelfth part only of the vessels now employed on the two bays will be necessary for the trade of the canal, in order to raise the revenue I have mentioned.

On this head I shall mention a few other facts:

1st. The revenue contemplates an increase only of $3\frac{1}{2}$ times the present land carriage.

2d. The capital employed will be little or no addition to that already vested in the present navigation.

3d. The tolls, on which the revenue is calculated, are very low. On most of the canals in England a toll is taken on coals, limestone, and such articles, of $2\frac{1}{2}d.$ on entrance, and $1\frac{1}{2}d.$ per mile per ton, which would be equal to 70 cents per ton on this canal; 50 cents per ton is equal only to $1\frac{3}{5}$ cents on coals; but the principles on which all canals are established are, to bring articles of small cost cheaply to market, rising, in some proportion, to their value; thus manure, gravel, sand, and stone for roads, are often exempted from toll altogether, and coal, lime, &c., placed far below a medium toll. A ton of tobacco, worth $120 to $150, will very properly pay more than a ton of coals, worth $6. These principles are also established by the acts incorporating the present company; and from

the variety of sources I have adduced to show the saving of expense, they will be justly carried into effect; so that the average toll will be far more than I have mentioned, and, of course, render a less amount of tonnage necessary.

4th. Passengers will form a great source of revenue when packets are established to run, without interruption, from so large a number of ports on the Chesapeake to Philadelphia; this may be verified from the cheapness and number which now pass from Baltimore to Philadelphia.

5th. The future extension of canals offers itself pointedly on this head, as well as every other; in fact the probable amount of passage on the canal may be better conceived than estimated, by an idea of the vast commerce of the two bays being thrown into one common mass, as they would be, if a natural communication existed.

14. Your last query will be so much better explained by the acts of incorporation, than any abstract I could form of them, that I shall transmit, and beg leave to refer you to, the acts themselves.

If, in addition to these observations, you will have the goodness, sir, to peruse the printed papers, it will furnish you with all the ideas which have occurred to the board or the committee. In the numerous calculations I have offered, you will justly discern those which are, in themselves, of a speculative kind, founded on opinion, and those for which just or probable data was obtainable. Of such as respect the execution of the work, you will, I presume, obtain a more detailed account from Mr. Latrobe, with whom I have compared most of those I offer on that head; and such as apply to the present land carriage, and other facts I have obtained, either from actual documents, where I could procure them, or from men of the best information and judgment; nor am I conscious, in any, of having placed them before you more favorably to the interest of the work than they merit.

I must now, sir, most sincerely beg your indulgence for the length of this letter; it has arisen solely from a desire of placing the subject fully before you, sensible that its most important features would be best selected by your own judgment. Having formed, in early life, a high idea of the advantage derived from public works of this kind, and indulged a desire to see the one in question effected, I availed myself of the opportunity afforded by seven years' residence in Europe to visit almost every canal in operation, not with an intention to assume a professional character, but to gain such knowledge of the principles, construction, and effect of these works, as might enable me to assist in applying them to my country. These facts I mention from no motives of personal vanity, but solely to impress upon you, that the observations I have made are not founded on hasty or speculative opinion, but are the result of opportunity, inquiry, and attention. Among the directors, with whom I have the honor to act, are several gentlemen who possess similar advantages, and others who unite the best knowledge of the country and attachment to its interests. In the short space to which their labors have thus far been confined, the work has received from them as fair a portion of disinterested application as its importance demands; and, in committing its interests to your care, I am sensible, sir, they all feel that no one can discern more fully than yourself, its advantages to our country, and the character it will impress on the Government, under whose auspices it is revived.

I have the honor to be, with high respect, your obedient humble servant,

JOS. GILPIN.

The Hon. ALBERT GALLATIN, *Secretary of the Treasury.*

A. No. 4.

Answers to queries respecting the Dismal Swamp Canal.

NORFOLK, *November* 17, 1807.

To the 1st. From Deep creek, a branch of the Southern branch of Elizabeth river, about seven miles above Portsmouth, is the commencement of the canal; from thence it runs to Joyce's creek, a branch of Pasquotank river in North Carolina, where it ends; the distance is twenty-two miles, agreeable to the plan herewith exhibited.

2d. The swamp, through which the canal passes, from Deep creek to the Northwest river run, is nine miles, and is nearly on a level, a little highest about half-way, and the elevation in this distance cannot exceed two feet, and it is not perceivable by the eye; about the same on the other end.

3d. At present there are only two locks on the canal, one of which is three and a half miles from Deep creek, the other, six miles from the south end of the canal; there will require another to be erected about half a mile from the south side of the Northwest river run, and one at each end of the canal to communicate with the Creeks; these will be very sufficient. Those now built are about seventy-five feet long, nine feet wide, and six feet deep, the sides are built of square juniper timber, which is considered much more substantial than framed ones, they cost about three hundred dollars each; those to be built at the ends of the canal will require to be more substantial, to communicate with the Creeks.

4th. From the low flat country the canal passes through, and its wet spongy nature, being mostly a juniper swamp, a sufficiency of water is always in it for the shingle flats; but if there should be a scarcity in very dry times, the cross canal intended to be cut into Drummond's lake, from which the distance is only three and a quarter miles, will always afford an abundant supply. The way or track has been cleared to the pond from the canal thirty feet wide. (See A, on the plan.)

5th. There is no river or water course that the canal passes through, except the head of the Northwest river run, and that is only a small drain flowing from towards the lake.

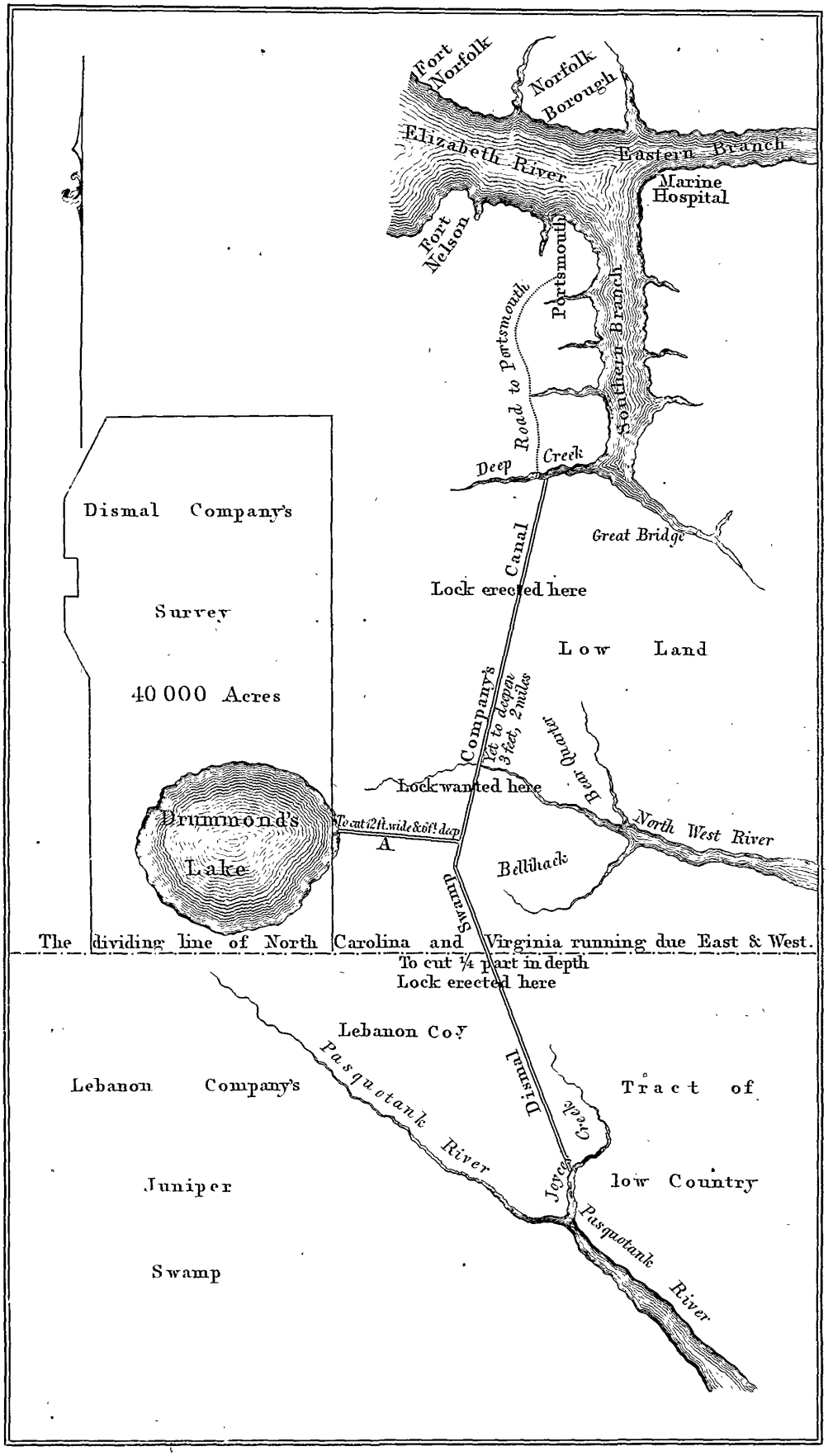
6th. The laws of Virginia and of North Carolina first enacted for cutting the canal, passed in December, 1787, they required the canal to be cut thirty-two feet wide, eight feet deep, and the locks to be ninety feet long, and thirty-two feet wide; a subsequent law passed in November, 1790, authorizing the directors to cut the canal only sufficiently wide for vessels fifteen feet wide, and drawing three feet water, in consequence of which, the president and directors, then acting, altered the canal to twenty-four feet wide, and six feet deep, which is the dimension it has been cut since this act was passed; the road is made on the west side eighteen feet wide the whole extent of the canal, it is well wooded, and the mud and clay thrown out of the canal on it when dried makes a good road. The vessels at present used on the canal are flats from thirty to forty feet long, and from four to six feet wide, drawing not more than from eighteen to twenty-four inches water when loaded, and will carry from four to eight thousand long shingles.

7th. No objections of those kinds.

8th. None.

9th. No defect in the plan; nothing now required but money to complete the work on the present system.

10th. The articles at present brought down the canal are chiefly juniper shingles, three feet long and six inches wide, some two feet long, and others from eighteen to twenty-two inches long, the short shingles sell from four to five dollars, and the long from ten to twelve dollars per thousand; the estimate for the last few years has been about one million of short, and two millions of three feet, the latter are mostly shipped to the northward. Before the canal was cut the expense of getting the shingles out of the swamp was great, and only to be done by making roads


Fort Norfolk
Norfolk Borough
Elizabeth River
Eastern Branch
Marine Hospital
Fort Nelson
Portsmouth
Road to Portsmouth
Southern Branch
Deep Creek
Great Bridge
Dismal Company's
Survey
40 000 Acres
Canal
Lock erected here
Low Land
Company's
Lock wanted here
Bear Quarter
North West River
Drummond's Lake
To cut 12ft. wide & 6ft. deep
A
Bellihack
Swamp
The dividing line of North Carolina and Virginia running due East & West.
To cut ¼ part in depth
Lock erected here
Lebanon Coy
Lebanon Company's
Juniper
Swamp
Pasquotank River
Dismal
Creek
Tract of
low Country
Joyce
Pasquotank River

laid with wood, and those generally five or six miles in length. A shingle flat will pass the canal as fast as a man or horse can walk on the bank towing it along.

11th. The capital first authorized by law for cutting the canal, was $80,000, divided into shares of $250 each, of which the State of Virginia subscribed for 50; a subsequent act passed in 1799, authorizing a further subscription of $20,000 more, of which the State took 20 shares, making, in the whole, 400 shares, of which the State holds 70, and private individuals the remainder. This capital of $100,000 has been expended in carrying on the works since its commencement, and the only funds now for carrying on the work is what tolls are collected, and the loan of a few thousand dollars from the subscribers in the neighborhood, which, at present, do not admit of the employment of from twenty to thirty hands in the summer months, or half that number in winter.

12th. The contracts made for cutting part of the canal soon after the law passed was at the rate of $4,000 per mile; about half the distance may have been cut this way, the remainder has been done by hiring negroes by the month and year, and employing an overseer to superintend them, and the works, for the last three or four years this method has been adopted, found to be the cheapest, and work done much better.

13th. The rates of tolls now collected are as follow: for 18 and 22 inch shingles, 25 cents; 2 feet, 33 cents; 3 feet, 50 cents per thousand; barrel staves, 50 cents; hogshead staves, 75 cents; pipe staves, $1 per thousand; timber or logs, 6 cents each; wood, 25 cents per cord; boards or pales, 50 cents per thousand; inch plank, 50 cents; two inch plank, 75 cents per thousand; carts passing the road, 25 cents; wagons, 50 cents; four wheel carriages, 50 cents; two wheel carriages, 25 cents; man and horse, 12½ cents; every head of cattle, 6 cents; hogs and sheep, 2 cents each. It has not been deemed necessary to fix the rates of tolls on other articles until the canal is completed, and the locks erected to open a free communication betwixt Virginia and North Carolina. The company has six negroes belonging to it; these, with an overseer, may be considered sufficient to keep the works in order after they are completed. With a clerk or toll gatherer at each end of the canal, the whole expense may be about $1,500 per year; a saw and grist mill is erected by the company at Deep creek across the canal, which has produced a profit of from $600 to $800 per year; it must be removed when a lock is built there, to communicate with the tide water.

14th. The act of the Legislature of Virginia for cutting the canal passed 1st December, 1787, and the Legislature of North Carolina, the 13th of December, 1790, for them to be completed in ten years; subsequent acts have been passed, the Legislature extending the time to the 1st of August, 1812.

It may now be necessary to observe, that the canal has been cut its full width and depth from Deep creek to Joyce's creek, except two miles on the north side of the Northwest river run, (marked on the plan with red ink,) which distance requires to be deepened three feet; and the distance of three-quarters of a mile in North Carolina, (also marked with red ink,) is to be cut one-fourth part, the other three-fourths of that distance being done; these, with the cut into Drummond's lake, intended to be twelve feet wide, and six feet deep, is all the cutting to do, and the three locks before described is all that remains to complete the canal, which may all be done next summer and fall, with about fifty hands, should it be a tolerably dry season.

It may be also proper to notice, that if it be found necessary hereafter to widen and deepen the canal so as to admit vessels of fifty or sixty tons to pass through, it may be done with much less expense, in proportion to the present cutting, the bottom being clear of stumps and rocks, and a fine tough pipe clay, and the sides firm and not the least subject to cave in. This canal opens an inland communication from the head of the Chesapeake bay to Beaufort, in North Carolina, and all the adjacent rivers in that State.

In addition to the foregoing it may be necessary to observe, that a sum not less than $25,000 will be wanted to complete what remains to be done, and to repay what has been loaned by the stockholders.

RICHARD BLOM, *President Dismal Swamp Canal Company.*

A. No. 4. (2.)

CANAL BETWEEN THE WATERS OF VIRGINIA AND NORTH CAROLINA.

The important advantages that would accrue from an inland navigable communication being formed between the waters of Virginia and those of North Carolina, had attracted the notice of many persons previously to the termination of the American revolutionary war. Various opinions had arisen respecting the most proper place to form such a communication; but owing to the want of an accurate knowledge of the geography of the country, and of the elevation of the ground between the most approximate points of those waters, no correct judgment had been formed upon the subject until very lately.

In 1787, an act was passed in the Virginia and North Carolina Legislatures, authorizing the incorporation of a company, under the title of the Dismal "Swamp Canal Company," whose object was, to open a navigable canal between a branch of Elizabeth river in Virginia, and Pasquotank river in North Carolina. This undertaking was soon after commenced, and is now nearly completed; but although this canal possesses many local advantages, yet, as the width of Albemarle sound is too great to admit the passage of calleaux, or such vessels as are proper for river or canal navigation, it is rendered of no utility to the inhabitants of that extensive and fertile country through which Roanoke, Meherin, Nottoway and Blackwater rivers, and their various branches, flow. A canal placed in a situation exempt from that objection, therefore, became an object of attention; and in 1791 an act of the Virginia Legislature was obtained for cutting one from a branch of Nansemond river to Somerton creek. Upon examining the intermediate ground, however, it was found to be so elevated, so broken, and so destitute of resources of water, that the opening of a navigation that way was judged to be impracticable.

While examining the ground between Nansemond river and Somerton creek, it was discovered that the country a few miles to the eastward, was lower, leveller, and better supplied with water. A survey was made from Bennet's creek (a branch of Chowan river) to Nansemond river at Suffolk; and from the bank of the one to that of the other, a precise level was found, except in one or two places of very small extent. The track marked out by that survey is unquestionably the most proper place for the desired communication. It appeared so to the persons by whom the survey was directed; and, on application to the Virginia and North Carolina Legislatures, laws were passed in 1804-5, authorising a canal to be cut there.

It had previously been proposed to cut a canal from Roanoke river above the falls, to Meherin river at Murfreesborough; and a law authorizing that undertaking was passed in the North Carolina assembly at the same time the law was passed respecting the canal proposed to be cut from Bennet's creek to Nansemond river. At the falls of Roanoke, the waters, in the course of fifteen miles, has a descent of ninety-three perpendicular feet. The distance from the upper part of the falls to Murfreesborough, is about thirty-eight miles. The intermediate ground has been examined by some persons of discernment and information, from whose statement it appears, that a canal might be cut along the highest dividing ridge of ground between the two rivers, on a precise level, in almost a direct line from the falls of Roanoke to Murfreesborough, and at an elevation lower than the level of Roanoke

above the falls, whence an abundant supply of water might, at all times, be obtained. But as this ground has never been examined by any engineer, nor the plan of the proposed undertaking thoroughly digested, it is impossible, at this time, to make a correct report, either upon its practicability, or probable expense.

The funds necessary for carrying on those projected undertakings, not having been raised within the time prescribed by law, they were both consequently abandoned; but although they did not receive that spirited patronage which was requisite to their success, yet, whoever takes a circumspective view of the country which lies between the ocean and the extremity of those rivers that run from the westward and northward into Albemarle sound, must feel an irresistible conviction, that the execution of the proposed canals would be productive of incalculable benefits to a very extensive and prolific district of country, and is an object highly deserving the attention of Government. By opening a direct, safe, cheap, and expeditious communication with the nearest and best seaport, it would give to the inhabitants of the upper country all the advantages of commerce, from which the expensiveness of a distant land carriage now almost entirely excludes them. By facilitating the conveyance of the productions of the country to market, it would encourage agriculture, and greatly enhance the value of real property; and by furnishing a ready passage to vast quantities of the most valuable articles of exportation, and their returns from foreign markets, it would produce a considerable augmentation of the public revenues.

But if, after proper investigation, it should be deemed impracticable or inexpedient to cut a canal from the falls of Roanoke to Meherin, still would the conveyance of heavy articles from and to the upper country be greatly facilitated, were a canal to be opened between Bennet's creek and Nansemond river. Tobacco, grain, &c. might be brought by water to the falls of Roanoke, thence by land carriage to Murfreesborough, or by a shorter portage to Fountain's creek, and thence by water through the contemplated canal to Suffolk or Norfolk, and salt, iron, &c., returned the same way, at half, or perhaps, a third part of the expense of land carriage to or from Petersburg or Fayetteville.

The following description of the proposed navigation from Meherin to Nansemond river, is drawn chiefly from notes furnished by John Barnett, by whom that tract was surveyed in 1803. (See the annexed draught.)

Chowan river runs southeast by east, from the mouth of Meherin to the mouth of Bennet's creek. The distance is sixteen miles. Within this space the river is from four hundred to six hundred yards wide; it is nearly straight, is free from rocks or shallows, and has no current except after extraordinary falls of rain. At the mouth of Bennet's creek it suddenly expands to nearly three miles in width, and grows gradually wider until its entrance into Albemarle sound, which it forms by its junction with Roanoke. Immediately below Bennet's creek, lies Holloday's island, which effectually defends the mouth of the creek from the swells which high winds sometimes occasion in the broad part of the river below. Bennet's creek is navigable as far as the bridge at Gate's court house, for any vessel that can pass Ocracoke bar. The course is north northwest, and the distance 17 miles; but it may be shortened nearly one-half by cutting across some low and narrow necks of land, at which different windings of the creek approach very near to each other. From the bridge to Hinton's landing, the course is east northeast and the distance about ten miles. To this place the creek is navigable for batteaux, and has little or no current except in wet seasons. From Hinton's landing to that part of the creek which is nearest to Powel's mill, on Curripeake swamp, the course is north northeast, and the distance two and a half miles; and thence to Powel's mill, in a direct line across the high land, the course is northeast, and the distance three and a half miles. In this space, the highest elevation of the ground is twenty-eight feet above the common high water mark in Chowan and Nansemond rivers. It is nearly a dead level, being in no place more than three feet above the surface of the water in Powel's mill-pond. The foundation is clay, covered with a thin stratum of sand. Powel's is an undershot mill, and has a fall of water of only three feet; it was intended to have carried the canal below this mill along Curripeake swamp eastwardly, two miles, to the edge of the great Dismal swamp; thence, along the edge of the Dismal swamp, due north, thirteen and a half miles, on a dead level, to within two miles of Suffolk; whence, by making a small curve in the course of the canal, the level might still be preserved to the bank of Nansemond river at Suffolk, where nature has admirably formed the ground for the construction of a basin. The whole length of this intended navigation, from the bank of Nansemond river to the navigable water in Bennet's creek, is twenty-three and a half miles.

It was intended to have erected two or three mills on Bennet's creek, with a lock for the passage of boats at each; the lowest one to have been at the head of the present navigation, and the pond of the highest to have been connected with that of Powel's mill, by means of a canal six feet deep, and eighteen feet wide. At Powel's mill, a lock of three feet descent was to have let vessels into the lower part of the canal, whence the navigation would have been unobstructed to Suffolk.

Bennet's creek is one of the best mill streams in that part of the country, and the value of mills erected at the places proposed, would exceed the expense of erecting both them and the necessary locks. Curripeake swamp is a copious and never failing stream, and is the source on which the canal would principally depend for water in dry seasons. Several canals having been cut in different parts of the Dismal swamp, the ground there is proved to be peculiarly propitious to purposes of that kind, being, particularly in the part through which the canal in question would run, an indurated mud intermixed with gravel, and free from stones or quicksands, or any other obstacle which might render the accomplishment of the work either difficult or precarious.

The following estimate of the expense of opening the proposed navigation between Bennet's creek and Nansemond river having been made by a person experimentally acquainted with works of that kind, it may be depended upon for accuracy, so far as accuracy at this time is attainable.

Clearing Bennet's creek below the last lock,	$500
Building two mills and locks	5,000
Purchase of the sites of the mills, &c.	300
Clearing the creek from one mill to the other,	300
Cutting a canal 6 feet deep and 18 feet wide from Bennet's creek, to Curripeake swamp, 6,160 yards, at $1 50 per yard,	9,240
Building a lock at Powel's mill,	200
Cutting a canal from Powel's mill to Suffolk, 4 feet deep, and 18 feet wide, 30,800 yards at $1 50,	46,200
Purchase of the ground through which the canal would run, 21 miles, 100 feet wide, say 180 acres at $1 00 per acre,	180
Constructing a basin at Suffolk,	1,000
Building three bridges across canal, at $100,	300
Contingent expenses, in which are included engineer's fees, wages to superintendents, &c.	5,000
	$68,220
Deduct for the probable value of the mills when completed,	3,000
	$65,220

Respecting the rate of tolls intended to have been charged for the passage of articles through this canal, reference may be had to the act of the Virginia or North Carolina Legislatures, passed in the session of 1804-5; but respecting the gross amount of tolls, the annual nett income, or the amount in weight or value of the articles which would annually be conveyed by this canal, nothing can now be said with any probability of accuracy. It is not improbable, however, that most of the foreign trade of a third or fourth part of North Carolina, and five or six counties of Virginia, would pass through it in a little time after it were put into operation; and, in the event of a war between this country and England, it would probably afford a passage to a large proportion of all the foreign trade of Virginia, as well as become the principal medium of communication between the Northern and Southern States. The importance of such a communication in the event of our seaports being blockaded by a foreign enemy, is too obvious to need any illustration. When it is considered what immense quantities of lumber, naval stores, pork, tobacco, grain, &c. that portion of country through which Roanoke and Chowan rivers and their branches flow are capable of producing, for which the cheapest, safest, and, in every respect, the best course to market would be through this channel, a doubt cannot be admitted, that the profits of the contemplated navigation would greatly exceed its expense, besides yielding a high interest upon the capital expended in its establishment. Add to this, the vast accession of wealth which the inhabitants of that portion of country would derive from the consequent enhancement of the value of their lands, and the facility of conveying the productions of the country to market, as well as to the merchants of Norfolk, which place is formed by nature as the only proper depot of that trade with foreign nations, and it may appear astonishing that an enterprise of so much private as well as public utility should have received so little encouragement or attention. The cause, however, may be ascribed to that diversity of opinion so apt to be entertained upon subjects not well understood; to that indifference with which each individual usually beholds an object in which every one is equally interested, or, perhaps, to the peculiar circumstances of the inhabitants of the circumjacent country; to their ignorance of the nature and effects of such enterprises; to their possessing but little spare money, and their aversion to risk that little in speculations, the success of which, they consider as doubtful, or the profits distant; or to obstacles thrown in the way by persons residing in places whence the canal in question might divert the current of trade. But be this cause what it may, it is now certain that the work will not be accomplished by any such association of private individuals as was originally had in view. It is hoped, therefore, that an object of such general and important utility will engage the attention of an enlightened and patriotic administration, who will direct such measures in relation thereto as in their wisdom may be deemed proper.

Extract of a letter from Thomas Eddy to Samuel Osgood, Esq. dated

NEW YORK, *October* 29, 1807.

Of the Northern Company for connecting the waters of Hudson river with Lake Champlain.

The company, about ten years since, expended all their funds in prosecuting the works at Stillwater and Skeensborough; at the former place the whole is lost, and not much advantage would be gained by what has been done at Skeensborough, in case the prosecution of the works there should be recommenced.

The most expensive part of the whole line of communication from the Hudson to Lake Champlain is at Stillwater. The length of the canal, necessary at this place by Swartz's mill-dam, is twelve miles one furlong and seven chains, and the ascending and descending lockage one hundred and six feet; the length of the canal on the eastern route is eleven miles seven furlongs and six chains, and the lockage seventy-four feet. A regular survey, beginning at Swartz's mill, was made by William Weston, the company's engineer, and the expense for completing the canal and locks was estimated by him at $275,865 74; but it is believed this was overrated.

The improvements of the navigation at the falls near Fort Edward, by means of a canal and lock, would not be difficult, or attended with great expense; and the Hudson above Fort Edward may be connected by a canal and locks with *Northern* Wood creek, which disembogues into Sloop navigation on Lake Champlain at Skeensborough. No accurate survey has been made, but the expense, it is believed, would not exceed $200,000; and the whole being completed, would form an excellent, and, indeed, a most perfect internal navigation from Albany to Lake Champlain, which would produce a certain compensation to the company, and incalculable advantages to the State and the General Government.

I will always, with much pleasure, communicate any further information in my power; and am, with great respect and esteem.

B. No. 1.

EXAMINATION OF THE HUDSON RIVER.

The committee appointed by the directors of the Northern Inland Lock Navigation Company, in the State of New York, to examine Hudson river, the country between that river and Wood creek, and that creek to where it discharges its waters into Lake Champlain, and to suggest the improvements requisite to accomplish the important object for which the company was incorporated, beg leave to report:

That, on the 21st September, they proceeded to the execution of the duties enjoined them; the result of their observations and surveys is contained in the following detail:

By the act of incorporation, the navigation of Hudson river, from the mouth of the creek, on which the grist mill occupied by Colonel Rensselaer is erected in the town of Troy, to opposite the house of Mr. Tibbets in Lansingburg, is to be rendered navigable for boats drawing four feet water when loaded.

Your committee, therefore, examined the rapid just above the said creek, and that which is half a mile higher up the river, and at the upper end of Whale island, and found, that, although the work contemplated, on the view in August last, would be adequate to the immediate object of affording four feet water, between the points above mentioned, yet they would but very little, if at all, facilitate the navigation to Waterford, and found that such a beneficial alteration of the intended works might be made as to embrace both objects; that is, efficiently to improve the navigation to Waterford as well as to Lansingburg; your committee will hereafter particularize the contemplated improvement in this place.

They then proceeded to the rapid, next beyond the creek above mentioned, which extends about thirty yards; the perpendicular height of the whole fall about two feet, and in the present very great drought, boats drawing one and a half feet water only can be carried over the rapid. Bottom rocky.

On, about half a mile in gentle current; two feet water, to the foot of the rapid at Whale island; this extends about two hundred and fifty yards; the whole fall about three and a half feet; depth of water about one and a half feet, bottom rocky; breadth of the river about four hundred and seventy yards.

On, in gentle current and deep water, about one and a quarter miles to the rapid below, and at Waterford, of these there is succession for half a mile, with small intervals, of deep water; the water on the rapids about one foot; the descent about four feet; through winding channels, with turns too short for large rafts, or even boats of a length to carry four hundred bushels of wheat, except in freshets; the bottom all rock; breadth of the river at Waterford about three hundred and twenty yards.

On, from the head of the rapids last mentioned; two miles to Schonhoven's rapid, water deep, current gentle; this rapid extends near half a mile apparently, about nine feet fall; the water on the rapid shallow, not exceeding one foot in general; the bottom all rock; breadth of the river about three hundred and sixty yards.

On, in deep water about one and a half miles to the Owl rapid; this extends a quarter of a mile, has one sharp pitch, on which great velocity of water then descends, with a diminished fall; the water sufficiently deep on the pitch, but on every other part so shallow, as to be only passable with an empty boat; the bottom all rock; breadth of the river about three hundred and fifty yards.

On, in good water, gentle current, about one and a quarter miles to the foot of the rapids at Fort's; these extend three quarters of a mile, very rapid and totally impassable, except with an empty batteau; whole height of the fall about nine feet; the bottom rock; the bank on the east side high, on the west low, the land a loose soil, and is fifteen chains across to the rising grounds, breadth of the river about four hundred and thirty yards.

On, one and a half miles in deep water, gentle current, to the rapids at Fonda's; here is a continued rapid, and falls for two and a half miles to the deep water above the falls, where Messrs. Palmer and Vandenbergh's mills are erected; nothing but empty batteaus can pass, and these not without being drawn over the rapids by hand; the bottom all rock; the river in general about half a mile wide.

On, from the falls at Stillwater, to the mouth of Batten Kill, about twelve miles in perfect good water, current imperceptible; here a small rapid, over which upwards of two feet water may be carried; bottom rocky.

On, one mile to the Little Falls; impassable for loaded boats; bottom all rock; rapids above the falls extending one quarter of a mile, the waters on them shallow; the breadth of the river at the falls about three hundred yards.

On, two and a half miles through deep water, gentle current, to the foot of the Fort Miller Falls; from the deep water below, to the deep water above the falls, the distance on a straight line, is about forty-two chains; height of the whole falls seventeen and a half feet; impassable for boats of any kind, except empty boats descending the river in freshets; breadth of the river at the falls three hundred and fifty yards.

On, one and a half miles in perfectly good water, to the Crooked rapid; here the velocity of the current strong, but great plenty of water; the rapid extends about three hundred yards.

On, in perfectly good water one and a half miles, to a small rapid extending about ten yards; bottom rocky; depth of water nearly four feet.

On, in perfectly good water, five miles, to just above the ferry, below Fort Edward.

From Fort Edward, left the river to explore the creek which falls into Hudson river at Fort Edward; this creek has very little fall in it, and sufficiency of water to supply a canal from the south end of the Great Swamp, which is about four miles from Hudson river. In all the extent between the river and swamp, the ground good for a canal; the fall in this creek has not been ascertained by actual admeasurement, but your committee, from a variety of information, as well as their own inspection, do not suppose the whole fall to exceed eighteen or twenty feet.

The Great Swamp extends about four miles to Wood creek, is apparently a perfect level, part of it well covered with timber, and part entirely without; even in this dry season the ground is so soft, that unless the foot is placed on tufts of grass which grow in the swamp, a man sinks half leg deep in mud and water.

On, four miles, along Wood creek to its junction with Half-way brook.

From the junction above mentioned, your committee descended in a batteau without any obstructions, other than those arising from great quantities of timber fallen or drifted into the creek. A sufficiency of water in every part; the current gentle; at about two miles short of the Falls of Skeensborough, a large pile of timber in the creek prevented the passage of the boat; we had then gone about sixteen or seventeen miles, sent the boat back, which returned to the junction above mentioned, about an hour after sunset.

The committee walked to the falls from where they left the boat; were informed that there was great plenty of water in the intermediate distance; the whole height of the falls about fifteen feet to the deep water in Lake Champlain.

Having thus stated the whole route from the mouth of the creek below Lansingburg to the waters of Lake Champlain, it remains to state the improvements which ought, in the opinion of your committee, to be made.

1st. A dam across Hudson river at the upper end of Whale island, of such height as to back four feet of water both on the rapids in the northernmost branch of the Mohawk river, where is now the usual fording place, and on the rapids at and immediately above Waterford, in Hudson river, it is conceived that a dam of eight feet perpendicular height would be amply sufficient; at this dam, a lock, to enter a canal formed by a dike or embankment, to run parallel to the east bank of Hudson river, and of about six feet perpendicular height; the dike or embankment to be made of timber, filled in with loose stones, and to extend from the dam to the mouth of Mill creek, where a lock must also be placed.

From Waterford to Stillwater, there are two modes of improving the navigation; the one by dams, locks, canals, and dikes or embankments in the river, to wit: one dam at the head of the rapid above Waterford, with guard-gates and a canal, embanked like that already described, of about three hundred yards, and a lock at its lower end; two dams, with similar canals, embankments, guard-gates, and locks, at Schonhoven's rapids, each of the embankments to extend about half a mile; one dam, guard-gates, lock, and embankment, at the Owl rapid, the embankment to extend about a quarter of a mile; one dam, guard-gates, lock, and embankment, at Fort's rapid, the embankment to extend nearly one mile; an embankment from the foot of the rapids at Fonda's, parallel to the west bank of the river, and to extend nearly to the foot of the falls near Palmer's mills, distance two and a half miles; four locks will be requisite here; from hence a canal through the land back of Palmer's house, and to enter Hudson river at the ferry above the falls, distance about forty-seven chains.

Your committee have traced the canal last mentioned and the embankments to the deep water below Fonda's, measured the distance from thence to the head of the rapids at Fort's, taken the levels, and traced a canal on the land from thence to Waterford; the field-book of which, together with a section of the levels, are annexed.

But to this mode of improvement your committee state the following objections:

The height of the dikes or embankments in the river to prevent the canal from being overwhelmed in high freshets will be attended with heavy expense; the injury which the guard-gates and lock-gates would be exposed

to from ice when the river breaks up, and from trees which may descend the river in freshets; the length and height of the dams to raise sufficient heads of water; and the perishable quality of the materials with which the dams and dikes or embankments must necessarily be constructed; stones and earth cannot be there obtained without great expense; and because several mills must necessarily be rendered useless, for which although the proprietors might be paid, would still be an inconvenience to the country, and perhaps injurious to the occupants, which ought never to be, unless where the necessity is indispensable to accomplish the object of the institution.

These objections induced your committee to make a critical survey of the country between the deep waters of the Hudson, above the falls at Palmer's mills, and the waters of the Mohawk, in its northern branch at Waterford, in order to discover the possibility of cutting a canal from the former to the latter point. In all this extent nature has so favorably interposed as only to require a moderate share of ingenuity and industry in man to surmount the obstacles which intervene. The plan of the survey will evince what is to be done to render this part of the internal navigation as complete as can be reasonably desired, and not subject to any of those disagreeable contingencies which may be expected from carrying the improvements within the banks of the river. A computation has been made, and is herewith presented, of the expense of these works. It will readily occur to the board that estimates of this kind can only be approximations of the real expense, as the human eye cannot be carried above the surface of the earth, and your committee had neither adequate means nor time to determine the nature of the strata below the surface as accurately as they wished; the means in their power they improved. From these, and a close examination of the surface of the ground through which the canal may be cut, they are tolerably sure that the expense will not vary widely from their estimate.

From what has been said in the detail of the general survey, it will appear that nothing is to be done from the falls at Stillwater to the falls above Batten Kill, other than cutting away an inconsiderable number of trees and brush standing on the banks of the river; that men or horses may with facility draw the craft employed in the transportation of the produce of the country.

At the falls above Batten creek, a dam to be erected across the river, about four feet high, to back the water, that vessels may ascend or descend the falls and the rapids just above this fall; and a lock, to let such vessels ascend and descend the falls and rapids; or a canal from the head of the rapids to the foot of the falls, whichever, on a more critical examination, shall be found most eligible.

The next obstruction is the fall at Fort Miller. A canal, of the length and in the direction designated in the plan, is to be cut here; a section is given of that canal, and an estimate of the expense thereof and of the requisite locks. This, and a dam of about four feet perpendicular height across the river, to deaden the current above, and to forego the necessity of cutting four feet deep through a hard rock in a considerable extent of the canal, will complete the works on Hudson river; for from this fall unto just above the ferry near Fort Edward the navigation is now competent.

The track of a canal from hence to the Great Swamp has not been traced by your committee; but the view taken certainly affords room to conclude that it will not be a difficult operation. To cut a canal directly through the Great Swamp would probably be more operose, as the laborers would have to work in very soft mud, and most probably, in all its extent, continually up to the waist in mud and water. It would, therefore, appear more advisable that the direction of the canal should be on the solid earth adjoining to the swamp, which would probably only increase the length of the canal about half a mile beyond that of a straight course through the swamp. Small cuts must, however, be made in the swamp to communicate with the canal, in order to obtain a supply of water; but, should the water thus collected be inadequate to support the canal and locks, when the produce of the country becomes more extensive than at present, it may be necessary to gain a head of water in those months when it falls in the greatest quantity, to be expended in those when least falls. This may be procured by a dam at each end of the Great Swamp, of about six feet high, which would cover about two thousand five hundred acres of waste ground, which cannot, without a very heavy expense, if at all, be reclaimed for the purpose of agriculture, because of the very little descent of the streams that issue out of the swamp.

The committee have made no estimate of the expense of the canal from Hudson river to Wood creek; it will probably not exceed 15 or £20,000.

From the Great Swamp, Wood creek, in all its extent to Skeensborough, only requires to be straightened in some places, and to have the timber taken out of its bed, except between the swamp and Fort Ann, where it may require to be deepened. A guess can only be made at the expense; we will suppose it to amount to £5,000; it will certainly, in the estimation of your committee, not exceed £6,000.

A canal and two locks at Skeensborough will complete the work. Here the distance to be cut does not exceed eighty-five yards; yet the rock through which it must pass appears hard, and at the same time not favorable for easy blowing. The expense will probably be about £3,000.

The computed expense for improving the navigation in all its extent from the mouth of the creek on which the mill occupied by Colonel Rensselaer is erected to Lake Champlain, stands as follows:

A dam from the east bank of Hudson river to Van Schaick's island, an embanked canal, twenty feet wide, from thence to the mouth of the mill creek, guard-gates and lock at the upper end of this canal, and a lock at its lower end, estimated at - - - - - -	£ 2,500
A canal from Waterford to the ferry at Stillwater, ten feet wide at the base, with eight locks, -	34,000
Clearing the banks of trees and brush from Stillwater to the falls above Saratoga, - -	300
A dam and canal at those falls, with guard-gates and locks, - - - -	800
A canal, twenty feet wide, with guard-gates and two locks, at Fort Miller, - - -	8,000
Cutting the trees and brush from the banks between Fort Miller and Fort Edward, - -	250
A canal, ten feet wide, from Hudson river to Wood creek, - - - -	17,500
Clearing and deepening Wood creek to Fort Ann, and clearing Wood creek of the timber and other obstructions in it, and cutting trees from the banks, canal and two locks at Skeensborough, -	9,000
Total, -	£72,350

The aggregate of the expense estimated for the completion of the whole improvements to be made by the company amounts, as above, to £72,350; but in works of this kind, where many men are employed, worthless characters will introduce themselves, notwithstanding every attention to prevent it; accidents will intervene, tending to retard the business; and contingencies, which the most sagacious cannot foresee, will be interposed, and all inducing to an accumulation of expense. We may, therefore, add the further sum of £7,650, to meet the contingencies already stated, and to defray expenses which may arise, and which cannot be anticipated; and thus the aggregate amount will be £80,000.

The annual interest of this estimated aggregate, computed at seven per cent only, is £5,600; and it is certain that the toll on the produce of the country, until the population shall be more extended, will, after deducting the

charges of collection, not amount to that sum; hence the stockholders will be sufferers. This cannot be either the wish or the interest of the community; to avoid this evil is then an object that must be attended to, and the remedy sought where only it can be found, that is, from the Legislature.

By the act of incorporation, the canals and locks are to carry boats of twenty feet wide, and boats drawing two feet of water are to pass in the driest seasons. But the expense of a canal to carry vessels of twenty feet wide is much more than double of one of ten feet, and the latter may be sufficient for every purpose until the increase of agriculture in the more northern parts of the State shall render more extensive improvements requisite.

If some of the canals, then, in the first instance, were made only ten or twelve feet wide, much expense will be saved, and consequently the produce of the country be charged with a less burthensome toll. Your committee, therefore, recommend that the Legislature should be entreated to leave it optional with the company to make their canals of the dimensions mentioned in the act, or of any other dimensions not less than ten feet at the base; the latter breadth would certainly suffice at present.

The company should also pray the Legislature so to alter the act, that if, in the greater part of the navigable season, the improvements shall be such as that two feet of water can be carried in the shallowest part of the improved navigation, the charter shall not be forfeited.

If in the driest season that quantity of water could not be had, and as the amount of the toll, which, in probability, will be received for several years to come, will not enable the company to divide a sum equal to what they might have made of their capital improved, at the market rate or interest, to compensate for this pecuniary sacrifice of the stockholders, the committee conceive that the company may, with propriety, solicit the Legislature the liberty of using any surplus water beyond what is requisite for the supply of the improved navigation, for the purpose of erecting mills and any other hydraulic works without carrying the profits which may result from such works into account as any part of the percentage which they are permitted to take, and that the land under the water of Hudson river, between the extreme points of the improvements, and between its banks, should be vested in the corporation as a free gift on the part of the people of the State, for the purpose of making the improvements contemplated by the act incorporating the company, or for the purpose of erecting mills, hydraulic, or any other works, for the use and benefit of the corporation, or to sell or let the privilege of erecting mills and such other works to any other person or persons whomsoever, and without carrying the profits of such mills and works, selling or letting, if any shall arise therefrom, in account as part of the per centage as aforesaid, under limitations and restrictions, that if any canal, lock, dam, dike, or embankment shall render useless the mill or mills of any other person or persons, or cover land of any other person or persons with water, that the corporation shall pay and satisfy the damages so caused, either by agreement with the proprietor or proprietors of such mills or such lands so covered with water, or by appraisement in manner directed by the said act.

It is problematical whether the company can oblige persons, through whose lands the improved navigation may run, to sell any more than what is immediately occupied by the canals and locks; but they will want more for houses for their officers, for bays or harbors to receive their boats and rafts, whilst others descending or ascending pass; for roads and other purposes which cannot be enumerated because not foreseen.

The Legislature should be solicited so to alter the act as that the company might take any quantity of land on each side of the canals and locks and other improvements not exceeding two hundred and fifty feet from the exterior of their canals, locks, dams, dikes, or embankments, ponds and water courses, making compensation in manner already mentioned for the damages.

It is not certain that the company can legally make any canal, lock, or other work relative to the object for which they were incorporated on any land, or any land covered with water, until they shall have actually not only located it, but until the appraisement is made. If they are thus restricted, the whole business may be arrested by captious persons, or such as would insist on extravagant compensation, and probably drive the company to comply with most unreasonable terms rather than sustain the damages that would result from delay in obtaining an appraisement in the manner directed by the law; for before such appraisement could be obtained, months might elapse. It should, therefore, be entreated of the Legislature so to alter the act, as that the company should have a right to lay out their works, and actually use the lands and waters they may choose to locate, and then, within a given time after such actual occupation, the appraisement should be made in manner now directed by the law, unless the parties can otherwise agree.

By the act of incorporation the directors are to be annually chosen on the first Monday in May; this is precisely the time when the improvements of the year ought to commence, and great inconveniences may arise from having a new board of directors appointed at that time. Your committee conceive that the Legislature ought to be entreated so to alter the act as that the election should be about the middle of January.

If, with the extent of improvements contemplated and recommended by your committee, the expense of conveying the produce of the interior country to market shall be found considerably less than at present, and the toll, nevertheless, such as to produce an annual income to the company equal to the market rate of interest, an increase of population will be evinced; and a progression to more complete improvements will immediately commence, without any additional burthen on the produce of the country, for it is perfectly evident, if the improvements are such as shall carry vessels of much greater burthen than without such extensive improvement, that the charge of freight must be proportionally diminished, and thus, although the toll must necessarily increase proportionate to the additional expense incurred, yet the aggregate burthen, arising from the toll and freight combined, must necessarily diminish. Unless the population of the interior country should be arrested, a diminution of expense arising from such an operation will clearly indicate such a reciprocity of interest between the company and the community as will impel the former to exertions to promote the weal of the latter, and induce the latter to cherish and extend its aid to the former on every occasion where it can be afforded without prejudice to individuals.

The penetration of the Legislature will readily discover the solidity of this position, and hence the company may reasonably hope for the favors and interference which your committee have recommended to be respectfully solicited of that honorable body.

From what has already been said, it seems hardly necessary to detail the order in which the improvements should be prosecuted, as this will result from keeping the reciprocity of interest above mentioned continually in view, as a leading object to secure success and respectability to the corporation, and clearly points out that the first exertions should be turned to that object which will be most immediately productive of revenue to the company, that is, through which the greatest quantum of produce will be transported; those are indubitably the improvements at Whale island, and the canal from Waterford to Stillwater, for reasons too notorious to require a detail, and those works, in the opinion of your committee, ought to be accomplished in the ensuing year; and indeed, if a sufficiency of laborers can be obtained, the whole of Hudson river, to the point where the canal from Wood creek will intersect that river, and the entire navigation to Lake Champlain completed the next year.

From the estimate, the amount of the digging is £24,688; if we suppose each man to work one hundred and sixty days in the season, it will take seven hundred and seventy men to earn that sum; to publish that such a number of workmen are required, would, for obvious reasons, be imprudent.

The State of Vermont will receive such extensive benefits from the improved navigation, that it is probable its Legislature would take measures to encourage their citizens to enter into the service of the company as laborers if an application was made to them, stating that it is apprehended that a sufficient number cannot be procured here. For, although in the opinion of your committee, the company ought not to solicit, or even accept of any pecuniary aid directly for the emolument of the company, if offered by that or any other State; yet the committee conceive that if the Legislature of Vermont, expressly to induce citizens thereof to enter into the service of the company, should offer such citizens pay in addition to that which the company may give, or to furnish them gratuitously with provisions, the company could not, with propriety, make an objection.

If such a communication to the State of Vermont should be deemed eligible, it would suffice for the present to advertise for three hundred laborers only, (if more offer, they may be engaged,) on the like terms and conditions as are offered by the Western Company. And as a sufficient number of carpenters can at any time be procured, that only two companies of ten each should be engaged on the terms above mentioned, but no positive engagements should be made until the result of the intended application to the Legislature shall be known.

That a master blacksmith with two assistants should be engaged also; and one good miner, who will be able to instruct and direct the common laborers in that business, whenever it shall be found necessary, and that miners by profession cannot then be obtained.

It would, perhaps, not be improper for your committee to suggest the arrangements for the most economical and efficient prosecution of this arduous undertaking committed to the directors, but as the board are advised of what has been recommended on this head, and approved of by the directors of the Western Company, a repetition seems unnecessary.

The committee will, therefore, close this report with a list of articles which ought to be provided before the ensuing spring, in addition to those for which measures have already been taken.

20 tons of hay; 500 bushels of peas; 500 bushels of corn, at or near Stillwater, to be provided at Albany, the whole to be ready by the 1st of April; 16 working oxen with yokes; 12 draught chains; 10 log chains; 4 strong iron bound ox carts; 300 fathoms tarred rope; 40 crow bars; 10 cart hooks; 300 falling axes, helved; 200 broad axes; 200 spades; 200 shovels; 200 pickaxes; 50 stubbing hoes; 10 cross cut saws; 5 whip saws; 100 bill hooks; 2000 pounds nine inch spikes; ½ ton of iron; 2 blacksmiths' bellows, with tools complete; 20 augers, assorted; 20 chisels assorted; 10 dozen gimlets, assorted; 10 hand saws; 10 large sledge hammers; 10 hand hammers; ½ dozen iron squares; 200 pounds steel; 4 casks 24*d.* nails, 200 pounds; 2 casks 20*d.* nails, 200 pounds; 1 cask shingle nails, 200 pounds; 10 grindstones; 4 reams writing paper; 150 camp kettles; 100 barrels pork; 200 barrels flour; (this can be obtained on the spot;) 50 bushels salt; 200 bushels Indian corn; 10 bushels peas.

All which is respectfully submitted.

PHILIP SCHUYLER,
ABRAHAM TEN BROECK,
JACOBUS VAN SCHENHOVEN,
STEPHEN V. RENSSELAER,
HENRY QUACKENBOSH.

ALBANY, *October* 30, 1792.

B. No. 2.

COMMUNICATIONS BETWEEN ATLANTIC RIVERS AND THE GREAT LAKES.

Extract of a letter from Thomas Eddy to Samuel Osgood, Esq. dated

NEW YORK, *October* 29, 1807.

The enclosed reports of the directors of the Western Inland Lock Navigation company, with the subsequent statement of the canals, &c., as far as they are now completed, will, I presume, be sufficient to afford all the information desired by the Secretary of the Treasury.

The locks at the Little Falls, erected in 1795, were of timber, and in 1802 they were entirely decayed, and in that and the following year the whole of them were completed with stone of a most excellent quality, and the workmanship executed in a remarkably handsome and substantial manner, superior, perhaps, to any in America, and said to be equal to any of the kind in Europe.

The locks at the German flats are of stone, and completed in the same manner as those at the Little Falls.

The locks erected at Rome, in 1797, were of brick, and in the course of a few years they were so injured by the frost that it became necessary to remove them, and in 1804 they were replaced with the same kind of stone, and finished in the same complete manner as those at Little Falls.

The navigation of Wood creek has been very much improved in 1803, by means of three substantial well finished wooden locks, but it is yet necessary to make further improvements.

The obstructions in Mohawk river have been considerably removed, but some impediments still remain.

The following improvements must be made in order to complete a good navigation, as contemplated by the act of incorporation:

The obstructions yet remaining in the Mohawk from Schenectady upwards should be removed.

Further improvements in Wood creek should be made.

And a canal and locks should be constructed at the Seneca Falls and Scawyaus.

The sum of $50,000 would complete the above improvements.

From Three River point down the Onondago river to Oswego, is a difficult navigation for boats, and another line of communication with Lake Ontario probably might be obtained when the country from Rotterdam to Salmon creek is more carefully explored, and a regular survey made.

The company have expended, since they were incorporated, in prosecuting the above improvements, about $400,000. A want of judgment in prosecuting works so novel in this country produced the immense loss sustained by erecting wooden locks at Little Falls, and a waste of large sums many ways.

The expense of stone locks at the Little Falls, in 1804, was about $7,500, each lock.

The capital stock of the company consists in—

2280 shares at $83 33⅓, - - - - - -	$190,000
350 shares at 120, - - - - - -	42,000
Total, - - -	$232,000

The amount expended beyond the capital was made up by the gift of the State, of $12,500 of the forfeited shares, and the receipts of tolls, as no dividends have been made, except for one year of three per cent.

The company is now in debt $20,000, so that there is no prospect of making a dividend till after the ensuing year. The stockholders have been deprived of receiving any interest on their advances since the company was established, except one year, and the directors consider themselves not justified in prosecuting further improvements for the present.

Amount of tolls at the German flats, and Little Falls, deducting the agent's commission for collection, has been—

In 1796,	$2,320 82	In 1800,	$5,600 04	In 1804,	9,445 05
1797,	2,871 76	1801,	9,490 34	1805,	10,178 05
1798,	$2,078 47	1802,	11,624 85	1806,	6,835 29
1799,	3,998 10	1803,	10,916 58	1807, to 1st October,	4,453 20

The following are the amounts of tolls at Rome, deducting the charges of collection—

In 1797,	$ 728 80	In 1801,	$1,571 72	In 1805,	$2,832 09
1798,	2,085 85	1802,	1,834 84	1806,	2,710 97
1799,	1,903 72	1803,	1,621 30	1807, to 1st October,	4,340 65
1800,	2,162 24	1804,	3,128 93		

P. S. I find I have omitted mentioning that the directors directed their engineers to survey the ground above and below the Cohoes at the mouth of the Mohawk. I have in my possession the draught of this survey with the estimates amounting to about $250,000, as may be found in his printed report of 1796.

To the Honorable the Legislature of the State of New York, in the Senate and Assembly convened: The Directors of the Western and Northern Inland Lock Navigation companies, respectfully report:

That in the summer and fall, ensuing the incorporation of the subscribers to the said companies, surveys were made on the western route, from Schenectady to Wood creek, and on the northern route, from the head of the tide water of Hudson river to Fort Edward; thence to the Northern Wood creek, and down the same, to its junction with Lake Champlain.

The object of these surveys was to ascertain what improvement the internal navigation on each route was susceptible of, and which, in particular, were the greatest obstructions to the water transportation of the agricultural produce of the interior of the State. The result was perfectly favorable, and followed by a determination on the part of the Western Company, to begin its operations at the falls of the Mohawk river, in Herkimer county, which created a portage, where all boats navigating the Mohawk river, with their cargoes, were transported nearly one mile over land, an operation attended with unavoidable delay, and great expense, as well as with injury to the boats and their cargoes. The work was accordingly commenced in April, 1793, with nearly three hundred laborers, besides a competent number of artificers, but its progress was arrested early in September for want of funds, many of the stockholders having neglected to pay the requisition made by the directors, either because they had not the means to supply such advances, or from an apprehension of the impracticability of succeeding in the operation. In January, 1794, the work was, however, recommenced, although feebly, and some progress made, in hopes that the Legislature would afford aid, by grants, or loans of money, or by taking the unsubscribed shares. Accordingly, the Legislature, sensible of the propriety of relieving the stockholders in one or either of these modes, and appreciating, with that discernment which has invariably characterized the Legislature of this State, the advantages the community at large would derive from the success of the important undertaking, which they had encouraged individuals to attempt, directed a subscription, on the part of the people of the State, of two hundred shares to each company; this measure was attended with the most salutary effects. The hopes and confidence of the companies were revived, and the works recommenced in May last, with a correspondent degree of alacrity; but the very high price of agricultural produce creating a most extensive demand for labor, it was found impossible to obtain such a number of workmen as were requisite to the finishing of the work before the end of the summer. Hence it was the 17th of November before the canal and locks were so far completed as to afford a passage to boats. An account is herewith delivered of the number of boats which passed to the 18th of December, when the frost rendered the navigation in the river no longer practicable; what remains still to be done at that place is trifling, and a full completion of all the work will be effected by a small number of hands employed for a few weeks in the ensuing spring.

As a description of the country through which the canal is carried, a detail of its formation, and delineation of the beneficial effects, which already are, and will hereafter be, experienced from it, may not be uninteresting to the community, and in particular to the Legislature, whose deliberations have the interest of its constituents so constantly in view, we beg leave to exhibit the following summary:

The canal is drawn through the Northern shore of the Mohawk river, about fifty miles beyond Schenectady. Its tract is nearly parallel to the direction of the waters of the fall, and at a mean about forty yards therefrom. Its supply of water is from the river, and the canal commences above the falls in a neat well covered basin of considerable depth of water, and re-enters the river in a spacious bay at the foot of the falls; its length is 4752 feet, in which distance the aggregate fall is forty-four feet seven inches. Five locks, having each nearly nine feet lift, are placed towards the lower end of the canal, and the pits, in which they are placed, have been excavated out of solid rock of the hardest kind; the chamber of each lock is an area of seventy-four feet by twelve in the cleave, and boats drawing three feet and a half of water may enter at all times; the depth of water in all the extent of the canal beyond the rocks is various, but not less than three feet in any place; near the upper end of the canal a guard lock is placed without lift, to prevent a redundancy of water; when the water in the river rises beyond the lowest state, sluices are constructed to discharge the surplus water entering the canal, from the two small rivulets which intersect its course; about 2550 feet of the canal is cut through solid rock, and where the level struck above the natural surface of the earth, or rather rock, strong and well-constructed walls are erected, supported by heavy embankments of earth, to confine the water and to keep the level, hence there is no other current in the canal than an almost imperceptible one, when the summit lock is drawn; three handsome and substantial bridges are thrown over the canal at so many roads which have been intersected by the canal.

The following state of facts will evince the beneficial influence this important work has had on the transportation of the produce of the country beyond the falls, and on that of the necessary supplies for the consumption of our useful hardy husbandmen in that quarter, employed in reducing a wilderness to smiling and fertile fields, promoting their own happiness, and the commerce and respectability of the State.

The falls, previous to the improvements above stated, being impassable, even for empty water crafts, these, with all their cargoes, were transported by land over a road as rough, rocky, and bad as the imagination can conceive; of necessity, therefore, the boats were of such construction as might be transported on a wheel carriage, consequently, of little burthen, seldom exceeding a ton and a half; each boat was navigated by three men, and a voyage from Fort Schuyler to Schenectady, a distance of one hundred and twelve miles, and back to the former place, was made at a mean in nine days. Thus the transportation of a ton of produce, if no back freight offered, was equivalent to one man's wages for eighteen days; the canal and locks can pass boats of thirty-two tons burthen and upwards, but impediments in the river, still to be removed, between Schenectady and the falls, and between the latter place and Fort Schuyler, prevent the use of boats of more burthen than ten or eleven tons, each of these are navigated by five men, and make the same voyage in fourteen days, which, if no back freight offers, is at the rate of seven days' wages of one man for one ton; but, until improvements shall be made in the river below and above the falls, these boats, when the water in the river is in its lowest state, which is usually from the middle of July to the close of September, can only convey about five or six tons in that period, then the transportation of a ton between the places aforesaid is equal to the wages of one man for fourteen days, affording still an important saving. The whole time taken to pass the canal and locks does not exceed three-quarters of an hour; the same burthen transported as heretofore by land, caused a detention at the very least of an entire day and often more; but the advantages above detailed will not be confined to the inhabitants residing in the country on both sides of the Mohawk, between the falls and Fort Schuyler, but extended to those in the more western part of the State; when a canal of little more than a mile and a half in length, through grounds unincumbered with rocks and chiefly cultivated, shall connect the waters of the Mohawk river with those of Wood creek, and when that creek shall be improved, and some trifling obstructions removed in some few places in the Onondaga and Seneca rivers, for then boats of ten tons burthen and more, may, with facility, be navigated to the most remote end of the Cayuga lake. The expense of these improvements, and those requisite between Schenectady and the falls, has been estimated by that able engineer, Mr. William Weston, who has conducted the company's works in the last year, and who has made a critical examination of the whole line which was the object of the act of incorporation. A report of his, with the estimates alluded to, and others to improve the navigation between Schenectady and the sloop navigation of Hudson river, are herewith delivered, the aggregate of which, although amounting to a sum probably beyond the ability of the company, until a more distant period in which by law the works are to be completed, is not only small, but perfectly trifling when put in competition with the incalculable advantages to every part of the community, which must inevitably result from the completion of the work in all the extent of the State.

The directors have already determined to form the canal, between the Mohawk river and Wood creek, at Fort Schuyler, and a proper person is sent to that place to receive proposals for furnishing the requisite materials, and proposals have actually been offered for doing the excavating part of the work by contract, on which the directors will decide with all convenient speed, that the operation may commence early next spring; and they hope its completion in the month of November next, unless accidents, not at present foreseen, should intervene to retard its progress.

It is seriously to be lamented that many of the stockholders are not in conditions to make advances in the present year, sufficiently extensive both for the canal at Fort Schuyler, and also to improve Wood creek, or the rapids between Schenectady and Schoharie creek. The directors will, however, think it incumbent on them to borrow money for those purposes, if it can be obtained by mortgaging the works already completed. The loan of a sum, equal to half of what the canal and locks at the falls have cost, would be amply sufficient for two of those objects, with such addition as it may be in the power of the stockholders to contribute. The account herewith delivered, (marked A,) will show what that cost amounts to, and another, (marked B,) what boats have passed; but as they cannot stipulate reimbursements sooner than at the expiration of five years, it is little probable that a loan can be made from individuals. Their only prospect of aid must therefore be a respectful reliance on the Legislature, which will undoubtedly appreciate the importance of speedily removing the obstructions alluded to, either by a loan, or by an anticipation of the payments on the shares in the stock held by the State. And as the estimate for the removal of all the impediments to the navigation between Schenectady and the carrying place at Fort Schuyler, the canal and locks at that place, the locks and other improvements in Wood creek, and the obstructions in the Onondaga and Seneca river as far as the southern extreme of the Cayuga lake, a distance of more than two hundred and sixty miles, adding ten per cent. on the aggregate for contingencies, amounts to £73,540, the proportion of this sum on the two hundred shares belonging to the State will be only £14,708.

The Legislature will permit us respectfully to observe, that, should assistance be afforded in either shape, the prospect of a speedy reduction of the price of transportation would, doubtless, greatly enhance the value of the property of the people of this State, bordering on the western waters, and recently purchased from the natives, and still unsold.

In the summer of 1793, the directors caused Wood creek to be cleared of the timber which had fallen into it, in such quantity as almost altogether obstructed the navigation; and, as the serpentine course of the creek greatly increased the distance, from its source to its mouth, beyond that of a straight line, thirteen isthmuses were cut, which made a reduction in the distance of more than seven miles. Its banks are, however, so thickly covered with trees of the largest size, and so many of those, either from decay, or by the force of the winds, are annually thrown into the creek, that it will be indispensably necessary to clear the banks of the timber, for the distance of four rods at least, and contracts are proposed to be made for that purpose. The lands on the south side of the creek, from opposite Canada creek to the Oneida lake, appertain to the State; and we humbly suggest the propriety of vesting the lands, to the extent of the distance above mentioned, in the Western Company. Should this favor be conferred on the company, and extended to enable them to obtain the same quantity of land on the northern shore, by an exchange with the present proprietors, for an equal quantity, (part of the small reservations on the Oneida lakes, purchased from the Oneidas,) it is believed the proprietors would be willing to make the exchange.

In the year 1793, the Northern Company commenced a canal in the vicinity of Stillwater, intending to extend it to Waterford. This business, after considerable progress had been made, was also arrested, and for the reasons which prevented the prosecution of the works at the falls. A contract was made in that year for constructing a canal and locks, to open the navigation of the northern Wood creek with Lake Champlain, obstructed by the falls at Skeensborough. The excavation of the canal, through solid rock, is nearly completed, and the locks will be constructed and finished in the present year, if contracts for furnishing the necessary number of bricks can be made, and which is now attempted to be done.

In 1794, the Northern Wood creek was partially cleared of the timber which had fallen into it, and boats are now capable of passing from the falls of the Skeensborough, to near Fort Ann; and, as the road between these two places is exceedingly bad and deep, very considerable advantage has resulted from the operation.

Mr. Weston has examined the direction of the canal commenced in 1793, near Stillwater, and the intermediate grounds to Waterford; the river, from Stillwater to Fort Edward; the country thence to Wood creek; and that

creek to its junction with Lake Champlain; and has given it as his opinion, that in all this line, as in the western, the country is more favorable for works such as are contemplated, than any he knows, or has ever been advised of; that the expense will be trifling, compared with any other of equal extent in any neighboring State which he has visited; but, for want of time, he was not able to take surveys, on which correctly to form estimates of each particular improvement.

Many of the settlers adjoining the waters on both routes, through which the improvements are intended, and by which the internal navigation, in its present imperfect state, is carried on, have very improvidently fallen the timber from the banks into those waters, to such an extent, as in many places renders it difficult to obtain a passage. This evil cannot be effectually remedied without further legislative provision in the premises; and the directors of both companies respectfully entreat the Legislature to afford it.

The valuation of the grounds, through which it has been, and shall hereafter be necessary to draw canals, in the manner directed by the act of incorporation, has caused serious embarrassment, as well to individuals, whose property is injured by the works, as to the company. An alteration in this respect is humbly entreated, and the directors beg leave respectfully to suggest the propriety of enabling the supreme and circuit courts to appoint appraisers, whose decisions shall be conclusive, under the sanction of an oath, impartially to estimate the damages, or such other mode as the wisdom of the Legislature shall devise.

The several accounts herewith exhibited will show the moneys which have been received by the directors, and how the same has been expended.

The arrestation of the work in 1793, the extravagant increases in the price of labor and materials, the want of experience in persons of every description, employed in works perfectly novel in this country, with the exception of the engineer in the last year, has greatly enhanced the expense, but which, we trust, will in future be avoided, as experience has enabled the directors to systematise their operations, and to introduce as much economy in the several requisite arrangements, as a business of this nature is susceptible of; and the directors have reason to believe, from the detailed manner in which the engineer has formed his estimates, that the future expense will be confined to the aggregate amount of those estimates. The directors will not, however, be deterred from prosecuting the works, committed to the companies respectively, with as much celerity as their funds will permit, persuaded that great and important advantages will result to the community, however small the retribution may be to the subscribers, at least for some years to come.

All which is most respectfully submitted, by order of the directors of both companies,

PH. SCHUYLER, *President.*

NOTE.—From the 17th of November, 1795, to the 18th of December following, eight large boats, and one hundred and two small boats, passed the Little Falls on the Mohawk, and paid a toll, in the aggregate, of £80 10, exclusive of that on nine boats which passed gratis, on the day when the locks were opened. The season being so far advanced, only a small portion of boats were navigated on the river in this month, compared with that usually employed in the navigating season.

Report of Mr. Weston to the Directors of the Western and Northern Inland Lock Navigation Companies.

GENTLEMEN:

Agreeable to your instructions of the 16th May, requesting me to examine such works as had been already executed, and such as remained to be done, by the two companies incorporated for the improvement of inland navigation in the State of New York, and to form such plans and estimates as might enable the directors to form an idea of the sums that would be requisite to carry the contemplated works into effect, I proceeded to an examination of the state of the works at the Little Falls, which, being a primary object with the directors, caused me to hasten them, without paying more than a transient attention to the intermediate navigation of that place and Schenectady.

A desire of availing myself of the extensive information and local knowledge possessed by General Schuyler, of the internal navigation of this State, induced me to accompany that gentleman, to the utmost extent of the limits prescribed by the Legislature, as the boundaries of the western inland lock navigation. Though this examination was performed first in point of time, yet I shall defer making any observations at present, deeming it more eligible to lay before the board a regular and connected account, from the eastern extremity, at Hudson river, to the western termination, at Lake Ontario.

The reason before mentioned, having prevented a particular examination of the Mohawk, on my ascending it from Schenectady to the Little Falls, and the necessity that was perceived on my return from the westward, of personally inspecting and hastening the completion of the works, at the last mentioned place, unavoidably postponed my re-examination to such an advanced period, as rendered it impracticable, from the height of water, to form an accurate judgment of the necessary improvements, and, consequently, of the attendant expense, previous to a description of the present state of the navigation of the Mohawk, and the means of connecting it with the waters which disembogue to the westward, in Lake Ontario. It will be proper to premise, that the estimates are formed with a reference to existing circumstances; an increase or diminution in the value of labor will, therefore, necessarily produce a proportionable variation in the amount. Keeping this in view, I trust the estimates will be found to approximate as near the truth as the uncertainty incident to works of this nature will admit. In such parts where the quantities can be ascertained by calculation, the allotted sums will be found as accurate as estimation will allow; but where, from particular circumstances, sufficient data cannot be obtained, much must depend on conjecture. Analogy, on experience in similar situations, can alone enable us to form any tolerable idea of the time and cost of execution; always taking into consideration the difference occasioned by dissimilarity of place and circumstance. In every instance I have wished rather to exceed, than to fall short, in the aggregate amount; in some places too much may have been appropriated, and in others, probably, not sufficient; but the excess of one, by counterbalancing the deficiency of the other, will produce a mean, differing but little from the specified total, provided skill and economy are united in the execution; it being always to be understood that I proceed on the supposition that the different works are all performed by contract. Having premised so much, I shall commence the survey at the Cohoes, proceeding westwardly.

The navigation of the Mohawk, near its junction with the North river, is interrupted by a large fall, known by the name of Cohoes, which descends perpendicularly upwards of seventy feet. This impediment has occasioned the navigation to terminate at Schenectady. The intercourse between that town and Albany, being carried on by wagons, the amount of the produce annually conveyed, the badness of the roads at particular seasons, and the great expense of land carriage, have long since rendered it an object of importance to connect these two places by a lock navigation. The most apparent route, and the easiest to be executed, is doubtless by following the Mo-

hawk in its course eastward to the Cohoes, and then by a canal from the level of the river above Lansing's mill, to form a communication with the Hudson. There are two routes, one of which, on the western shore of the Mohawk, commences at Lansing's mill, and terminates opposite to Troy; the other, on the eastern side, forms a junction with the Hudson at Waterford. To enable the board to decide on the most eligible line, I have surveyed both the plans and sections herewith exhibited; each, respectively, will explain the situation and elevation of the ground much better than can be conveyed by words; a comparative estimate is subjoined, showing the difference of expense that will attend on the execution. That the board may form a just conception of the merits of the two lines, it will be proper to observe, that the first mentioned one, though nearly two miles longer, delivers the boats into sloop navigation at Troy; whereas, the eastern canal, by entering the Hudson at Waterford, obliges the boats to descend that river to the same point, before their cargoes can be shipped on board the trading vessels, unless this difficulty should be obviated, by an improvement in the North river, so as to render it navigable for vessels of burthen to Waterford. From what has been said, the board will be competent to decide which line will best promote the interest of the stockholders individually, and the community at large.

The estimates, when the distance alone is taken into view, will appear very great; but when it is understood that the lockage is upwards of one hundred and forty feet, and that the quality of the ground, through which the canal must be unavoidably connected, is chiefly a slaty rock, removable, in a great degree, only by means of powder; when the price of that article, the high value of labor, and the little progress that can be made in such a material, are also considered, the amount will no longer appear surprising. Though the sum affixed as adequate to the removal of a cubic yard of rock is much less than has been recently given for the excavation of a road at the east end of the Cohoes bridge, yet I have reason to believe, that, by working to the best advantage, the cost will not exceed what I have allowed as competent to the performance. The consumption of powder will unavoidably be great; the exact quantity is not easily to be ascertained. I have calculated the expenditure in proportion to that consumed at the road before mentioned. The price has been fixed at a medium between the present and usual value. On account of the depth of cutting, I have contracted the width of the canal in various places, the slopes forming an angle of forty-five degrees with the horizon. The towing path is also diminished six feet; the benches are as one to two, or three feet horizontal, to six feet perpendicular. The above dimensions admit the passage of one boat only at a time; but as the distance will not in any instance be great, no inconvenience will result from the measure; especially as meeting places may be formed in the valleys on the western line, without additional expense, and the cost of making them on the eastern line will be an object of small importance. Some saving may be made in the execution, by dispensing with the towing path, and contracting the benches; but, as these are intended for permanent works, I do not recommend the adoption of this measure. It is usual in Europe to tunnel, or to form a subterraneous passage, where the depth of cutting exceeds twenty-five or thirty feet. Independent of the accidents these works are subject to, (and which are by no means uncommon,) the increased value of mechanical labor in this country would render this mode nearly, if not quite, as expensive as open cutting; which induced me to prefer the last mentioned method. The canal, in common cutting, is proposed to be twenty-six feet wide at the bottom, and thirty-five at the surface of the water, (which is three feet in depth,) the towing path elevated eighteen inches above it, and twelve feet in width. These dimensions are adapted to the size of the locks, as fixed by the Legislature, in the supplementary act of incorporation. The locks are proposed to be constructed in the best manner, with sound, hard-burnt bricks; the hollow quoins and coping of stone; the chamber capable of receiving a boat of seventy feet in length, and twelve feet in width.

At the time the above survey was performed, the water was so high in the Mohawk as to render a regular examination from the Cohoes to Schenectady useless; but, from a cursory view of the river for six miles above Lansing's mill, and from the information obtained from persons acquainted with the remaining part, it appears that the navigation in general is tolerably good, excepting in three or four places where short canals and locks would be necessary; the worst rapid is at Vanderbergh's, six miles from Lansing's mill. The most effectual mode of improvement will be to cut a short canal from the upper to the lower end of the fall, on the north-eastern shore; the ground is flat, and apparently free from rocks; the length will not exceed five hundred yards, and one lock will suffice for the ascent of boats. A small low dam, from each bank to an island in the middle of the river, would save some digging, and afford an extension and increase of water in the pond above. From hence to Schenectady, there are two more rapids, where it would be necessary to pursue the same plan. From the upper fall to Schenectady, a distance of four miles, the navigation is good; from this place to Schoharie creek (upwards of twenty miles) there are a continued series of falls, of greater or less extent; the number and situation of these are accurately detailed by General Schuyler, in his printed report of 1792, to which I refer the board for further particulars. Judgment and caution must be exerted in the improvement of these rapids, as, though inconvenient in themselves, they are beneficial in their consequences, rendering the intermediate navigation more perfect by preventing a too quick discharge of water in a dry season, thereby making a partial navigation, when otherwise there would be none. An opening sufficient to permit a boat to pass through with facility, and a small low dam, with an oblique wing wall, to collect a greater quantity of water in the channel and pond above, is the least expensive mode of execution. It is evident that this increase of depth, obtained by a contraction of the natural channel of the river, will occasion a proportionate increase of velocity, and a consequent obstruction to the ascending boats; to remedy this inconvenience it will be always prudent to have the opening near the shore, that the boats may avail themselves of the assistance of a towing path to facilitate their ascent—when there is a sufficient depth of water above and below the rapid, and the bed of the river is not a solid rock, the remedy is very easily effected. These instances occur very frequently between the Little Falls and Fort Schuyler, as will be more particularly mentioned hereafter. The state of the river to Schoharie creek is such as to induce me to advise only a partial and temporary improvement, as I am persuaded that, in a very few years, a natural and certain increase of trade will demand an attention which its consequences will doubtless obtain, and that then a canal on the southern bank of the river, to which purpose it is admirably adapted, from Schoharie to Schenectady, will be deemed absolutely necessary. The distance from Schoharie creek to the Little Falls is thirty-six miles, and, although there are several rapids, yet improvements will be neither difficult nor expensive. The particular manner of execution can only be pointed out on the spot, after a minute inspection of each respective rapid.

Passing through the canal at the Little Falls, the river continues navigable, near five miles, to Orendorff's rift; but previous to a further description it may be proper to point out what further steps are necessary to be pursued the ensuing year, to complete the works at the first-mentioned places. The great desire expressed by the board to have the canal opened this year made it necessary to finish partially the different works, in order to effect the desired purpose; the embankments were, therefore, left in an unfinished state. From the settling incident to them, and equality of the soil of which they are composed, and which was unavoidably used, it will be necessary, early in the ensuing spring, to employ one or two boats to raise such parts as shall require it, and to continue strengthening the banks, until it has obtained a proper form. I have given Mr. Usher instructions to attend to this part of the work, at the commencement of the thaw in the spring; and I have no doubt he will take every necessary precaution for its stability.

Recommencing the survey, we ascend, in good water, Orendorff's rift, a very strong rapid, the river being contracted into a narrow deep channel; half a mile above this is the Wolf rift, a wide and shallow rapid, continuing the same to Fort Herkimer. The best manner of improving this part will be to cut a canal from Fort Herkimer to the deep water below Orendorff's rift; the ground is very favorable, being free from rock, and with a regular and gentle descent; the length will be ninety-two chains, and the fall of the lock at the east end ten feet, supposing the fall of the upper gate level with the surface of the water above the Wolf rift. To obtain the requisite depth of water in the canal, I propose to throw a dam across the river to raise it three feet; this will save that depth of extra digging the whole length of the canal, and will also improve the navigation of the two small rapids above Aldridge's. The dam, guard, and river locks may be built with stone, to be obtained, on the south side of the Mohawk, at the Little Falls; the land carriage will not then exceed one mile, and it may then be conveyed in boats to the destined spot: the quality is well adapted for these or any other works, where strength and duration are required; the stones rising in lamina of different thickness; the beds perfectly parallel, and the dimensions as large as may be required. The expense attendant on this part will be found detailed in the estimate annexed hereto. The distance from Aldridge's to Fort Schuyler is nearly fifty miles; the navigation, with few exceptions, is exceeding good. The river, from Post's upwards, is much impeded with trees, which render the passage both difficult and dangerous; in some places accumulated to such a degree as almost to choke up the whole of the channel. The removal of these should be an object of the first attention; but the labor will be fruitless, if a supplementary clause to the act of incorporation is not obtained, affixing such penalties as may effectually deter the commission of acts, producing these consequences. As the few rapids in the last-mentioned district have generally deep waters above and below, and the bottom is either sand or gravel, they will be made navigable at a small expense. From the Mohawk, at Fort Schuyler, to Wood creek, there is a carrying place of one mile. In the spring, there is generally a sufficiency of water to enable the batteaux to descend with their cargoes on board; but, in summer season, it is necessary to convey the lading four miles further by land to Canada creek, and then there is some difficulty to float the empty boat down, though aided by a flush of water collected in the mill-dam during the preceding night. The ground between the two landing places is remarkably favorable for the canal, as the plan and profile, herewith exhibited, will clearly explain. The surface of the water in the Mohawk, at the upper landing, is sixteen inches higher than that of Wood creek, where Newport formerly stood; but the navigation from Colbraith's upwards is very bad, susceptible of improvement only by means of a dam. I have deemed it preferable to conduct the canal about one hundred yards below White's landing into good water. The length of the canal will be one mile, five furlongs, and two chains, and the lift of the lock eight feet, that being the difference of the elevation between the two points above mentioned. The soil through which the canal is carried, being chiefly sand, with a small proportion of gravel, and wholly free from rock, will make the expense of cutting comparatively small. The locks and abutments of the bridges are proposed to be built with brick; for the amount and particulars of expense, I refer to the subjoined estimate. It is to be observed that I suppose the waters of Wood creek, aided by those of a small rivulet, running at the foot of the rising ground on which Fort Schuyler stands, (and which may easily be conducted into the summit level,) will be adequate to the supply of a lock navigation. But should the increase of trade, at a future period, require further resources, they can be obtained by means of a dam thrown across the Mohawk, at the lower landing, so as to raise the waters therein level with those of the canal, which may be effected at an expense not exceeding one thousand pounds, and without causing any alteration in the rest of the works. Wood creek, from Fort Newport to its junction with Canada creek, is circuitous in its course, and the channel to Fort Bull, in general, very narrow; the fall to this last-mentioned place is fourteen feet and a half, and the length near four miles; the fall from thence to Canada creek is eighteen feet six inches, and the length three miles, one furlong, and six chains. The above fall I have divided into six locks, the ground not admitting of more than five or six feet lifts. This part of the creek, at present, is tolerably free from trees; but, unless the banks on each side are cleared twelve or fifteen yards in width, it will not long remain so: this is so necessary an operation that it should be immediately carried into execution from Fort Newport to the Oneida lake. From Canada creek to the royal block-house, (a computed distance of twenty miles,) the channel is much impeded by trees, which, lying across the direction of the stream, collect banks of sand, which choke up the passage, and, by directing the current obliquely against the banks, undermine them, and add fresh obstacles to those before accumulated. The course of the creek is naturally circuitous; the improvements made by Mr. Richardson have been very beneficial; but much yet remains to be done in the same way, which, when effected, will considerably shorten the distance. This operation, and the removal of the trees and banks of sand, by promoting a quicker discharge of water, will produce a decrease in the depths thereof, making it necessary to construct locks and dams, which will then render the navigation of Wood creek complete. The number and situation of these works cannot be ascertained, until a regular survey has been made, which cannot be done conveniently except in the winter season.

From the royal block-house to the outlet of the Oneida lake at Fort Brewerton is twenty-four miles, below which is Coquatanoy rift, about three hundred yards in length; the chief impediment is occasioned by an old Indian eel wear. A wing wall to confine the channel into a narrow compass, removing the loose stones in the bed of the river, and making a towing path on the adjacent shore, will suffice to render this plan navigable. From the outlet of the Oneida lake to the junction of the Seneca with the Onondaga river, at Three River point, (eighteen miles) the navigation is perfect, with a current scarcely perceptible. Proceeding up the Seneca river to the south end of the Cayuga lake, we have a navigation (with one or two exceptions, not worth mentioning) as complete as art or nature could render it.

Indeed, the Seneca, instead of being deemed a river, may, with great propriety, be considered as an extension of the Cayuga lake, the channel being wide and deep, with an imperceptible current; in short, from the east end of the Oneida to the south end of the Cayuga lake, a perfect navigation, extending upwards, of one hundred and twenty miles, in a direct course, may be obtained at an expense not exceeding two thousand pounds, as will be detailed in the annexed estimates. The Cayuga, at the north end, receives the Seneca river, distant from the lake of that name sixteen miles: ascending that river three miles, we come to the falls, where there is a carrying place three-quarters of a mile in length. Whenever the Western Company require this obstacle to be removed, a canal may be conducted on the north side from the upper to the lower landing; the length will be six furlongs, five chains, and the fall twenty-seven feet. Proceeding further up the river, we arrive at the Little Scawyau; the current is rapid, but sufficiently deep; the removal of an eel wear, and the formation of a towing-path, will make the ascent neither difficult nor tedious. From the Little to the Great Scawyau the river is deep, and the current moderate. At this place, a canal is practicable on either side; the length will be six furlongs, nine inches, and the fall fifteen feet, ten inches; from hence the river continues good to the outlet of the lake. It may be proper to observe, that, whenever these canals are carried into execution, great part of the sums expended in their completion may be reimbursed by the disposal of mill-seats, which are very scarce, (and consequently valuable,) in this part of the country.

Returning to Three River point, we proceeded down the Onondaga river to Oswego Falls, (twelve miles;) in this district are three rapids, two of which only are of consequence. At Oswego Falls is a short carrying-place,

but the boats are delivered into very rapid water, extremely difficult of ascent; a canal may be carried through rocky ground on the south side; the length will be sixty-two chains, and fall eighteen feet; from hence to Oswego, where the Onondaga river disembogues itself into Ontario, is a continued rapid for twelve miles. The adjacent shores being very steep and rocky, preclude every idea of conducting a canal along the bank; as the only remedy, recourse must be had to dams and locks. Averse as I am to this mode, yet necessity compels us, however reluctantly, to adopt it. The bed of the river being a solid rock is a circumstance that will undoubtedly contribute much to the stability of the works, and suitable timber, abounding on the adjacent shores, will diminish the cost of erection.

The number of these dams and the quantity of lockage cannot be ascertained, until a regular survey has been made; but, previous to this, or the expenditure of any money below Three River point, it will be advisable to examine attentively every other line of communication with Lake Ontario that has the least appearance of practicability. For this purpose I shall suggest to the board the propriety of exploring the intermediate country between Rotterdam and Salmon creek. From information obtained at Rotterdam, I understand that the distance from Oneida lake to the navigable waters of Salmon creek does not exceed sixteen miles; that the ground is favorable, being free from rock; and that the sources of Salmon creek, and the rivulet which enters the Oneida lake at Rotterdam rise near each other, and may, in all probability, be conducted into the summit level. If these conjectures should be verified by a regular survey, and if the springs that can be obtained are found adequate to the supply of a lock navigation, I shall certainly recommend this route as most preferable, not only on account of its stability, but also for being near thirty miles shorter than the Onondaga river. The expense of execution would probably be greater in the first instance, but I am persuaded would eventually be found cheaper from its permanency. Arrived at Lake Ontario, it is almost superfluous to remark (what is so obvious to every person the least acquainted with the geography of the State) on the immense expanse of internal navigation that opens upon our view; the extent of these lakes (with one obstruction only, that doubtless will be surmounted in a few years) presents to the mind a scene unequalled in any other part of the globe, offering to the enterprising and adventurous sources of trade rapidly advancing to an incalculable amount, ensuring a certain recompense to the individuals who promote, and the State that patronises their important undertakings.

WILLIAM WESTON.

ALBANY, *December 23*, 1795.

General view of the expense of improving the internal navigation from the tide water of Hudson river to the Cayuga lake, by means of canals, locks, and removing the obstructions in the rivers, so as to render them competent for the transportation of produce in boats of twenty tons and upwards, drawn from the estimates, made in detail by William Weston, Esq., engineer, after actual survey.

To connect the waters of the Mohawk river with the Hudson by a canal and locks from above the Cohoes Falls, an option of the two following routes is offered, to wit:

	£	s.	d.
From Lansing's mills, above the said falls, by a canal of four miles and fifty-four chains in length, on the *west* side of the Mohawk river to the sloop navigation opposite to the town of Troy six miles north of the city of Albany:			
Estimated expense, - - - - - - - -	102,268	4	6
Or from the said mills, by a route on the *east* side of the Mohawk river, to enter Hudson river, at Waterford, four miles above Troy, a distance of two miles and fifty-one chains:			
Estimated expense, - - - - - - - -	105,240	13	7
For the canals, locks, towing-paths, and other requisite improvements in the Mohawk river, from Lansing's mill to the town of Schenectady; distance about twelve miles:			
Estimated expense, - - - - - - - -	15,247	00	0
For like improvements from Schenectady to the mouth of Schoharie creek; distance twenty miles:			
Estimated expense, - - - - - - - -	15,000	00	0
For like improvements from Scoharie creek to the foot of the falls in the Mohawk river, in Herkimer county; distance thirty-six miles:			
Estimated expense, - - - - - - - -	4,924	00	0
The works at the falls are completed, and boats pass the canal and locks.			
For like improvements from the head of the said falls to the portage at Fort Schuyler, between the Mohawk river and Wood creek; distance fifty-six miles:			
Estimated expense, - - - - - - - -	8,914	15	6
For a canal, locks, and towing-path across the said portage; distance one mile and fifty-two chains:			
Estimated expense, - - - - - - - -	12,266	8	3
From the west end of the said canal, for like improvements, down Wood creek, to render it a complete canal navigation to its junction with the Oneida lake; distance thirty miles:			
Estimated expense, - - - - - - - -	28,787	00	0
From the east end of the Oneida lake to the outlet of the Cayuga lake little is to be done; the distance is one hundred and one miles, and the estimated expense is - -	2,090	00	0
From the said outlet to the western extreme of Cayuga lake is about forty miles: hence the total distance, if taken from Hudson river, at Troy, is three hundred and two miles, and the aggregate of the estimate for the whole is - - - -	189,497	8	3
Or, if taken from Waterford, the distance is two hundred and ninety-nine miles, and the aggregate of the estimate is - - - - -	192,769	17	4
The produce of the Western country, conveyed by water carriage, is landed at Schenectady; from whence to Albany there is a land carriage of seventeen miles: hence, if the canals and locks between Schenectady and the Hudson river are not constructed, the estimated expense for all the requisitite improvements from that town to the western extreme of the Cayuga lake will be only - - - - - -	72,982	3	9

And the distance about two hundred and eighty-five miles.

To every of the estimates ten per cent. has been added for contingencies.

SIR: ROME, *December* 29, 1207.

Your favor of the 15th instant, covering the resolution of the Senate of the United States, and your queries respecting canals, is received. I have enclosed herewith a map of the navigable waters between Hudson river and Lake Ontario, with the tributary streams that may be of most importance in any future improvement. Mohawk river and Wood creek were surveyed in 1803, and the levels taken from Oneida lake to Schenectady. The level was also taken from Schenectady to Hudson river; but I have never seen the returns. The canal at Rome is supplied with water by a feeder from the Mohawk, at such distance above its junction with that stream as to give a fall from the canal to the river—

	Fall.	Distance by water.
Where there is one lock of	9.75 feet.	
Thence to the canal at German Flats the fall is	47.34 do.	43 miles.
Thence canal one mile long, with one lock at each end,	10.00 do.	1 do.
Thence to the canal at Little Falls,	2.10 do.	4 do.
Thence canal at Little Falls, six locks,	42.00 do.	0¾ do.
Thence to Schoharie creek,	47.98 do.	36 do.
Thence to Schenectady,	62.67 do.	21½ do.
Total fall from canal at Rome to Schenectady,	221.84 feet,	106¼ miles.
From thence to Hudson river, by estimation, which cannot be far from the truth,	200.00 do.	15 do.
Total fall from canal at Rome to tide water,	421.84 feet,	121¼ miles.

	Fall.	Distance by land.	Dist. by water.
From canal at Rome to Little Canada creek there is one lock at west end of canal, and four locks and dams in Wood creek,	32.00 feet.	4 miles.	5 miles.
From Little Canada creek to Oneida lake,	27.86 do.	9¾ do.	17¾ do.
Oneida lake,	-	20 do.	20 do.
From west end of Oneida lake to Three River point, the fall is estimated, no levels having been taken,	13.00 do.	7 do.	18¾ do.
Thence to Oswego Falls, estimated,	25.00 do.	11 do.	11 do.
Thence to Lake Ontario,	75.00 do.	12 do.	12 do.
Add the portage at Oswego Falls,	18.00 do.	1 do.	1 do.
Total fall from canal at Rome to Lake Ontario,	190.86 feet.	64¾ miles.	85½ miles.

Wood creek at this place is a small stream, sufficient to carry a saw-mill in the spring and fall, but not in the driest season of the year. It would be of little use to measure the quantity it will supply per minute at this season, when the streams are full. We know it is not sufficient to supply the contemplated canal, before it receives Little Canada creek, which is something larger; but the feeder from the Mohawk will be the principal reservoir, and it is believed to be amply sufficient for the purpose. The land, generally, on one or the other bank of the Mohawk, is interval, with rising ground back from the river, so that a canal may be carried to the higher ground, or continued on the interval, at pleasure. The canal at Little Falls was cut a part of the distance through limestone rocks, and at great expense. Below the locks the river is deep, and current moderate, as far as the high rocky banks continue, say one mile and a half. The greatest difficulty will be found at the Cohoes falls, where the banks are high, of slaty rock, and a fall of one hundred and forty feet to Hudson river. In December, 1795, William Weston, Esq., engineer of the canal company, estimated the expense of a canal and locks from the head of the falls to the tide water, at about $260,000. The land between Schenectady and Hudson river is sandy, and it is probable the rocks may be avoided by taking the canal from the river at Schenectady, or a short distance above, and keeping that level until it shall arrive within a short distance of Hudson river. This can easily be ascertained by a survey.

On the route westward from Rome, the land is generally flat on the banks of Wood creek, descending as the water descends; but from Oswego Falls to Lake Ontario the stream is rapid, and the banks high and rocky. I have never viewed the ground, but am informed it will admit of a continued canal from the falls to Fort Oswego. The dotted line on the enclosed map, from a great bend in Onondaga river to Fort Oswego, will probably be an eligible route for a canal. The land is said to descend regularly westward, and the saving in the distance will be considerable. No tunnel will be necessary in the whole route, and very little deep digging. Except the Cohoes falls, the land is well situated for the proposed improvement.

The question respecting the elevation of Lake Erie above Lake Ontario I can only answer, from a general understanding that it is about two hundred and thirty feet, and the banks below the falls high and rocky. A Mr. Prescott, of Northampton, Massachusetts, surveyed the ground some years ago, and a company was incorporated for opening a canal; but the work was not commenced, nor have I heard whether any shares in the stock of the company were taken up.

The Mohawk, below Oriskany creek, is sufficient to supply a canal large enough for an Albany sloop; but I think it too small at this place in a dry season. Those sloops are badly constructed for a canal navigation. Long flat-bottomed boats, from thirty to forty tons, drawn by horses, would be much more useful vessels in a canal of such length. Such boats might answer in North river, but not in the lakes.

The streams that empty into Lake Erie are so much higher than Seneca lake, that a canal is doubtless possible; but, considering the importance of the communication with Lake Ontario, and the great difference in the expense, a canal by Oswego would unquestionably be the most eligible; besides, a canal at Niagara will soon be indispensable; and this must be of sufficient size for vessels that navigate the lakes.

The points united by canals are represented on the enclosed map. Each lock is seventy feet long, and twelve feet wide in the clear, and will admit boats drawing two feet water.

At Little Falls, there are six locks of stone; at German Flats, two stone locks; at Rome, two stone locks; and on Wood creek, four locks of timber, in the bed of the creek; the water obstructed by a dam at each lock. This kind of improvement extends from the canal here to Little Canada creek, and is of much use; but the dams and locks will soon decay. The canals are sufficient for boats that draw two feet water, twenty-four feet wide at bottom, with sloping banks; so that, when there is two and a half or three feet depth of water, it is thirty-two feet wide at the surface of the water. The canal at Little Falls, being cut through rocks, is in some places narrower. Before the canals were cut, the common sized boats were one ton and a half burthen; they are now from three to ten tons burthen.

The Vice President has frequently visited this part of the State, and can give you correct information of the land on the Mohawk, and the facility of making a canal on the low or higher ground, at pleasure; and also of crossing the river when necessary, to avoid great streams, and save the expense of arching. I have lately seen a scheme of lottery granted in the State of Ohio for improving the navigation of Cayahoga and Muskingum rivers. Samuel Huntington, Esq., one of the judges in that State, is a manager, and, I believe, a president of a canal company. One of the agents of the company called on me for information, and represented the Cayahoga to be now navigable for small boats, and that but little more improvement was then contemplated than clearing out the timber, and making a good road six miles from that river to Muskingum.

The improvement of this route, and also from Presque Isle by French creek to Pittsburg, may be considered an object worthy the attention of Government.

I have the honor to be, with great respect, your obedient servant,

GEORGE HUNTINGTON.

Honorable ALBERT GALLATIN.

To the Honorable the Legislature of the State of New York, in Senate and Assembly convened. The directors of the Western Inland Lock Navigation Company respectfully report:

That in the summer and fall ensuing the establishment of the said company by the act of March, 1792, surveys were made on the Mohawk river from Schenectady to Fort Schuyler, and on the Wood creek from that place to its termination on the Oneida lake.

The object of those surveys was to ascertain what improvement the navigation was susceptible of, and what, in particular, were the greatest obstructions to the water transportation of the agricultural produce of the interior of the State. The result was an impression favorable to the objects of the institution, and was followed by a determination, on the part of the company, to begin operations at the Little Falls in Herkimer county, which created a portage where all boats navigating the Mohawk river, with their cargoes, were transported nearly one mile over land; an operation attended with unavoidable delay and great expense, as well as with injury to the boats and their cargoes. The work was accordingly commenced in April, 1793, with nearly three hundred laborers, besides a competent number of artificers; but its progress was arrested early in September, for want of funds; many of the stockholders having neglected to pay the requisitions made by the directors, either because they had not the means to supply such advances, or from an apprehension of the impracticability of succeeding in the operation.

In January, 1794, the work was recommenced, although feebly, and some progress made, in hope that the Legislature would afford assistance by grants or loans of money, or by taking unsubscribed shares. Accordingly, the Legislature, sensible of the propriety of relieving the stockholders in one or other of these modes, and appreciating, with that discernment which has invariably characterised the Legislature of this State, the advantages the community at large would derive from the accomplishment of the important undertaking which they had encouraged individuals to attempt, directed a subscription, on the part of the people of the State, of two hundred shares. This measure was attended with the most salutary effects. The hopes and confidence of the company were revived, and the works recommenced in May, 1795, with a correspondent degree of alacrity. But the very high price of agricultural produce creating a most extensive demand for labor it was found impossible to obtain such a number of workmen as were requisite to finish the works before the end of the summer, and it was not until the 17th of November that the canal and locks were so far completed as to afford a passage to boats.

As a description of the country through which the canal is carried, a detail of its foundation, and a delineation of the beneficial effects which already have been, and hereafter will be experienced from it, may not be uninteresting to the community, and in particular to the Legislature, whose deliberations have the interest of their constituents so constantly in view, we beg leave to exhibit the following summary:

The canal is drawn through the northern shore of the Mohawk river, about fifty-six miles beyond Schenectady. Its track is nearly parallel to the direction of the waters of the fall, and at a mean about forty yards therefrom. It is supplied with water from the river above the falls, commencing in a natural basin, whose position secures the guard lock (which is placed at the extremity of the canal) from any injuries which might be apprehended to arise from ice or drift wood in times of freshets. From the basin, extending in an oblique direction across the stream to the opposite shore, a *dam* has been thrown, which, by creating an additional depth of water of twelve inches, saved the great expense which would have attended the excavation of the canal through the solid rock to procure the same depth of water, and has also materially improved the navigation of the river for a considerable distance upwards. The length of the canal is four thousand seven hundred and fifty-two feet, in which distance the aggregate fall is forty-four feet seven inches. Five locks, having each nearly 9 feet lift, are placed towards the lower end of the canal; and the pits in which they are placed have been excavated out of solid rock of the hardest kind. The chamber of each lock is an area of seventy-four feet by twelve in the clear; and boats drawing three feet of water may enter it at all times. The depth of water in all the extent of the canal is various, but not less than three feet in any place. A waste wear is constructed to discharge the surplus water entering the canal, from two small rivulets which intersect its course. About two thousand five hundred and fifty feet of the canal is cut through solid granite rock, and when the level struck above the natural surface of the earth, or rather rock, strong and well constructed walls were erected, supported by heavy embankments of earth, to confine the earth and keep the level; hence, there is no other current in the canal than an almost imperceptible one when the paddles of the locks are raised. Three handsome and substantial bridges are thrown over the canal, at so many roads which have been intersected by it.

The following state of facts will evince the beneficial influence this important work has had on the transportation to market of the produce of the country beyond the falls; and on the return of the necessary supplies for the consumption of our useful, hardy husbandmen in that quarter, employed in reducing a wilderness to smiling fields, promoting their own happiness, and the commerce and respectability of the State.

The falls, previous to the improvements above stated, being impassable, even for empty water craft, these, with all their cargoes, were transported by land, over a road as rough, rocky, and bad as the imagination can conceive; of necessity, therefore, the boats were of such a construction as might be transported on a wheel carriage, consequently of little burthen, seldom exceeding a ton and a half; each boat was navigated by three men; and a voyage from Schenectady to Fort Schuyler, a distance of one hundred and twelve miles, and back to the former place, was seldom made in less than nine days. Thus, the transportation of a ton of produce, if no back freight offered, was equivalent to one man's wages for eighteen days. The canal and locks will admit the passage of boats of thirty tons burthen with facility; but impediments in the river, still to be removed, between Schenectady and the Little Falls, prevent the use of boats of more burthen than ten or eleven tons; each of these is navigated by five men, and make the same voyage in fourteen days, which is at the rate of seven days' wages of one man for one ton. But until the im-

provements shall be completed, which are contemplated to be made in the river above and below the falls, these boats, when the water in the river is at its lowest state, which is usually from the middle of July to the end of September, can only convey about five or six tons during that period; then the transportation of a ton between the places aforesaid is equal to the wages of one man for fourteen days, affording still an important saving, exclusive of that which arises from the speedy passage of the boats through the canal and locks; the whole time taken up to pass through both not exceeding three quarters of an hour; but transported as heretofore, by land, caused a detention at least of one day, and frequently of a longer time.

Early in the spring of 1796, the directors commenced their operations at Fort Schuyler; their object was to effect a junction of the waters of the Mohawk with those of Wood creek, by means of a canal between the respective landing places; the difficulty of procuring laborers, from the existence of the causes before mentioned, prevented the completion of the work that season; but during the winter of 1796 and 1797 the necessary arrangements having been made, a sufficient number of men were obtained, who recommenced the work in April last; and, although there was a considerable extension of the original plan, yet the whole was opened for the passage of boats on the 3d of October. As the beneficial consequences resulting on these improvements extend much further than the mere removal of the portage, it may not be improper to enter into a detailed account of the *former* and the *present* modes of transportation.

Previous to the completion of the canal, the commerce of the western parts of the State was carried on by means of the batteaux before described, carrying, on an average, one ton and a half. On their arrival at the landing place, the boat was unladen, hauled out of the water, and conveyed, together with the cargo, on wagons across the carrying place, to Wood creek, where, if it happened that there was a sufficiency of water, the cargo was taken on board again, and the boat, aided by a *flush* from a mill-dam, descended the creek to the Oneida lake; but if the water was low, (which was generally the case from the beginning of June to October,) the lading was conveyed five miles further to Canada creek, along a road scarcely passable. The *delay* and consequent expense at this season was very great; the difficulty of ascending was still greater; the boat was unladen at Canada creek, and, as the state of the road would not admit of *its conveyance by land*, oxen were applied, and by main strength dragged it along the bed of the creek, to the great detriment and injury of the boat.

On the most moderate calculation it may be affirmed, that the delay in passing over the carrying place was, on an average, one day, and frequently much more; while at present the boats, with a *greater quantity* of goods on board, and without sustaining the smallest injury, pass over the same space in three hours, and the remainder of the voyage to the Oneida lake is much facilitated and expedited by means of the additional quantity of water which is thrown into the creek. Formerly it was the stated custom to collect the waters of Wood creek in the mill dam during the night, and early in the morning to discharge the same, which creating a temporary *flush*, such boats as were in readiness availed themselves thereof. But if they arrived a few minutes after the discharge, they were detained until the following morning, whereas at present the regulations are such that the time of arrival is immaterial, and the voyage is continued without interruption or delay.

The length of the canal from the Mohawk to Wood creek is two miles and three chains, one-third of which distance is cut through a gravelly hill from twelve to eighteen feet in depth. The width is thirty-seven and a half feet, and boats drawing three and a half feet of water may pass freely along it.

A lateral branch is cut from the canal to the Mohawk river, upwards of five hundred yards in length, and from ten to twelve feet deep; by means of this feeder any quantity of water can be taken into the canal and discharged into Wood creek or the Mohawk, as circumstances may require. To regulate the supply, and to prevent the works being injured by the *freshets*, a large regulating waste weir is constructed across the feeder; another of a similar form is erected near Fort Newport, for the purpose of furnishing the necessary supplies of water to Wood creek; and it is found by experience, that these devices fully answer the most sanguine expectations, as now Wood creek is rendered at least equal to any part of the navigation between thence and Schenectady. There is a lock at each extremity of the canal, the one of ten feet lift, and the other of eight feet. Five handsome and substantial bridges are constructed over the canal and feeder.

Wood creek has been considerably improved by cutting through several isthmuses so as to shorten the distance near seven miles, and also by the removal of the timber, which had fallen into it in such quantities as almost altogether to obstruct the navigation.

The channel of the Mohawk below Fort Schuyler being in the same situation, a party of men were employed the last summer in removing these obstacles, and considerable progress was made therein. The most difficult part is cleared, extending from the canal to Six Mile creek; the remaining part from the last-mentioned place to the German Flats will be finished the present year. At the German Flats a canal has been commenced for the purpose of avoiding two bad rapids, known commonly by the names of *Wolf's and Orendorff's rifts;* the cutting is nearly completed, and the whole will be so far advanced as to admit the passage of boats in a few months. At the west end a guard lock will be placed, similar in form, and for the same purpose as that at the Little Falls, before described. At the east end the boats will pass through another lock of twelve feet fall into very good water which continues to the canal at the falls, a distance of nearly five miles. Above the guard lock, and at the head of Wolf rift, a dam will be thrown across the Mohawk, so as to raise the water thereof three feet, which will materially improve the navigation above, by affording a sufficient depth of water over the *shallows* opposite to Aldridge's and Fort Herkimer.

The next object to which the directors mean to bend their attention, is the clearing the bed of the river below the Little Falls, from the *rocks*, *stones*, *sandbars*, and *other obstacles*, which at present so greatly interrupt the navigation. The work commenced late last season, and considerable progress was made in blowing up the large massy rocks, which rendered the passage of the Haycock rapid so dangerous. The work will be resumed as soon as the waters subside, and will progress regularly downwards.

The directors, aware of the difficulty of improving effectually the river from Schoharie to Schenectady, directed their engineer to survey the southern shore to determine the most eligible route for a canal, and to make an estimate of the expense that would attend the execution; and, as an opinion had been entertained that the line might be extended to *Albany* by preserving the level from Schoharie creek to the vicinity of *Schenectady*, (which it was imagined was sufficiently elevated to surmount the intermediate ground between the two places,) the directors, always willing to promote every object that has in view the public good, further directed their engineer to ascertain the practicability of the measure. From his report it appears that the summit ground between Albany and Schenectady is elevated one hundred and forty-five feet above the surface of the Mohawk at Claus Veeles, three miles above the last-mentioned place; and that the *rise* from thence to Schoharie is only seventy-one feet; consequently the depth to be cut through for some miles would have been nearly seventy-four feet, which sufficiently proves the impracticability of the plan. If even the level from Schoharie creek could be kept, which, on account of rocky mountains and deep ravines would be next to impossible, and although a *canal* may be drawn along the southern shore of the Mohawk from Schoharie to Schenectady, yet from the length of the line, and the nature of the ground

it must pass through, the expense of execution would be so great, that the directors are of opinion that the present trade of the country would not warrant their undertaking a work of such magnitude. They have, therefore, determined to confine their operations to the bed of the river, and to make such improvements therein as it is susceptible of.

With respect to the improvements to the westward of Fort Schuyler, the directors beg leave to observe, that from the outlet of the Oneida to the south end of the Cayuga Lake, nature has done so much that little is left for art to accomplish. The few obstructions necessary to be removed may be effected in the course of one summer, and at a very moderate expense; which, when completed, would form a navigation from Schenectady westward of near two hundred and eighty miles in extent, and through a tract of country, perhaps, on the whole, unrivalled in point of fertility. The immense advantages that must result from the accomplishment of this great object, both to the western and southern parts of the State, are too striking to escape the attention of a mind the least informed.

The communication with Lake Ontario by the Onondaga river, although at present so eligible as to need little improvement as far as the falls (twelve miles from Lake Ontario) is from thence to the lake so interrupted by an almost continued series of rapids, and the adjacent shores being high, steep, and chiefly of solid rock, will render the cutting of a canal on the adjacent shore absolutely impracticable. The only mode will therefore be improvements in the bed of the river by means of dams and locks, unless some more eligible route can be discovered for a communication between the Lakes Oneida and Ontario; and it has been suggested that the country intermediate between Rotterdam on Lake Oneida, and that part of Lake Ontario where Salmon river falls into it, is such that a canal may be drawn across. The sources of two rivulets, which discharge themselves in different directions into the respective lakes at the above-mentioned places, are very near to each other; if, on examination, it should appear that when united they are sufficiently copious to supply the summit level, and the ground should prove favorable, there can be little doubt but it would be the most eligible line of communication. If the harbor at the mouth of Salmon river is equally good with that at Oswego for vessels navigating the lake, the length would not probably exceed eighteen miles, which is thirty miles shorter than by the Onondaga river. It is not possible to form any idea of the lockage on either route until an actual survey has been made; which it is the intention of the directors to cause to be done the first convenient opportunity.

The directors would beg leave further to represent to the Legislature that some alterations and amendments to the existing laws in respect to the said company have become necessary or expedient.

From the preceding statement of the exertions of the company, and the progress they have made, it must be obvious that no unnecessary delay is to be imputed to them; and they therefore respectfully solicit an extension of the term of five years, allowed by the act of the 30th March, 1792, for completing the navigation between Schenectady and the Wood creek to the further term of five years, to be computed from the 1st day of January last.

Large sums of money have already been expended by the company in removing trees out of the bed of the river Mohawk and Wood creek, which had either accidentally fallen therein from its banks, or were intentionally cut down and drawn therein for the purpose of clearing the adjacent ground; of the latter an immense number have been brought into the river subsequent to the commencement of the operations for removing those there out, which had previously obstructed the navigation. To remedy this inconvenience in future, the directors respectfully represent that it would conduce to the attainment of the beneficial ends of the establishment if such further legislative provision was made in the premises as would enable them or their agents to cut down the trees on the banks of the Mohawk, Wood creek, and other streams through which their improvement may be carried to the distance of two perches from the banks; and to draw and lay upon the shores such of the water-soaked timber, which, when raised from the bed of those streams, will not float down the same; and either to burn or preserve the timber so cut down or taken out for the use of the respective proprietors of the soil where the same is cut or laid at the option of the latter.

The directors have also found by experience that the mode pointed out by the seventh section of the same act, for ascertaining the value of lands to be taken by the company for the necessary accomplishment of their works, is in some respects extremely injurious and expensive, and that justice requires some amelioration of its provisions. One instance has occurred in which the jury assessed the damages of the individual at *one dollar*, and the costs incurred by the company were *three hundred and seventy-five dollars*. They would, therefore, respectfully submit to the Legislature the propriety of altering the law in such a manner as that the process for ascertaining the damages, when the parties cannot agree, may be more expeditious, less expensive, and equally just in its effects. And the directors respectfully submit, whether a provision similar to that instituted for ascertaining the damages to be paid by the corporation of the city of Albany in prosecuting the works requisite to supply the said city with water would not be an eligible provision.

The company have expended in improving the bed of the Mohawk, in straightening and improving Wood creek, in completing the locks and canals at Fort Schuyler, the canal and locks at the Little Falls, and upon the canal at the German Flats, about $209,357.

The directors apprehend the expenditures this year will cost about $50,000.

The requisitions on the stockholders for the year past have not been sufficient to defray all the expenses which have accrued, and the directors have been under the necessity of borrowing $39,950: besides which sum, they are indebted to the State $37,500.

About one hundred and fifty shares remain on hand, as forfeited by former stockholders, or unsubscribed, and considering how deeply interested the State at large is in the success of so extensive a plan of inland navigation, the directors apprehend the Legislature would be induced to take the aforesaid shares at the same rate as the shares are held by the present stockholders. The sum required will be sixty pounds each share, and subject to the future requisitions of the directors. This proposal being acceded to by the Legislature, the directors will be enabled to prosecute the works with vigor, but should it be rejected, they apprehend the money that may be required will be difficult to be raised from the stockholders, and in consequence further operations arrested for the present year, whereby the minds of the public and individuals will be much discouraged.

It would be proper to state to the Legislature that the tolls received in 1797 at the Little Falls was $2,871 49, and that after this year the directors expect to receive at that place for tolls $6,000, on account of the canal and locks at German Flats, and improvements made in the river; and the canal at Fort Schuyler they expect will produce $4,000. That, on the whole, they hope, after the present year, the company will be enabled to make a dividend of four per cent. on their capital.

The directors, in justice to their engineer, beg leave to remark that they have the greatest confidence in his abilities, and as a person of such singular qualifications is exceedingly difficult to be obtained, the directors are fearful that if the work should be arrested for want of funds, they may lose the opportunity of availing themselves of his services; a loss they cannot calculate, as years may elapse before, if ever, they may be able to procure a person possessed of such handsome qualifications.

Complaints have prevailed that the toll established for the passage of boats and their cargoes through the canal connecting the waters of the Mohawk with Wood creek was extravagantly high; the directors have therefore deemed it necessary to subjoin to this report a statement comparing the present with the former expense of transportation over the carrying place at Fort Schuyler, with some observations pertinent to the subject.

By order of the Board of Directors of the 16th of February, 1798.

PH. SCHUYLER, *President.*

Previous to the commencement of the operations of the Canal Company, the navigation of the Mohawk river between the German Flats and the landing at Fort Schuyler was so interrupted by trees which had fallen into it, or intentionally cut and thrown into it, as to render the passage even of the smallest boats almost impracticable. Wood creek was in all its extent, at least in an equally unnavigable situation, and from the same cause the latter has been cleared at an expense exceeding one thousand pounds; the operations on the former have already cost a greater sum; and when both shall be completely cleared, a continued annual expense will still accrue by taking out the timber which will subsequently fall into these streams. A reimbursement of the expenses of those improvements which have so greatly facilitated the navigation as that boats of ten or eleven tons already navigate the Mohawk; and boats of equal burthen passing the canal will soon be used in Wood creek, and proceed to and from the Cayuga Lake and Seneca Falls, can only be obtained by adding an additional toll to that formerly passing the canal at Fort Schuyler, as that is the only place of collection beyond the falls; but the statement which will follow will evince that the transportation by the canal, although apparently higher than heretofore, is in reality lower.

Wood creek has generally, from the beginning of June to the close of the navigating season, so little water that the smallest boat cannot pass to and from Canada creek without artificial aid, and this was afforded by means of water collected in Mr. Lynch's mill-dam; and if the boat and cargo was transported from the landing in the Mohawk to that in Wood creek, sufficiently early in the day to have the benefit of the water which had been collected in the night, the boat was enabled, with part of her cargo, to descend the creek, and the remainder of the cargo was conveyed five miles further by land to Canada creek; but lest this should be considered as mere assertion by those to whom the fact is not notorious, the following instance is produced:

The agents appointed to confer with the Oneida, Onondaga, and Cayuga Indians in 1795, arrived at the landing in the Mohawk river nearly at sunset on the 10th of July, with four batteaux, navigated by three men each, and the lading of none of which amounted to one ton and a half; the boats and part of their cargo were transported to Wood creek on the next day. On the 13th, the boats, aided by the waters of the mill-dam, descended to Canada creek, where they arrived at dusk, and about an hour after, the last of the cargo transported by land also arrived; one of the carriages having upset and damaged several of the articles with which it was laden. Thus, two entire days were expended in passing from the landing in the Mohawk, to Canada creek, a distance of about seven miles by land and ten by land and water. The charges as stated by Mr. Bernard, are as follows:

Philip Schuyler, Esq., to John Bernard, Dr.

1795. July 12. To seven loads carried to Canada creek, at £1 each,	£7 0 0
To three loads to Wood creek at five shillings,	0 15 0
To four batteaux to Wood creek, at five shillings,	1 0 0
Total of Mr. Bernard's account,	£8 15 0
Twelve batteauxmen paid for two days at eight shillings each, per day, is	9 12 0
	£18 7 0

This sum of £18 7*s.*, then, was the expense of transporting less than six tons of cargo from the Mohawk to Canada creek, which is per ton, £3 1 2

But twenty shillings being the then price of conveying a boat and its cargo to Wood creek, and it may, in the spring of the year, when the waters are high, descend fully laden to Canada creek, which it will reach in one day, the pay for the batteauxmen will then be only 24*s.* making, together, £2 4, or per ton, £1 9 4

To which add the charge when the water is low, as above stated, of, 3 1 2

Then the mean price throughout the navigating season will be 2 5 3

But subsequently to 1795, Mr. Bernard's charge for transporting a boat to Wood creek has been 6*s.* and the same for a wagon load of the cargo, and from 20*s.* to 24*s.*, say 22*s.*, for a wagon load to Canada creek; hence, the mean price for transporting a ton will be found to be £2 8 4.

The contrivance for supplying Wood creek with water from the Mohawk, by means of the canal, is such that, when the water which Wood creek affords is so little as not to float down even an empty boat, a plenty is given for the deepest laden one, and boats pass from the Mohawk river to the western country without unlading, and at the following expense, by established tolls:

A batteau navigated by three men, and loaded with a ton and a half,	£3 0 0
They can with ease reach Canada creek in less than half a day; hence the wages for detention does not exceed	0 12 0
Which is per ton,	2 8 0

And is 4*d.* per ton less than Mr. Bernard's charges with the usual detention; exclusive of the damages to the boat and cargo, by unlading, relading, and being transported in wheel carriages.

Hence, it appears that no toll is taken for the improvements in the Mohawk and Wood creek, which have removed obstructions so greatly detrimental to the navigation, as almost entirely to impede it.

But there are still other advantages resulting to the community from the operation of the canal, and the improvements made by the company; for, let it be supposed, that a merchant has eighteen tons of merchandise at the landing in the Mohawk river, to be conveyed to the Cayuga lake, nine of which to go in boats carrying one and a half tons navigated by three men, and the other to be conveyed in a boat carrying nine tons, for such a vessel may descend Wood creek when two or three bents are straightened, which will be in the next year, and then the expense will be as follows:

The mean charge for a ton to Canada creek in batteaux, as above stated, is	£2 8 4
And it will go to the Cayuga lake and return to Canada creek in eight days; the wages of the batteauxmen will then be £9 12, or per ton,	6 8 0
Making, together,	£8 16 4

This sum is then the charge for conveying a ton from the Mohawk to the Cayuga lake.	
For a vessel carrying nine tons, and navigated by five men, the toll through the canal is -	£1 12 0
The toll on nine tons of lading through the canal is - - - - -	14 8 0
Half a day to go to Canada creek, for five men, is - - - - -	1 0 0
	£17 0 0
Which is per ton, - - - - - - - -	£1 17 9⅓
The vessel will go to Cayuga lake, and return to Canada creek in twelve days.	
Wages of the men £24; which is per ton, - - - - -	2 13 4
Total charge per ton by the canal, - - - - - -	£4 11 1⅓

Which deducted from £8 16*s.* 4*d.*, the charge when carried in the batteaux, produces a saving per ton of £4 5*s.* 2½*d.* and evinces, at once, the utility of the canal, and the moderation of the tolls, if, in fact, that was not already evinced by the toll received in the expenditure by the company, which has not yet produced three per cent.

Besides, if the canal had not been so constructed, no supply of water could have been obtained from the Mohawk to aid the navigation of Wood creek; and as it is perfectly evident that so very small a stream as Wood creek is between the landing and Canada creek, it must, in a very few years, have become entirely unnavigable by clearing of the lands adjacent to the spring from whence it issues; and then boats, as well as their entire cargoes must be transported by land to Canada creek in all the dry season of the year, and at a mean price per ton through the year, of upwards of £3; and as, in that case, none but small boats could be employed, the expense of transportation from Schenectady to the western country must, of necessity, be much more than double the expense of transportation by the canal and improvements of the company.

AN ACT for establishing and opening lock navigations within this State, passed the 30th March, 1792.

Whereas a communication by water between the southern, northern, and western parts of this State, will encourage agriculture, promote commerce, and facilitate a general intercourse between the citizens: Therefore,

Be it enacted by the people of the State of New York, represented in Senate and assembly, and it is hereby enacted by the authority of the same, That there shall be established two companies of stockholders; one for the purpose of opening a lock navigation from the now navigable part of Hudson river, to be extended to Lake Ontario and to the Seneca lake, and to be called and known by the name of "The President, Directors, and Company, of the Western Inland Lock Navigation, in the State of New York," and one other company for the like purpose, from the now navigable part of Hudson river to Lake Champlain, and to be called and known by the name of "The President, Directors, and Company, of the Northern Inland Lock Navigation, in the State of New York." That the capital stock of the said western company shall consist of one thousand shares, and the capital stock of the said northern company shall consist of one thousand shares, and that subscriptions for shares in the said companies, respectively, shall be taken in manner following, to wit: Samuel Jones, David Gelston, Comfort Sands, Melancthon Smith, and Nicholas Hoffman, or any three of them, shall be a Board of Commissioners for taking subscriptions in the city of New York; and Abraham Ten Broeck, John Tayler, Philip S. Van Rensselaer, Cornelius Glen, and John Ten Broeck, or any three of them, shall be a Board of Commissioners for the like purpose in the city of Albany. And each board shall provide two books, one for the western and one for the northern navigation, and shall enter in each book as follows: We whose names are hereunto subscribed, do for ourselves and for our legal representatives, promise to pay to the President, Directors, and Company, of the —— Inland Lock Navigation, in the State of New York, established and incorporated by the act, entitled "An act for the establishing and opening lock navigations within this State," such sums of money for each share, (which we or our legal representatives shall from time to time hold in the said corporation,) and in such proportions, and at such time and times, as the president and directors aforesaid shall direct and require, in addition to the sums which shall have been retained in the hands of the commissioners, appointed by the said act. And the said Boards of Commissioners, respectively, shall open the books for taking in subscriptions for the purposes aforesaid, on the first Tuesday of May next, and shall take the subscriptions of every person who shall offer to become a subscriber, from day to day, (Sunday excepted,) until the last Tuesday of the said month, and the commissioners first above named shall, at least ten days previous to the first Tuesday of May, give notice of the day on which the subscription books shall be opened, and of the day inclusive on which they will close, in the newspaper printed by the printer to this State; and the other commissioners shall give like notice in at least one of the newspapers printed in the city of Albany, and another at Lansingburg, in the county of Rensselaer: *Provided, always*, That every subscriber shall, at the time of subscribing, pay unto the commissioners with whom he or she shall subscribe, the sum of twenty-five dollars in gold or silver, bills of credit of this State, or notes issued by the Bank of the United States, or the Bank of New York, for each share by him or her subscribed; and if any subscriber shall, at the time of subscription, pay for more shares than shall eventually be certified by the said commissioners, then, and in every such case, the commissioners shall retain no more of the subscription money in their hands than will amount to the shares so certified, at the rate of twenty-five dollars for each share, and return the overplus to the subscriber entitled thereto; *And provided further*, That within the period above mentioned, no person or body politic or corporate, shall subscribe more than ten shares. And the commissioners by this act appointed in the city of Albany, or any three of them, shall, on the day next before the last Tuesday of May, or as soon thereafter as may be, certify under their hands and seals, to the commissioners appointed in the city of New York, a true list of the subscribers in their book, with the true number of shares subscribed by each; and if it shall appear to the commissioners appointed in the city of New York, or to any three of them, that one thousand shares have not been subscribed to each company, they shall, by advertisement, to be published in the newspaper of the printer to this State, give notice that, on a day certain, which shall not be less than eight days from the first publication of said notice, their books will again be opened, and that they will continue to receive subscriptions from day to day for the space of four days, or until one thousand shares in the whole have been subscribed; and on such last subscription, any person or body politic, or corporate, may subscribe any number of shares at pleasure, not exceeding the deficiency, and if at the end of the said four days one thousand shares shall not be so subscribed, then the books shall be closed; and it shall and may be lawful for each of the said companies, after they shall have become incorporated in manner herein prescribed, to take in subscriptions for the deficient shares or not, as to the stockholders of each of the said corporations shall seem proper; but if it should appear to the said commissioners first herein mentioned, that on

the said last Tuesday of May, the aggregate of all the shares subscribed exceed one thousand, the excess shall be deducted from the respective subscribers to each company in manner following, to wit:

1st. If the whole number of subscribers amount to one thousand, whatever may be the number of shares subscribed, each subscriber shall be entitled to one share.

2d. If the whole number of subscribers exceed one thousand, it shall be determined by lot, by the said commissioners, which of the subscribers shall be entitled to a share, and which not.

3d. If the number of subscribers are less than one thousand, and the number of shares by them subscribed exceed one thousand, then those who have only subscribed one share shall be entitled to such share, and the remaining subscribers shall be classed into nine classes, one class to consist of all those who have subscribed two shares; one class of those who have subscribed three shares; one class of those who have subscribed four shares; one class of those who have subscribed five shares; one class of those who have subscribed six shares; one class of those who have subscribed seven shares; one class of those who have subscribed eight shares; one class of those who have subscribed nine shares; and one class of those who have subscribed ten shares; after which the shares to be deducted from each class shall be determined by the following rule, to wit: As the aggregate of all the shares subscribed by the nine classes is to the excess above one thousand, so is the aggregate of the shares subscribed by any class, to the shares to be deducted from that class. The aggregate deduction to be made from each class being thus determined, if such aggregate is less than one share for each subscriber, it shall be determined by lot which of the subscribers shall hold two shares. If such aggregate is more than one share to each subscriber, it shall be determined by lot which of the subscribers shall hold one share, and the like rule shall be applied to the deduction in each of the other eight classes. And the said commissioners appointed in the city of New York shall then make out full and perfect lists of all the subscribers to the stock of each company, respectively, with the number of shares to which each subscriber is entitled, and having acknowledged the same before the chancellor, or one of the judges of the supreme court, they shall deliver the same to the person administering the Government of this State for the time being, and if it shall appear to him that five hundred shares are subscribed to the company known by the name of "The President, Directors, and Company, of the Western Inland Lock Navigation, in the State of New York," he shall direct the list to be filed and entered of record in the secretary's office of this State. And if it shall appear to him that five hundred shares are subscribed to the company known by the name of "The President, Directors, and Company, of the Northern Inland Lock Navigation, in the State of New York;" he shall give like directions to the secretary relative to the list thereof.

And be it further enacted by the authority aforesaid, That immediately from and after the filing and recording, in manner aforesaid, the list of subscribers to the western company, the persons therein named as subscribers, whilst they continue stockholders therein, and all others who shall become stockholders therein, shall be, and are hereby, created and made a corporation and body politic, in fact and in name, by the name and style of "The President, Directors, and Company of the Western Inland Lock Navigation, in the State of New York;" and that, by that name, they and their successors forever shall, and may, have perpetual succession; and that, immediately from and after the filing and recording, in manner aforesaid, the list of subscribers to the northern company, the persons therein named as subscribers, whilst they shall continue stockholders therein, and all others who shall become stockholders therein, shall be, and are hereby, created and made a corporation and body politic, in fact and in name, by the name and style of "The President, Directors, and Company of the Northern Inland Lock Navigation, in the State of New York;" and that, by that name, they and their successors forever shall, and may, have perpetual succession; and, by those names, shall be, and hereby are, respectively, made persons able and capable in law, to have, purchase, receive, possess, enjoy, and retain, to them and to their respective successors, lands, rents, tenements, hereditaments, goods, chattels, and effects, of what kind, nature, or quality soever, to the amount of $300,000 each, and the increase and profits thereof, and of enlarging the same, from time to time, by additional payments of the stockholders in such companies, respectively, and in such manner and form as they shall think proper, if such additional payments shall be found necessary to fulfil the intent of the incorporations hereby created and made, and hereinafter particularly specified and directed, and to no other use, intent, and purpose whatsoever, and the same estate or estates, or any part thereof, to sell, grant, demise, alien, or dispose of; and to sue and be sued, plead and be impleaded, answer and be answered unto, defend and be defended in courts of record, or any other place whatsoever; and also to make, have, and use a common seal, and the same to break, alter, or renew at their pleasure; and also to ordain, establish, and put in execution, such by-laws, ordinances, and regulations, as shall seem necessary and convenient for the government of the said corporations, respectively, not being contrary to the law of this State, or to the constitution thereof; and generally to do and execute all and singular acts, matters, and things, which to them it shall or may appertain to do; subject, nevertheless, to the rules, regulations, restrictions, limitations, and provisions, herein prescribed and declared.

And be it further enacted by the authority aforesaid, That, for the well-ordering of the affairs of the said corporations, respectively, there shall be thirteen directors for each corporation, of whom there shall be an election, after the present year, on the first Monday of May, in every year, by the stockholders and proprietors of the capital stock of each of the said corporations, and by a plurality of votes actually given by such stockholders, in person, or by their legal proxies; and those who shall be duly chosen at any election shall be capable of serving as directors, by virtue of such choice, until the end or expiration of the first Monday of May next ensuing the time of such election, and until others are duly elected in their places; and the said directors, at their first meeting after each election, shall choose one of their number as president: *Provided always*, That out of the following persons in this proviso named, thirteen, and in the order in which they are named, if so many of them shall appear to be stockholders, from the record of the certificate hereinbefore mentioned, shall be, and hereby are, appointed the first directors of the corporation, by virtue of this act, to be instituted by the name of "The President, Directors, and Company of the Western Inland Lock Navigation, in the State of New York," that is to say: Philip Schuyler, Leonard Gansevoort, Jeremiah Van Rensselaer, Elkanah Watson, John Tayler, Jellis A. Fonda, Wm. North, Goldsbrow Banyar, Daniel Hale, John Watts, Walter Livingston, Dominic Lynch, James Watson, Mathew Clarkson, Ezra L'Homedieu, Melancthon Smith, David Gelston, Stephen Lush, Cornelius Glen, Silas Talbot, John Frey, Douw Fonda, John Sanders, Nicholas I. Roosevelt, Daniel McCormick, Marinus Willet, Jonathan Lawrance, Philip Van Cortlandt, and James Clinton. And that out of the following persons in this proviso named, thirteen, and in the order in which they are named, if so many of them shall appear to be stockholders, from the record of the certificate hereinbefore mentioned, shall be, and hereby are, appointed the first directors of the corporation, by virtue of this act, to be instituted by the name of "The President, Directors, and Company of the Northern Inland Lock Navigation, in the State of New York," that is to say: Philip Schuyler, Abraham Ten Broeck, John Williams, Stephen Van Rensselaer, Jacobus Van Schoonhoven, John Van Rensselaer, Abraham G. Lansing, Cornelius Glen, Henry Quackenbos, Robert R. Livingston, Philip Livingston, James Duane, Alexander McComb, Samuel Jones, Nicholas Low, Dirck Lefferts, William Duer, Peter Van Ness, Barnet Bleecker, Henry Livingston, Peter Gansevoort, Peter B. Tearse, Alexander Webster, George Wray, Thomas Tillotson, Mathew Scott, Zephaniah Platt, John

Thurman, Albert Pawling, and Zina Hitchcock. And if there shall not be thirteen stockholders amongst the persons whose names are mentioned, and out of which directors are to be taken in manner aforesaid, for each of the said corporations, respectively, then the deficiency in each shall be chosen in manner following, that is to say: The said commissioners, first in this act abovementioned, or any three of them, shall, immediately after the filing and recording the certificate hereinbefore mentioned, appoint a time when, and a place where, an election shall be held for electing directors for each company, and shall give at least twenty days' notice of such time and place, by publishing in the newspaper printed in the city of New York by the printer to the State, and in at least one of the newspapers printed in the city of Albany, or at Lansingburg, at which time and place directors shall be chosen in manner above directed, and at which election the said commissioners in the city of New York, or any three of them, shall preside; and a list of the directors of each corporation so chosen, shall be, by them, the said commissioners, published in the newspapers in manner aforesaid, and shall, by the said commissioners, be requested to meet on a day, and at a place, certain to be therein mentioned; and, being so met, they shall choose one of their body to be the president, and the directors and presidents so chosen shall continue in office until the end of the first Monday in May next ensuing such election, and until others are duly elected in their places: *Provided always*, That in case it should at any time happen, that an election of directors should not be made upon any day when, pursuant to this act, it ought to have been made, neither of the said corporations shall, for that cause, be deemed to be dissolved; but it shall be lawful on any other day to hold and make an election of directors, in such manner as shall have been regulated by the laws and ordinances of the said corporations, respectively. *And provided also*, That in case of the death, resignation, absence from the State, or removal of a director by the stockholders, his place may be filled up by a new choice, for the remainder of the year, by election, at a special meeting to be held for that purpose.

And be it further enacted by the authority aforesaid, That it shall and may be lawful for the presidents and directors of the said incorporations respectively to convene special meetings of the stockholders, whenever such meetings shall appear necessary, giving at least fifteen days' notice thereof in the newspapers in manner herein before directed.

And be it further enacted by the authority aforesaid, That the directors for the time being of each of the said corporations respectively shall have power to appoint such officers, agents, clerks, superintendents, engineers, workmen and others under them as shall be necessary for executing the business of the said corporation, and to allow to them such compensation for their services respectively as the said directors shall deem reasonable and proper; and shall be capable of exercising such other powers and authorities for the well governing and ordering the affairs of the said corporation as shall be described, fixed, and determined by the laws, regulations, and ordinances of the same, not contrary to, or inconsistent with, the constitution and laws of this State.

And be it further enacted by the authority aforesaid, That the following rules, restrictions, limitations, and provisions shall form and be fundamental articles of each of the aforesaid corporations, viz:

1st. The number of votes to which each stockholder shall be entitled shall be according to the number of shares he shall hold in the proportions following; that is to say, for one share and not more than two shares, one vote; for every two shares above two and not exceeding ten, one vote; for every four shares above ten and not exceeding thirty, one vote; for every six shares above thirty and not exceeding sixty, one vote; for every eight shares above sixty and not exceeding one hundred, one vote; and for every ten shares above one hundred, one vote. But no person, co-partnership, or body politic shall be entitled to a greater number than thirty votes; and after the first election no share or shares shall confer a right of suffrage which shall not have been holden three calendar months previous to the day of election. Stockholders actually resident in this or any of the United States, and none others, may be directors.

2d. Not more than three-fourths of the directors in office, exclusive of the president, shall be eligible for the next succeeding year; but the director who shall be president at the time of an election may always be re-elected.

3d. No director shall be entitled to any emolument unless the same shall have been or shall be allowed by the stockholders at a general meeting; the stockholders shall make such compensation to the president for any extraordinary attendance as shall appear to them reasonable.

4th. Not less than seven directors shall constitute a board for the transaction of business, of whom the president shall always be one, except in case of sickness or necessary absence, in which case his place may be supplied by any other director whom he by writing under his hand shall nominate for the purpose.

5th. Any number of stockholders not less than sixty, who together shall be proprietors of two hundred shares or upwards, shall have power at any time to call a general meeting of the stockholders for purposes relative to the institution, giving at least twelve weeks notice in at least one newspaper printed in the city of New York, and in at least one newspaper printed in the city of Albany, and in the town of Troy, in Rensselaer county, and specifying in such notices the object or objects of such meeting.

6th. Every treasurer, before he enters upon the duties of his office, shall give bond with two or more sureties to the satisfaction of the directors, and in such sum as the directors shall think proper.

7th. The lands, tenements, and hereditaments which it shall be lawful for the said corporations respectively to hold, shall be only such as shall be requisite for the immediate purpose for which those corporations have been created and made, and such other as shall have been *bona fide* mortgaged to it by way of security, or conveyed to it in satisfaction of debts previously contracted in the course of its dealings, or purchased at sales upon judgments which shall have been obtained for such debts.

8th. No bank shall be established by either of the said corporations, nor shall either of them enter into any money negotiations other than such as shall be immediately incident to the purposes for which the said corporations have been instituted, nor shall either of the said corporations be stockholders in any bank whatsoever, nor shall they or either of them deal in or hold any stock of funded or other debt of the United States, or of this State or any other State whatsoever.

9th. The stock of the said corporations respectively shall be assignable and transferable according to such rules as shall be instituted in that behalf by the laws and ordinances of the same.

10th. All bills or notes which may be given by either of the said corporations or their directors, signed by the president and countersigned by the treasurer or principal clerk, promising the payment of money to any person or persons, his, her, or their order, or to bearer, though not under the seal of the corporation issuing the same, shall be binding and obligatory upon the same, in like manner and with like force and effect as upon any private person or persons if issued by him, her, or them, in his, her, or their private or natural capacity or capacities, and shall be assignable and negotiable in like manner as if they were issued by such private person or persons, that is to say, those which shall be payable to any person or persons, his, her, or their order, shall be assignable by endorsement in like manner and with like effect as promissory notes now are, and those which are payable to bearer shall be negotiable and assignable by delivery only: *Provided always*, That no such bills or notes shall be issued which shall not specify the particular service or article for which they were paid: *And provided also*, That the

article or services for which they are issued were articles used or to be used for the purposes of the institution, or services performed therefor.

11th. Half yearly dividends shall be made by each of the said corporations of all the nett annual income thereof amongst the stockholders, in proportion to their respective shares, and no transfer of any share shall be made in any other manner than shall be directed by the president and directors of such company respectively.

And be it further enacted by the authority aforesaid, That each of the said corporation, by the president and directors, or by any agent, superintendent, engineer, or other person employed in the service of such corporation, may enter into and upon all and singular the land and lands covered with water, where they shall deem it proper to carry the canals and navigation herein before particularly assigned to each of the said corporations, and to lay out and survey such routes and tracts as shall be most practicable for effecting navigable canals as aforesaid, by means of locks and other devices, doing, nevertheless, as little damage as possible to the grounds and enclosures in and over which they shall pass, and thereupon it shall and may be lawful to and for the said presidents and directors respectively to contract and agree with the owners of any lands and tenements for the purchase of so much thereof as shall be necessary for the purpose of making, digging, and perfecting the said canals, and for erecting and establishing all the necessary locks, works, and devices to such navigation belonging if they can agree with such owners; but in case of disagreement, or in case the owner thereof shall be *feme coverte*, under age, *non compos mentis*, or out of the State, then it shall and may be lawful to and for the said president and directors to apply to the chancellor of this State, who upon such application is hereby authorized and empowered, enjoined and required, to frame and issue one or more writ or writs, as occasion shall require, in the nature of a writ of *ad quod damnum*, to be directed to the sheriff of the county in which such lands and tenements shall be, commanding him that by the oaths of twelve good and lawful men of his bailiwic, who shall be indifferent to the parties, he shall inquire whether the person or persons owning any lands and tenements necessary to be used by the said president and directors, or which shall be injured in establishing the said canals and navigation, which person or persons shall be named, and which lands and tenements shall be described in such writ or writs which will suffer and sustain any and what damages, by reason or means of taking any lands, tenements, mill, mill-pond, water, water-course, or other real hereditaments necessary for the use of the said canals and navigation, and the works and locks thereto belonging, and to return the same writ, together with the finding of the said jury, to the court of chancery of this State without delay after such finding; and upon such writ being delivered to the said sheriff, he shall give at least fourteen days' notice in writing to all and every of the owners and occupants of the premises who shall be within his bailiwic, and shall also affix a copy of such notice on the door of the court house or jail within his bailiwic, and if there is no court house or jail, then on the door of some noted tavern within the same, of the lands and tenements in the said writ described, of the time of executing the same, and shall cause to come upon the premises at the time appointed twelve good and lawful men of his bailiwic, who shall be selected in such manner as struck juries usually are, to whom he shall administer an oath that they will diligently inquire concerning the matters and things in the said writ specified, and true verdict give according to the best of their skill and judgment, without favor or partiality; and thereupon the said sheriff and inquest shall proceed to view all and every the lands and tenements in such writ specified; and having considered the quantity of land, land covered with water, mills, buildings, or other improvements that shall be necessary to be vested in the said corporations for the purposes aforesaid; and any water-course then existing, the use whereof will be necessary for the purposes aforesaid, they shall cause the same to be minutely and exactly described by metes and bounds, or other particular descriptions, and shall value and appraise the injury and damages, if any, which the owner or owners of the said lands, tenements, mills, water, water-courses, buildings or improvements, will, according to their best skill and judgment, sustain and suffer by means of so much of the said lands and tenements being vested in the said corporations, or by means of such improvements being destroyed or rendered useless, or of less value, or by means of the said corporations being permitted to turn such water to fill their canals and locks, or by means of the said corporations being permitted to enlarge any mill-pond, mill-race, or other water-course, and to use the same as and for part of their said canals and navigation, or by any other means whatsoever, defining and ascertaining as well all such lands and tenements, liberties and privileges, so to be vested in either of the said corporations as the several sums at which the said injuries and damages shall be so assessed; and the said sheriff and jury shall make an inquisition under their hands and seals, distinctly and plainly setting forth all the matters and things aforesaid; and the sheriff shall forthwith return the same, together with the said writ, to the said court of chancery, and thereupon the chancellor shall examine the same, and if the said writ shall appear to have been duly executed, and the return thereof be sufficiently certain to ascertain the lands and tenements, rights, liberties, and privileges intended to be vested in the said corporations, and the several compensations awarded to the owners thereof, then the said court shall enter judgment that the said corporation, paying to the several owners as aforesaid the several sums of money in the said inquisition assessed, or bringing the same into the said court, over and besides the costs of such writs, and of executing and returning the same, shall be entitled to have and to hold to them and their successors and assigns forever, all and every the lands, tenements, rights, liberties, and privileges in the said inquisition described, as fully and effectually as if the same had been granted to them by the respective owners thereof. And if any of the returns so to be made shall not be sufficiently certain for the purposes aforesaid, the said court shall award an inquisition *de novo*.

And be it further enacted by the authority aforesaid, That whenever any or either of the said canals shall cross any public or private road or highway laid out and established according to law, or shall divide the grounds of any persons so as to require a ford or bridge to cross the same, the jury who shall inquire of the damages to be sustained in manner herein directed, shall find and ascertain whether a passage across the same shall be admitted and maintained by a ford or by a bridge, and on such finding the president and directors of the corporation to whom such canal shall belong shall cause a ford to be rendered passable, or a bridge fit for the passage of carts and wagons, to be built, and for ever thereafter maintained and kept in repair at all and every of the places so ascertained by the said jury at the cost and charges of such corporation; but nothing herein contained shall prevent any person from erecting and keeping in repair any ford or bridge across either of the said canals at his own expense, where the same shall pass his ground: *Provided*, such bridge shall be of such height above the water as shall be usual in the bridges erected by the corporations to whom such canals belong: *And provided also*, That such ford or bridges so to be erected by the owners of such land shall not interfere with any of the locks, buildings, or other works of the said corporation.

And be it further enacted by the authority aforesaid, That the president and directors of each of the said corporations shall have power and authority from time to time to fix the several sums of money which shall be paid by the subscribers or holders of every share of the stock of the said corporations respectively, in part of the sum subscribed, and the time when each and every of the dividends or parts thereof shall be paid, and the place where they shall be received, and shall give at least thirty days notice in two of the public newspapers, one of which notices to be published in the city of New York, in the newspaper printed by the printer to this State, and the other in the city of Albany, of the sum or dividend and the time and place of receiving the same, and if any stockholder shall neglect to pay such proportions at the place or places aforesaid for the space of thirty days after the time so ap-

pointed for paying the same, every such stockholder shall, in addition to the dividend so called for, pay after the rate of seven per cent. for every month's delay of such payment, and if the same and the additional per centage shall not be paid within one year after the same ought to have been paid, then and in such case the share or shares on which such payment shall be due, shall be forfeited to the use of the stockholders of the corporation of which such defaulting stockholder is a member, and may and shall be sold by the said corporation to any person or persons willing to purchase for such prices as can be obtained therefor.

And be it further enacted by the authority aforesaid, That it shall and may be lawful to and for the president and directors of each of the said corporations respectively, and their superintendents, engineers, artists, workmen, and laborers, with carts, wagons, and other carriages, with their beasts of draught and burden, and all necessary tools and implements, to enter upon the lands, contiguous or near to the tracts of the intended canals and navigation, first giving notice of their intentions to the owners thereof, and doing as little damage thereto as possible, and repairing any breaches they may make in the enclosures thereof, and making amends for any damages that may be sustained by the owners of such ground by appraisement in manner hereinafter directed, and upon a reasonable agreement with the owners if they can agree, or if they cannot agree, then upon an appraisement to be made upon the oath of three, or, if they disagree, any two indifferent freeholders to be mutually chosen, or if the owners neglect or refuse to join in the choice, to be appointed by any justice of the peace of the county, and, on tender of the appraised value, to carry away any timber, stone, gravel, sand, or earth, there being most conveniently situate for making or repairing the said canals and navigation, and to use the same in carrying on the said works.

And be it further enacted by the authority aforesaid, That it shall and may be lawful to and for the said president and directors of each of the said corporations, as soon as the said canals and navigation, or any part of either of them shall be perfected, to appoint such and so many collectors of toll for the passage of boats and vessels in, through, and along, the same, and in such places as they shall think proper; and that it shall and may be lawful, to and for such toll collectors and their deputies, to demand and receive of and from the persons having the charge of all boats and vessels, and rafts of timber, boards, plank, or scantling, passing through the said canals and navigation, and the locks thereto belonging, such toll and rates for every ton weight of the ascertained burden of the said boats and vessels, and for every hundred feet, cubic measure, of timber, and one thousand feet, board measure, of boards, plank, or scantling, in rafts, as the said president and directors of each corporation shall think proper at any lock or other convenient place: *Provided*, That the amount of all the tolls accruing to the corporations hereby made and created, by the name of the President, Directors, and Company of the Western Inland Lock Navigation in the State of New York, and arising from the use of the said navigation, wherever the same may be between the navigable waters of Hudson river, and Seneca lake, and Lake Ontario, shall not exceed, in the whole, the sum of $25 for every ton of the burden of such boat or vessel, and so in proportion for every hundred feet, cubic measure, of timber, and one thousand feet, board measure, of boards, plank, or scantling, and so in proportion for any smaller distance and less number of locks in any interval between the said river and lake: *And also provided*, That the amount of all the tolls accruing to the corporation hereby made and created, by the name of the President, Directors, and Company of the Northern Inland Lock Navigation in the State of New York, and arising from the use of the said navigation, wherever the same may be between the navigable waters of Hudson river and Lake Champlain, shall not exceed, in the whole, the sum of $20 for every ton of the burden of such boat or vessel, and so in proportion for every hundred feet, cubic measure, of boards, plank, or scantling, and so in proportion for every smaller distance, and less number of locks in any interval between the town of Troy and near the said river and the said lake; *Provided, always*, That all boats, of a burden less than a ton and using either of the said canals, shall pay the toll for a ton. And in order to ascertain the tonnage of boats using the said canals and navigation, and to prevent disputes between the supercargoes and the collectors of tolls concerning the same—

Be it further enacted by the authority aforesaid, That, upon the request of the owner or supercargo of such boat or raft, or of the collector of the said tolls at any lock upon either of the said canals and navigation, it shall and may be lawful for each of them to choose one person to measure and ascertain the number of tons which the said boat or vessel is capable of carrying, and to mark the same in figures upon the head and stern of the said boat in colors mixed with oil, and that the said boat or vessel so measured and marked, shall always be permitted to pass through the said canals and locks, for which it shall be so marked, for the price per ton to which the number of tons so marked on her shall amount unto, agreeably to the rates fixed in the manner aforesaid, and if the owner or commander, or supercargo, of such boat or vessel, shall decline choosing a person, resident within four miles of the place where such toll is payable, to ascertain the tonnage thereof, then the amount of such tonnage shall be fixed and ascertained by a person to be appointed for that purpose by the collector of tolls at the lock where the toll is payable as aforesaid, and the said toll shall be paid according to such measurement before any such boat or vessel shall be permitted to pass the lock or place where such toll shall be made payable.

And be it further enacted by the authority aforesaid, That if any person or persons, whatsoever, shall wilfully or knowingly do any act or thing whatsoever, whereby the said navigation, or any lock, gate, engine, machine, or device, thereto belonging shall be injured or damaged, he or they so offending shall forfeit and pay to the corporation, to which the injury is done, fourfold the costs and damages by them sustained, by means of such known and wilful act, together with costs of suits in that behalf expended, to be recovered by action of debt in any court having jurisdiction competent to the sum due.

And be it further enacted by the authority aforesaid, That the collectors of toll, duly appointed and authorized by the president and directors of either of the said corporations, may stop and detain all boats and vessels using the canals and navigation to which they respectively belong, until the owner, or commander, or supercargo, of the same shall pay the toll so as aforesaid fixed, or may distrain part of the cargo therein contained, sufficient, by the appraisement of two credible persons, to satisfy the same, which distress shall be kept by the collector of the tolls taking the same, for the space of eight days, and afterwards be sold by public vendue at the most public place in the neighborhood, to the highest bidder, in the same manner and form as goods distrained for rent are by law sold, rendering the surplus on demand, if any there be, after the payment of the said toll and the costs of distress and sale, to the owner or owners thereof.

And be it further enacted by the authority aforesaid, That the President and Directors of the said corporations respectively, may demand and require of and from their treasurers, and of and from all and every of the superintendents, officers, and other persons by them employed, bonds, in sufficient penalties, and with such sureties as they shall, by their rules, orders, and regulations, require, for the faithful discharge of the several duties and trusts to them, or any or either of them respectively committed.

And be it further enacted by the authority aforesaid, That the president and directors of each of the said corporations shall keep just and fair accounts of all moneys received by them from the subscribers to the said undertaking for their subscription thereto, and all penalties for delay or non-payment thereof, and of all moneys by them expended in the payment of the costs and charges of procuring and purchasing all estates, rights, and titles in

the said corporations, respectively, to be vested in pursuance of this act, or by any other means, and in paying their several officers by them to be appointed, and the wages of the different engineers, artists, workmen, and laborers by them to be employed, and for the materials and work furnished and done in the prosecution of the works projected by the said corporations, respectively, and each of them shall, once at least every year, submit such account to the general meeting of the stockholders, until the said canals and rivers therewith connected shall be rendered navigable, and until all the costs, charges, and expenses of effecting the same shall be fully paid and discharged, and the aggregate amount of such expenses shall be liquidated; and from and after the liquidation thereof, if the one thousand shares above mentioned for each or either of the said corporations shall not be sufficient, it shall and may be lawful to and for the said president and directors of the said corporations, respectively, at the general meeting of the stockholders, held in pursuance of the preceding provisions, or called by the president and directors for the special purpose, by public notice in two newspapers, in manner aforesaid, (which shall be given three months previous to the opening of the said subscriptions,) to increase the number of shares to such extent as shall be deemed sufficient to accomplish the objects of this act, and to demand and receive such additional subscriptions from the former, or, in case of their neglect or refusal, from new subscribers, and upon such terms, and in such manner, as by the said general meeting or meetings shall be agreed upon; and the said president and directors of the said corporations, respectively, shall also keep just and true accounts of all and every the moneys received by their several and respective collectors of toll in and through the said canals and navigation, and shall make and declare a dividend of the clear profits and income (all contingent costs and charges being first deducted) among all the stockholders of the stock of the said several corporations, and shall, on every the second Mondays in June and December in every year, publish, in manner aforesaid, the half yearly dividend to be made of the said clear profits to and amongst their stockholders, respectively, and of the times and places when and where the same shall be paid, and shall cause the same to be paid accordingly.

And be it further enacted by the authority aforesaid, That, at the end of ten years after the said navigations, respectively, shall be completed, the corporations, respectively, shall render an abstract of the accounts to the Legislature for the last three years of the said ten; and if it shall then appear that the clear profits and income will bear a dividend of any rate on the principal sum expended exceeding ten and not exceeding twenty-five per cent., each of the said companies shall continue the tolls on which such dividend has arisen for such a term of years as to produce to them, respectively, an interest at the rate of ten per centum per annum on the principal sum of their expenditures, such interest being computed on the several payments of the principal from the time and times they were respectively made until it shall be produced as abovesaid, after which the tolls shall be so reduced as to divide a clear profit not exceeding fifteen per cent.; and if such dividend shall exceed fifteen per cent., the excess shall be paid into the treasury of this State; and from and after the time and times when the said companies, respectively, shall render an abstract of their accounts as aforesaid, they shall, once at least in every three years, render to the Legislature an account of the tolls they may have collected, and the sums expended during the years next preceding, so that the clear profits of the companies, respectively, may in any year be known to the Legislature.

And whereas any unnecessary delay in prosecuting the object for which the said corporations have been made and created will be detrimental to the community, therefore,

Be it further enacted by the authority aforesaid, That, if the corporation hereby made and created, by the name of the President, Directors, and Company of the Western Inland Lock Navigation, in the State of New York, shall not, within the term of five years, to be computed from the first day of January next, complete so much of the said navigation as is between the south bounds of the town of Schenectady and the waters of Wood creek, in such manner as that boats drawing, when loaded, two feet of water, and of the length of forty feet, and of the breadth of twenty feet, may ascend and descend the Mohawk river, in every part of the said river between the town of Schenectady and the waters of Wood creek, that then, and in such case, this act, so far forth as relates to the said corporation, shall cease and become null and void, and all the rights hereby vested in the said corporation shall revert to the people of this State, any thing herein contained to the contrary notwithstanding; and if, within the term of fifteen years, to be computed from the said first day of January next, the said navigation shall not be continued down the said Wood creek, and extended to Lake Ontario and to the Seneca lake, to carry boats of the burden above mentioned, then it shall be the duty of the attorney general of the State for the time being, *ex officio*, to file an information in the supreme court of this State against the said corporation; and if, upon the traverse, it shall be found that the said corporation hath not extended the said navigation, in manner aforesaid, down the said Wood creek, and as far as to the Seneca lake and Lake Ontario, and judgment shall be given in favor of the people of this State, thenceforth the powers and rights vested in the said corporation, so far forth as relates to the extension of the said navigation from the said Wood creek to the said lakes, shall cease, determine, and be null and void, any thing in this act to the contrary hereof notwithstanding.

And be it further enacted by the authority aforesaid, That, if the corporation by this act made and created, by the name of the President, Directors, and Company of the Northern Inland Lock Navigation, in the State of New York, shall not, within the term of fifteen years, to be computed from the first day of January next, complete the said navigation from a west line from the mouth of the creek on which the mill now in the possession of John Van Rensselaer stands, in the town of Troy, to that part of the said town opposite to the north end of the house in the occupation of George Tibbets, so that vessels drawing four feet of water may pass at low water, when loaded, and shall not complete the navigation of Hudson river from the point opposite to the said house in the occupation of the said George Tibbets to a point in Hudson river where a canal from Wood creek or any branch thereof, shall intersect the said river, to carry boats of the burden and dimensions specified in the last preceding section of this act, and shall not in like manner complete such canal and the navigation from Hudson river to Lake Champlain, that then, and in either of these cases, this act, so far forth as relates to the said corporation last mentioned, shall cease and become null and void, and all the rights by this act vested in the said corporation shall revert to the people of this State, any thing herein contained to the contrary hereof notwithstanding: *Provided always*, That it shall be first found, by information, traverse, and judgment, in manner aforesaid, that the said navigation has not been so completed.

And for the encouragement of the said corporations, respectively, and to enable them to prosecute the objects for which they were respectively instituted, with the greater despatch and efficiency—

Be it further enacted by the authority aforesaid, That it shall and may be lawful to and for the treasurer of this State, for the time being, and he is hereby required, whenever it shall be certified unto him by the person administering the Government of this State for the time being, that it has appeared to him, by satisfactory proof, that either of the said corporations hath actually expended and laid out in the prosecution of the said inland navigation the sum of $25,000, to pay unto the president and directors of each of the corporations, respectively, (for the use of the stockholders thereof, as a free gift to them from the people of this State,) in whose favor such certificate shall pass, the sum of $12,500 out of any moneys which may come into the treasury after the first day of October next: *Provided always*, That when such payment shall be made to the said corporations, or either of them, they shall pro-

ceed in the objects of their institution until the said free gift shall be expended or laid out thereon; and, in failure thereof, the same shall be repaid into the treasury; any thing in this act to the contrary notwithstanding.

And be it further enacted by the authority aforesaid, That as soon as the said companies shall respectively be incorporated as aforesaid, the said commissioners shall, upon demand, pay to the president and directors of each of the said corporations the several sums by them received, on taking the said subscriptions to the said companies respectively, and by them retained as aforesaid, for the use of the said corporations respectively, to which the same shall be subscribed, after deducting thereon such contingent charges as they shall have incurred in the execution of the trusts committed to them by this act.

AN ACT to amend an act, entitled "An act for establishing and opening lock navigation within this State," passed December 22, 1792.

Whereas the president and directors of the company incorporated by the name and style of "The President, Directors, and Company of the Western Inland Lock Navigation in the State of New York," and the president and directors of the company incorporated by the name and style of "The President, Directors, and Company of the Northern Inland Lock Navigation, in the State of New York," have, respectively, in behalf of the stockholders in the said companies, represented to the Legislature that, by reason of sundry of the provisions, restrictions, and limitations contained in the act, entitled "An act for establishing and opening lock navigations within this State," passed the 30th day of March, 1792, the progress of the improvements to the internal navigation for which the said companies were incorporated will be greatly retarded, if not entirely arrested, unless further legislative interference shall be interposed. To the end, therefore, that improvements, whose object is extensive benefit to the community, may not be impeded, and to render the advantages which are contemplated to result therefrom as mutual between the citizens at large and the said companies respectively, as the nature of the case will admit—

Be it enacted by the people of the State of New York, represented in Senate and Assembly, and it is hereby enacted by the authority of the same, That it shall and may be lawful for the president and directors of the said corporations and their successors severally and respectively, to construct any and every canal and lock which they may deem necessary to make of any breadth at their option, provided that every such canal and lock shall not be less than ten feet broad at the bottom or base, nor any lock less than seventy feet long between the gates thereof, any thing in the said act to the contrary hereof notwithstanding.

And be it further enacted by the authority aforesaid, That if, in the greater part of the time between the first day of March and the first day of December in every year, the water in the canal and locks to be constructed by the said presidents and directors, or by their successors respectively, and the water in the creeks and rivers into or through which vessels shall pass, to and from any such canal or lock, shall be of such depth as that vessels drawing two feet of water when laden can pass through, the incorporations aforesaid shall not cease, become void, and forfeited, if in the residue of the period aforesaid there shall not be a sufficiency of water to permit vessels drawing two feet of water to pass through such canals, locks, creeks, or rivers, any thing in the said act to the contrary notwithstanding.

And whereas, by the seventh section of the said act, it is enacted, that the said corporation, previous to their respectively entering upon any lands with intent to appropriate the same, the improvements for which the said incorporations were erected, shall purchase such land, or shall cause the same to be appraised in manner directed by the said seventh section. And whereas, before such appraisement can be obtained, much injury may be sustained by the said corporations, and the improvements by them intended arrested, to the detriment as well of the community as of the said corporations; for remedy whereof—

Be it further enacted by the authority aforesaid, That it shall and may be lawful to and for each of the said corporations, by its president and directors, or by any superintendent, agent, or engineer, appointed under the seal of the said corporations respectively, to enter into and upon all and singular any land or lands, whether covered with water or not, which they, or either of them may deem necessary for the prosecution of the improvements aforesaid, or whereon or whereby to construct any canal, lock, dike, embankment, pond, dam, or other work intended or permitted by the said act, and by this act to be so constructed, and that without the leave and permission of the owner or owners, proprietor or proprietors of such land first had and obtained, and, having so entered, to dig, trench, and use the said lands for the purposes aforesaid, together with one hundred feet more of such land on each side of any canal, lock, dike, embankment, pond, dam, or other device relative to the said improvements, and to appropriate the same land to such uses as the said corporations respectively shall seem proper; any thing in the said act to the contrary hereof in any wise notwithstanding: *Provided, nevertheless*, that in every case where such entry shall be made, and occupancy had as beforesaid, on the part of the said corporations, or either of them other than by and with the consent of the owner or owners, proprietor or proprietors of such land, it shall be, and is hereby made the duty of the president and directors of the said companies severally, within forty days next after such entry has been made, on the part of either of them to solicit an appraisement of the property so taken, and of the damages sustained by the party or parties from whom the same was taken, in manner directed by the said seventh section; and, in default of obtaining such writ as in the said seventh section is directed, within the said forty days, the party or parties aggrieved shall be entitled to fourfold the amount of the damages sustained by such entry, taking and occupying, to be recovered in any court of record, having cognizance thereof, with costs of suit: *Provided*, That the powers hereby granted to the said corporations of making entries into lands, shall not continue beyond the completion of the said canals, or if not completed in the mean time beyond the period limited by the former act for completing the same; saving also, to the proprietors of any lands that shall be contained within the one hundred feet aforesaid, the right of a way or ways to pass to and from his, her, or their land, as is provided in and by the eighth section of the act hereby amended. And, for the further encouragement of the said corporations to prosecute the objects of their institution,

Be it further enacted by the authority aforesaid, That it shall and may be lawful to and for each of the said corporations, at all times hereafter, and at any place where they shall have constructed a canal, lock, embankment, dike, pond, dam, or other improvement, to take and make use of the water contained therein, or in either of them either for mills or any other hydraulic works, which the said corporations respectively may erect or cause to be erected, or to let the use of such water to any person whomsoever, for the use of mills or other hydraulic works, or for irrigating any lands, or for supplying bleach grounds, tanpits, brick-yards, or to any other purpose to which such water is capable of being applied, and the neat profits or rents, resulting therefrom, to distribute amongst the stockholders, in proportion to their respective shares, as a free gift from the people of this State, exclusive of and over and above the per centage which the said companies are, by the said act, permitted to divide, as arising from the toll mentioned in the said act: *Provided always*, That no such use shall be made of the water running through or standing in any canal, lock, river, or creek, if the canal, lock, creek, or river, at the place where such water

shall be taken therefrom, shall, by such use, be rendered incapable of carrying vessels drawing two feet of water when laden: *And provided further*, That the moneys which may be laid out or expended by either of the said companies on any special works which they may erect by virtue of this clause, shall not be considered as any part of the principal sum expended, on which the said companies are allowed, by the act hereby amended, to compute the interest which may be taken by them respectively.

And be it further enacted by the authority aforesaid, That all the land under the water in the Mohawk river may be occupied by the corporation first above mentioned, for the purpose of constructing any canal, lock, dike, embankment, or dam, for the improvement of the navigation thereof, shall be, and is hereby, vested in the said corporation and its successors, for and during the existence of the said corporation, and no longer; and for the purposes aforesaid, as a free gift from the people of this State; saving and reserving to the people of this State the right to all lands under the water not so occupied as aforesaid, to be appropriated as the Legislature shall, from to time, direct. And that all the lands under the water in Hudson river, which may in like manner be occupied by the said corporation last mentioned in the preamble to the first section of this act, shall in like manner be vested in the said corporation and its successors, and for the like purposes, and under the like saving and reservation, as a free gift from the people of this State:

Provided always, and be it enacted further by the authority aforesaid, That no dam or dams shall be erected in Hudson river, other than where a canal shall run from the water raised by such dam, to communicate with the water below the water now navigable, or to be rendered navigable by the said company; and such dams shall not be higher than is necessary for the works with which they are connected; and that nothing in this act shall be construed to prevent any person or persons from passing over such dam or dams with rafts of timber, boards, or other lumber, when the water running over such dam or dams shall be of sufficient depths for the passage of such rafts without injuring the dam or dams, and that without paying any toll for such passage: *And provided also*, That, in every such dam across the said river, a flood-gate, sluice, or other proper device, shall be constructed to admit the passage of fish ascending the said river, and to be constantly kept open, except in winter, when, for the greater safety of the dam, gate, sluice, or other device, the same may be closed: *And provided also*, That, in every dam to be erected across the said rivers Hudson or Mohawk, a flood-gate, sluice, or other proper device shall be constructed to admit the passage of fish ascending the said rivers: *And provided also*, That no net, seine, fuyck, or other contrivance for taking fish, or preventing their ascending the said rivers, shall be used or placed, by any person or persons whomsoever, within the distance of five hundred yards of such sluice, gate, or other device as aforesaid, under the penalty of ten pounds for every such offence, to be recovered with costs of suit, before any justice of the peace, by any person or persons who shall prosecute for the same, one-half whereof shall be for the use of the poor of the town where such offence shall be committed, and the other half to and for the use of the person or persons who shall prosecute for the same.

And whereas, by the eleventh section of the said act it is enacted that the tolls on vessels passing through the said improved navigation shall be computed according to the tonnage of such vessels, and that the toll on timber, boards, plank, and scantling, shall be estimated in proportion to the toll on the tonnage of such vessels, by means whereof as much toll may be exacted from vessels passing empty as from those full laden: for remedy whereof—

Be it further enacted by the authority aforesaid, That it shall be optional with each and either of the said corporations, respectively, to make such discrimination in the toll to be demanded for empty or laden vessels as they shall think proper; and that it shall be further in their discretion, respectively, to estimate and establish the toll to be taken passing any lock or other improvement, either according to the tonnage of vessels or rafts, passing through or by the same, or by charging a specific toll on every particular article transported through such canal, lock, or other improvement of the said navigation: *Provided always*, That the aggregate toll on any particular articles shall not exceed, upon a ton weight of such articles, the sum which the said corporations are respectively permitted to charge and take by the said eleventh section, any thing in the said act to the contrary hereof notwithstanding.

And be it further enacted by the authority aforesaid, That the annual election for directors, in each of the said corporations respectively, in manner prescribed by the said act, shall henceforth be held on the second Tuesday in January in every year, and that the first election for directors shall be held on the second Tuesday in January next ensuing the passing of this act.

And be it further enacted by the authority aforesaid, That no *non-user* or *mis-user* heretofore omitted, neglected, or done, or which may hereafter, and before the second Tuesday of January next ensuing the passing of this act, be neglected, omitted, or done, shall operate so as to defeat or work an injury to either of the said corporations, any thing in the said act to the contrary notwithstanding.

And be it further enacted by the authority aforesaid, That the stock, interest, and shares of and in the said several corporations shall be deemed and considered as personal property to all intents and purposes whatsoever.

AN ACT further to amend the law relative to lock navigation within this State. Passed the 9th of March, 1793.

Whereas petitions have been presented to the Legislature praying for sundry amendments to the act, entitled "An act to amend an act, entitled An act for the establishing and opening lock navigations within this State."

And whereas the President of the Board of Directors of the Western and Northern Inland Lock Navigation Companies, in their behalf, has signified to the Legislature that, in his opinion, the alterations hereinafter specified may be made without materially injuring the important object for which the said companies were instituted: Therefore,

Be it enacted by the people of the State of New York, represented in Senate and Assembly, That the president and directors of the said companies shall not take and occupy a greater extent of land, on each side of any canal, dike, or other work incident to the object for which they were incorporated, than twenty feet beyond such work, except where any lock shall be placed, in which case they may take and occupy to the distance of one hundred feet from the side of such lock, for the whole length of such lock, and for the distance of one hundred feet above and below such lock, if, in their discretion, they shall deem that extent requisite; and also, except where a bridge is to be placed over any canal, in which case they may take and occupy one hundred feet from such canal, and for a space as wide as such bridge, if, in their discretion, they shall deem such extent requisite.

And be it further enacted, That in all cases where it shall be requisite to appropriate any lands on which there may be any house or houses, or other buildings, or to appropriate any lands which shall reach to, or approach to or within fifty feet of any house or other building which shall then be erected on a part of the land so to be appropriated by the said company, the President or an agent of such company shall give thirty days' notice to the owner or owners, occupant or occupants thereof, before the president and directors of such company, or any or either of their agents, shall take, use, or occupy such land, any thing in this or any other law to the contrary notwithstanding.

And be it further enacted, That, in every dam that shall be constructed in the river Hudson by the said company, an aperture shall be so constructed as that not only rafts may descend with facility and safety, but that fish may ascend the river there, through or thereon; and that no toll shall be taken for the passage of such rafts, nor any contrivance for the taking fish by nets, or otherwise, shall be placed at such aperture by the said president and directors, or by any other person whomsoever, to impede or take fish at such aperture, or within five hundred yards above or below such aperture.

Provided always, That it shall be optional with the president and directors of the said company to permit the passage of rafts or not, as they shall deem proper, through any canal, lock, or other work, to be erected or made, in or by the river Hudson as aforesaid, other than through or over any dam in the said river; and, if such permission shall be granted, the party giving and the party requiring the same shall agree upon the quantum of toll for such raft, without any regard to the limitation of toll stipulated in the original act, by which the said company was incorporated.

B. 3.

SIR: NEW YORK, *January* 19, 1808.

In answer to your several queries respecting the proposed canal at or near Niagara, I find, on examining the survey and estimates made by an eminent engineer, at great length and much apparent accuracy, that the height of water at the commencement of the canal, above that at the termination, was three hundred and twenty-five feet; the water to be taken out of the Niagara river at Fort Schlosser; the canal to terminate at a place on the same river known by the name of the Devil's Hole; the distance between these two points one thousand two hundred and seventy-two perches, or about four miles; the ground clayey, or shelly rock; the station first mentioned is about sixteen miles below the outlet of Lake Erie which forms the Niagara river, by which name the waters between Lakes Erie and Ontario are known; the waters of the former are about four hundred and fifty feet above those of the latter; this difference in height arises from the rapid waters both above and below the two stations mentioned as the beginning and end of the canal; the calculation (as to expense) was for smaller navigation than sloops, and amounted to about 437,000 dollars. The estimates, maps, and remarks on this subject are still in the hands of Mrs. Watson, and, should they be wanted for public use, may be purchased at a less sum than the same could now be made.

Wishing success to so laudable a measure as opening this intercourse, I am, sir, with great respect,

Your obedient humble servant,

DANIEL PENFIELD.

TO SAMUEL OSGOOD, Esq.

No. 1.

1st. Elevation of water in Lake Erie, above the lower end of the canal, in Niagara river or Lake Ontario.

2d. The place where the canal was intended to be taken out from Lake Erie, and of that where it was to end, whether in Niagara river or Lake Ontario.

3d. The distance between those points or length of the canal.

4th. The water which was to feed the canal, whether Lake Erie itself or a creek emptying into it.

ERIE.

The canal was to begin at Fort Schlosser, and to end at the Devil's Hole. Its length was about one thousand two hundred and seventy-two perches, or about four miles; the ground clayey, or shelly rock. It was to be supplied with water from Lake Erie and Giles's creek. The height of water in Lake Erie above Lake Ontario about four hundred and fifty feet.

C. No. 1.

CANAL BETWEEN SANTEE AND COOPER RIVERS.

SIR: COLLECTOR'S OFFICE, CHARLESTON, *September* 26, 1807.

Agreeably to your instructions of the 28th of July last, on the subject of canals, I have waited on Doctor Ramsay, Judge Grimke, and Mr. William Loughton Smith, which gentlemen are principal stockholders or directors of the canals of this State, requesting their aid in order to accomplish the wishes of the treasury, which they readily complied with, and enclosed are the answers to the several questions, with their opinion relating thereto.

With regard to turnpike roads, there are none in this State; the Legislature have, however, appointed several gentlemen to investigate the subject, and report at their next session.

I have the honor to be, sir, your obedient servant,

SIMEON THEUS.

Questions proposed by the Secretary of the Treasury respecting canals, and answers to the same, with respect to the canal between Santee and Cooper rivers in South Carolina.

Question 1st. Points united by canal, and their distance by said canal?

Answer 1st. Santee river, and the head waters of Cooper river, about twenty-two miles from each other.

Question 2d. Elevation of highest ground through which canal passes, descent thence to the two lowest extremities, and number of miles where canal is level?

Answer 2d. The elevation of the highest ground is about fifty-two feet; this has been reduced by digging to about thirty-five feet. The summit is about three and a half miles from Santee river; thence, the canal runs about five miles on a level: from each end of this level, it descends, on the north side to the Santee, and on the south side to Cooper river.

Question 3d. Number, dimensions, contents, construction and situation of locks.

Answer 3d. Eleven locks, two double and nine single; they are sixty feet in length between the gates, and ten feet wide, calculated to pass boats fifty-four feet long, and nine and a half wide; they are entirely of brick, except in the vicinity of the gates. These are faced with hard stones, (chiefly Philadelphia marble.) There are three locks in the first two and a half miles; say one single lock of six feet rise at the beginning of the canal or Santee river; another single lock of ten feet rise at the distance of half a mile, and a double lock of nineteen feet rise at the distance of two miles, and at the beginning of the summit. From the south end of the summit to Cooper river, there is one double and seven single locks, making, in the whole, sixty-eight feet fall.

Question 4th. Supply of water, whence obtained, its amount reduced to cubic feet per minute, hour, or day; its elevation above the highest point of the canal, length of feeders, situation and contents of reservoirs, what additional resources may be resorted to if the present supply should fall short of the quantity wanted?

Answer 4th. The water is supplied partly from the bottom of the canal, which, in the low flat country of South Carolina, on the sea-coast, generally springs at the depth of from six to ten feet from the surface, and partly from springs in the bottom of the summit canal, which, being dug from ten to fifteen feet below the surface, afford a considerable supply, and partly from swamps and springs in the vicinity, which are banked in for the purpose of reservoirs; there are two on the summit or highest part of the canal; the first is a swamp called Kirk swamp, through which the canal runs. This is a mile and a quarter long, and a mile wide, and contains from three to four feet water. The soil is of a stiff clay, well calculated to contain water. The next is a swamp called Bulltown swamp, which is connected by means of drains with several others in the vicinity, for a distance of about four miles, and from a quarter to half a mile wide, containing nearly as much water as Kirk swamp. The soil is not quite so good to contain water, as part of the land flowed is high land. These last mentioned swamps are part of the head waters of Biggin swamp. There are several other reservoirs of less magnitude below the summit canal; these can only be conveyed into the canal below or on the south side of the summit, about five miles to the north of the junction of the canal with Biggin creek, which is one of the heads of Cooper river; at the plantation of Stephen Mazyck, Esq. is a very large spring which is conveyed into the canal, and is a never failing resource for that part of it. The elevation of the reservoirs above the level of the canal is from three to six feet. The amount of water furnished to the canal has never been calculated; it varies with the weather, but there is seldom a deficiency; in that case, it has been contemplated to elevate water by steam machinery from the Santee river, and to conduct it to the most elevated ground between the two rivers, which is within four miles of the Santee.

Question 5th. Designation of such parts of the route where the natural or improved bed of rivers is used?

Answer 5th. The canal runs across from one river to the other, and of course no part of it coincides with the bed of either river. For about fifteen miles on the southern extreme of the canal, it runs nearly parallel with Biggin swamp, but does not coincide with its channel till it terminates therein as one of the heads of Cooper river. (See a plan of the canal in Drayton's view of South Carolina.)

Question 6th. Depth and breadth of the canal; burden of vessels; breadth of towing paths?

Answer 6th. The canal is thirty-five feet wide at top, but sloping down at each side to a width of twenty feet at bottom, and is calculated to contain water to the depth of four feet, and to pass boats of 22 tons. The towing paths on each side are about ten feet wide.

Question 7th. Aqueducts across valleys or rivers; tunnels through hills; bridges across the canal?

Answer 7th. Several streams across the canal. These are partly taken into the canal; but most of them are conveyed underneath it by means of aqueducts, on account of their being too low for admission into the canal; one is partly thrown over it by means of a tumbling dam. There are no hills to create a necessity for tunnels; there is a bridge over every lock, besides five large bridges over the canal where it crossed either a public road or private ones to plantations for the convenience of the inhabitants; also a number of smaller ones over drains from the reservoirs. There are, in the whole, about thirty bridges of different dimensions at and appertaining to the canal.

Question 8th. Particular obstructions and difficulties surmounted, or to be encountered?

Answer 8th. The obstructions which existed have been surmounted; these were chiefly from the roots of trees; there were no stones in the way; the face of the country being nearly level, and the soil being chiefly sandy or marshy, little else was required but labor to remove earth and trees.

Question 9th. Defects either in the plan or execution, and the proposed remedies?

Answer 9th. The principal defect hitherto charged on the canal is, the smallness of its locks; if they were larger, wood might more conveniently pass through, and large boats, which now occasionally pass down Santee river to the ocean, might come to Charleston without the risk to which they are exposed in going round. The only remedy is to take down the locks and rebuild them on a larger plan. To this there are several objections; but the probable deficiency of the water in dry seasons is the principal one. The western settlers, who are the great supporters of the canal, are satisfied with the present locks, for they are sufficiently large to admit any boat that can descend the shallow rivers adjacent to their settlements.

Question 10th. Estimate of the tonnage of vessels; species, weight, and value of the articles annually conveyed by the canal; expense of carriage by canal compared with land or river carriage before canal was made; time employed in navigating through the canal?

Answer 10th. No estimate has been made of the general tonnage of the boats using the canal, nor of the weight or value of the articles conveyed by them, for the toll is regulated solely by the size of the boats. Cotton is the principal article that passes. The expenses of water carriage down the rivers and through the canal are generally about one-half of the expenses of conveying the same articles by land from the place of their growth to the Charleston market. The difference is not so great between the expenses of a conveyance in canal boats through the canal and in large river boats by the mouth of Santee river; but in the latter case, the danger of total loss is considerable, the period of a trip doubled, and the conveyance cannot be effected at all unless the river is high from recent rains or freshets; whereas canal boats can pass at all times, and, for the most part, through from river to river either way in a day.

Question 11th. Capital already expended, vested, or wanted for completing the work?

Answer 11th. Six hundred and fifty thousand six hundred and sixty-seven dollars have been already expended; the canal is finished, and has been in use about six years. Sixty negroes and several adjacent tracts of lands have been purchased by the company.

Question 12th. Expenses per mile, and in the whole, and, as far as practicable, of every component part of the work in all its details?

Answer 12th. From twenty to thirty thousand dollars per mile. The expenses were chiefly materials and masonry for the locks, and hire of negroes for digging and removing earth; the expenses of the latter varied with the level and the qualities of the soil; in the highest ground, earth was removed to the depth of sixteen feet from the surface; in the lowest, the bottom of the canal was occasionally raised from five to six feet above the surface; the bricks employed in the locks were mostly made on the spot by the company; what were bought cost the company about ten dollars per thousand, and the laying of them about three dollars per thousand.

Question 13th. Rate and gross amount of tolls. Annual expense of repairs and contingencies. Annual nett income?

Answer 13th. The rates are as follows, viz:

For boats and flats not exeeeding 6½ feet breadth,	$10 00
For boats and flats exceeding 6½ and not exceeding 7½ feet breadth,	15 00
For boats and flats exceeding 7½ and not exceeding 8½ feet breadth,	20 00

For boats and flats exceeding 8½ and not exceeding 9½ feet breadth,	$25 00
Flats exceeding 8½ and not exceeding 9½, and not having more than 70 bales cotton,	30 00
Flats exceeding 8½ and not exceeding 9½, and having more than 70 bales cotton,	35 00
Flats exceeding 8½ and not exceeding 9½, having paid the tolls of 30 or 35 dollars down, shall be passed back, if returning within 30 days, for	20 00

Gross amount of toll.

Total amount for 1802,	$3,083 00
Total amount for 1803,	5,407 00
Total amount for 1804,	6,886 00
Total amount for 1805,	10,563 00
Total amount for 1806,	12,776 00
For the first 7 months of 1807,	11,288 00
Annual standing expenses, about	5,000 00
Annual contingent expenses will, in future, be about	2,000 00
Annual nett income hitherto,	

Question 14th. Substance of charters, and acts of Legislature upon the subject?

Answer 14th. Soon after the peace of 1803, the Legislature of South Carolina incorporated companies for opening the Catawba and Broad rivers, for clearing Edisto, and for connecting that river with the Ashley, and for connecting Santee and Cooper rivers. These several charters may be found in Grimke's collection of laws. All the companies incorporated by them have hitherto failed in accomplishing the object of their incorporation except the last. This has been completed between the years 1792 and 1800, but the stockholders have as yet received no dividend nor return for their expenditures. This has so materially injured them that a canal phobia is universal in South Carolina. The companies, though incorporated for the aforesaid purposes by liberal charters, have given up their respective projects, except the Santee canal company, and the company for opening the navigation of the Catawba and Wateree rivers. The charter to the latter embraces an object of the first importance, and holds out the greatest encouragement to stockholders. Yet with all these advantages, half of the shares are not taken up, and the work languishes for want of support. The sum of forty thousand dollars, either advanced, lent, or laid out in the purchase of vacant shares, would ensure the speedy completion of this most useful work. For it would command the trade of the adjacent States; the Catawba passes through the heart of South Carolina into the mountains of North Carolina, and has been navigated in batteaux from Morgantown in that State, to Charleston, three hundred and fifty miles, through a population of one hundred and seventy thousand persons. The Catawba, Kanhawa, and Tennessee rivers head near each other. The trade of Tennessee, Kentucky, and a great part of the settlements on the Ohio would, of course, come to Charleston if the Catawba was opened. (See the map of South Carolina, North Carolina, and the settlements beyond the mountains.)

There is abundance of iron ore, of the best quality, on the Catawba river, and the South Carolina settlements on the head of it abound in all kinds of provisions and cattle.

The United States arsenal is on this river; but while it is unopened, it will be difficult to supply the works with raw iron from above, and to transport the proceeds from the arsenal to the intermediate country down the river or to Charleston.

DAVID RAMSAY.

Catawba Canal Company in South Carolina.

CHARLESTON, *September* 1, 1804.

The charter granted by the Legislature of South Carolina to the company for opening the Catawba and Wateree rivers, by clearing away the shoals and removing obstructions, may be justly considered as the most valuable ever granted in the United States.

1st. It is in perpetuity, and the shares are forever free from all kinds of duty or tax.

2d. The company are allowed to raise a toll equal to 25 per cent. on the capital expended.

3d. It cedes to the company all the vacant lands lying within two miles of both banks of the rivers Catawba and Wateree, from Camden Ferry to the North Carolina line, a distance of about one hundred miles, so that it comprehends all the vacant lands in four hundred square miles, and which have already been ascertained to comprise not less than forty thousand acres, some worth five dollars, and none less than one half dollar per acre.

4th. It gives the company the exclusive right of a ferry at Rocky Mount, a place which promises to be soon a considerable village, and several valuable mill-seats.

Since the charter was granted, the company have purchased and now hold the village of Rocky Mount, the most elevated, healthy, and beautiful spot in South Carolina, which, with its environs, contains about four hundred acres of land.

The Catawba river flows through an immense tract of country in North and South Carolina, having its source as far up as Bunkum in the former. A company in North Carolina is now actually opening the shoals in that State, and there is no doubt that the river will be made navigable very near to its source; the produce which will be brought down it will be, of course, considerable. Towards Camden, it assumes the name of the Wateree, and flows into the Santee, now navigable to Charleston through the Santee canal and Cooper river. Active operations are carrying on under the direction of the company's engineer,* Mr. Graff, in South Carolina, and it is hoped that the navigation will soon be complete as high up as Rocky Mount, near which the great military arsenal of the United States for the southern department is now constructing.

In less than three years the navigation will be completed quite to the North Carolina line, and as the operations in that State will keep pace with those in South Carolina, it is not doubted that within three years there will be a free navigation, from the vicinity of the source above mentioned, to Charleston.

The total number of shares is twelve hundred. Only about six hundred are taken up.

The actual price of a share is now about one hundred and ten dollars, on which there will be required two semi-annual payments, viz: in March and September, until the whole work is finished; each requisition is about eight dollars, but may, if necessary, be doubled, on a semi-annual previous notice.

* Since the publication of the above, Mr. Graff quitted the company's service, being hypochondriacally inclined, and the company have never been able to obtain any person properly qualified to conduct the work; a Mr. Barnett has lately made proposals for opening the lower part of the river, which General Davie and the rest of the committee have now under consideration.

J. GRIMKE, *President of the Catawba Company.*

C. No. 2.

Rules and By-laws of the Catawba and Wateree Company.

AN ACT to establish a company for the opening of the navigation of the Catawba and Wateree rivers.

MARCH 27, 1787.

Whereas John Rutledge, Thomas Sumpter, William Hill, Daniel Bourdeaux, John Gaillard, Benjamin Waring, Joseph Atkinson, and Theodore Gaillard, have, for themselves and others, by their petition to the General Assembly, represented that the opening of the navigation of the Catawba and Wateree rivers, from the North Carolina line to Camden Ferry, by means of canals, dams, and locks, and clearing the same of the obstructions which are now in the way, will be of great public utility; that the said petitioners have entered into an agreement, for establishing a company for opening the navigation of the said rivers, should they meet the sanction of the Legislature, and prayed to be incorporated by law, under the name or title of "The Company for opening the Navigation of the Catawba and Wateree Rivers," and that they be vested with such powers, privileges, and immunities, for carrying the same into effect, as are granted to the incorporated company for the inland navigation between Santee and Cooper rivers.

1. *Be it therefore enacted*, That the said petitioners, and such others as shall be admitted into the said company, shall be, and they are hereby, incorporated, by the name and title of "The Company for opening the Navigation of the Catawba and Wateree Rivers."

2. The said company, by the name and style aforesaid, shall and may sue, and be sued, implead and be impleaded, in any court within this State; and that they may elect and appoint all necessary officers, and from time to time make such rules, regulations, and by-laws, as they shall think proper for their own government; provided the same shall not be repugnant to, or inconsistent with, any laws of the State.

3. The said company shall and may cause a navigation to be made on the rivers aforesaid, by means of dams, canals, and locks, or in such other manner as to them shall seem most fit and convenient, between Camden Ferry and the North Carolina boundary line, and that they, and their successors forever, shall and may fix and establish, and be entitled to take and receive, by way of toll, for all goods and merchandise carried on or through, and boats, vessels, and rafts, passing on or through the said rivers, within the limits aforesaid, such sums or rates as the company shall think proper to impose, not exceeding at any time twenty-five per cent. per annum on the money they shall have expended in opening and keeping in repair the said navigation, to ascertain which the books of the said company shall always be liable to the inspection of the Legislature; that the said toll shall be payable in the current money of the State; and that the said company, or their agents, may stop any goods, vessels, boats, or rafts, from passing on the said rivers, until payment of the said toll.

4. The said company shall have power to open, and keep open, such road, or roads, on each side of the banks of the said rivers, as they may deem necessary for the use of the navigation aforesaid, and to purchase for themselves and their successors forever, all such lands as may be necessary; and where they and the owners of said land cannot agree for the same, to take the said land on valuation, to be made by a majority of five persons, to be appointed by the court of chancery or common pleas to value the same, which land shall, on payment of the sum at which it shall be so valued, be vested in the company forever.

5. The said company shall be obliged to keep the said navigation in good and sufficient order and condition, on pain of being answerable for any damages occasioned by their wilful default or neglect.

6. The shares in the said company shall be forever exempted from any rate, tax, duty, assessment, or imposition whatsoever, and that the said shares may be sold, transferred, assigned, or bequeathed, by the proprietors respectively, and in case of their dying intestate, shall go as personal estates according to the statute of distributions.

7. If any person shall wilfully or maliciously cut, break down, damage, or destroy, any bank, or other work to be erected or made for the purpose of the said navigation, such person shall be adjudged guilty of felony, and, on conviction, shall be compelled to work in chains upon the said navigation, for any term of time not exceeding seven years; and if any person shall throw dirt, trees, logs, or other rubbish in the way, so as to prejudice the navigation and works aforesaid, such person shall be answerable to the said company for treble the damages sustained thereby.

8. The said company shall have power and authority to use any materials in the vicinity of the works for opening the navigation aforesaid or keeping the same in repair, paying a reasonable price therefor, which price shall be ascertained in like manner as the value of land, which the company may take as aforesaid, in case they and the owners of said land cannot agree about the value thereof.

9. To all lands within two miles of the rivers so to be navigable as aforesaid, which have not been heretofore granted to any person, or reserved to the Catawba Indians, the said company and their successors shall have a preferable right, provided they survey and obtain a grant for the same, within three years from and after the passing of this act, and that the said company shall and may collect and reserve water for the use of their canals and locks, making satisfaction for the damages done thereby, the said damages to be ascertained in the manner before described, with respect to the value of land.

10. The said company shall and may, and they are hereby authorized and empowered, to import into this State any number of negroes, not exceeding three hundred, and that they shall have a credit for the duty on such negroes for five years from the time of importation.

11. Upon the said negroes being entered at the custom-house, the director or directors, agent or agents, of the said company, so entering them, shall make oath that they are imported for the sole purpose of being employed on the works aforesaid, and that they shall give bond, with security, for the payment of the duties of the same, at the expiration of the time aforesaid.

12. The said company and their successors, from time to time forever, shall be capable of purchasing, acquiring, or holding and possessing, and of selling and disposing of any negroes, or other goods and chattels, as well as any lands or real estates.

13. If any person shall be sued for any matter or thing done in pursuance of this act, he may plead the general issue, and give this act and the special matter in evidence, and on a verdict against the plaintiff, or a nonsuit or discontinuance, recover double costs.

14. This act shall be deemed and taken to be a public act, and judicially taken notice of as such, without special pleading, and liberally construed for carrying the purposes aforesaid into effect.

JOHN LLOYD,
President of the Senate.

JOHN JULIUS PRINGLE,
Speaker of the House of Representatives.

AN ORDINANCE for opening the navigation of a creek called the Stave Landing creek, and to dig a canal from the upper end of the said creek to the main road leading from Charleston to Camden.

Whereas, the company for opening the navigation of the Catawba and Wateree rivers have, by their petition to the General Assembly, represented that the opening of the navigation from the Wateree river up a creek called the Stave Landing creek, and to dig a canal from the upper end thereof to the main road leading from Charleston to Camden, by means of canals, dams, and locks, and clearing the obstructions now in the way, will be of public utility:

1. *Be it therefore ordained*, That the said company shall and may cause a navigation to be made from the said river to the public road aforesaid near Statesborough, or so far up as they may think necessary, by means of dams, canals, and locks, or in such other manner as to them shall seem most fit and convenient; and the said company shall be entitled to the same toll and other advantages as are granted to them for opening the navigation of the Catawba and Wateree rivers, by an act passed the 27th day of March last, entitled "An act for the opening of the navigation of the Catawba and Wateree rivers," and shall have the same powers and authorities, and be under the same restrictions, as therein mentioned.

JOHN LLOYD, *President of the Senate.*
JOHN JULIUS PRINGLE,
FEBRUARY 27, 1788. *Speaker of the House of Rep's.*

AN ORDINANCE for establishing a ferry near Rocky creek, on the Catawba river, and vesting the said ferry in the company for opening the navigation of the Catawba and Wateree rivers.

1. *Be it ordained*, That, from and immediately after the passing of this ordinance, a public ferry shall be established near Rocky creek, (that is to say, about a mile and a half below the said creek,) on the Catawba river, and that the said ferry shall be, and the same is hereby, vested in the company for opening the navigation of the Catawba and Wateree rivers, for the term of twenty-one years; that the said company may receive and take, during the said term, the following rates of ferriage, that is to say: for every man and horse, four pence; for a foot passenger, two pence; for a wagon and team, three shillings and six pence; for a rolling hogshead, one shilling and six pence; for a two-wheeled carriage and horse, two shillings and four pence; for every head of cattle, ferried or swam, three pence; for every head of sheep, hogs, or goats, two pence; and that the said company shall, during the said term, keep good and sufficient boats for transporting passengers, their servants, carriages and horses, and all cattle, sheep, hogs, goats, and rolling hogsheads, as well by night as by day.

Ratified the 27th of February, 1788.

AN ACT to confirm the title of the company for opening the navigation of the Catawba and Wateree rivers to lands purchased by them of Richard Ellis, and to vest in the said company the lands therein mentioned.

Whereas, the company for opening the navigation of the Catawba and Wateree rivers purchased five hundred acres of land at and near Rocky Mount, on the Catawba river, from Richard Ellis, for £581 16*s.* 3*d.*, and paid the said Richard Ellis £180, in part of the said purchase money, but have lately discovered that a moiety of the premises was conveyed to him by James Rugge, since the 26th day of February, 1782, and is therefore liable to be sold by the commissioners of confiscated estates, for the benefit of the public, as part of the estate of the said James Rugge, whose estate has been confiscated: And whereas, the price given for the said land was the value thereof at the time of the said purchase, but the value has been greatly increased by the improvements, labor, and expense of the said company; and, from the indigent circumstances of the said Richard Ellis, they could not be recompensed in damages on being evicted of the said land; and the said Richard Ellis having consented to release the said company from a moiety of their debt, and that such moiety shall be paid by them to the public, in case the Legislature think proper to confirm the title of the said company to the said land:

1. *Be it therefore enacted by the honorable the Senate and House of Representatives now met and sitting in General Assembly, and by the authority of the same*, That the right and title of the said company of, in, and to the land at and near Rocky Mount, on Catawba river, purchased by them of the said Richard Ellis, shall be, and the same is hereby confirmed and established, and the said land is hereby vested in the said company and their successors forever.

2. *And be it further enacted by the authority aforesaid*, That the said company shall pay to the commissioners of the Treasury of this State, agreeably to the instalment law, £290 18*s.* 1½*d.*, with interest from the first day of March, 1788, being a moiety of the purchase money of the said land: And whereas, by the act for incorporating the said company, they are entitled to all the lands within two miles of the said rivers from Camden ferry to the North Carolina line, which were not then granted to any person, or reserved for the Catawba Indians: *Provided*, The said company should cause the said lands to be surveyed within three years from the passing of the said act, which proviso subjects the said company to many inconveniences and difficulties in obtaining the said lands.

3. *Be it therefore enacted*, That all the lands within two miles of the said rivers, so to be made navigable, from Camden ferry to the North Carolina line, which were not granted before the 27th day of March, 1787, to any person or persons, or reserved for the Catawba Indians, shall be vested in the said company and their successors forever, any law to the contrary notwithstanding: *Provided always, nevertheless*, That any person who, between the 27th day of September, 1786, and the 27th day of March, 1787, made an actual and *bona fide* survey (on a warrant duly issued) of lands within two miles of the said rivers, shall be entitled to a grant for the land so surveyed, within six months next after the passing of this act, (but at no time afterwards,) if the persons who have caused such surveys to be made shall, after notice to the president of the said company of an intended application for a grant, show, to the satisfaction of the Governor and council, or to the commissioner of *caveats* in the district where the land lies, that such surveys have been actually and *bona fide* made as aforesaid.

In the Senate House, the 7th day of March, A. D. 1789, and in the 13th year of the independence of America.

DANIEL DESSAUSSURE, *President of the Senate.*
JACOB READ, *Speaker of the House of Rep's.*

AN ACT to establish a company for the opening the navigation of the Catawba rivers.

Whereas, John Rutledge, Thomas Sumpter, Isaac Huger, Benjamin Waring, Christian Senf, Daniel Bordeaux, Alexander Gillon, Joseph Atkinson, William Hill, and John Gaillard, of South Carolina, Esquires, have, for themselves and others, by their petition to the General Assembly, represented that the opening of the navigation of the Catawba rivers, from the South Carolina line, as far up both branches of the Catawba rivers as may be found practicable, by means of canals, dams, and locks, and clearing the same of the obstructions which are now in the way, would be of great public utility, that the said petitioners have entered into an agreement for establishing a company for opening the navigation of the said rivers, should it meet the sanction of the Legislature, and prayed to be incorporated by law, under the name or title of "The Company for opening the Navigation of the Catawba Rivers;" and that they may be vested with such powers, privileges, and immunities, for carrying the same into effect, similar to those powers, rights, and titles, as are granted to them as an incorporated company for opening the navigation of Catawba and Wateree rivers, by the State of South Carolina.

1. *Be it therefore enacted by the General Assembly of the State of North Carolina, and it is hereby enacted, by the authority of the same*, That the said petitioners, and such others as shall be admitted into the said company, shall be, and they are hereby, incorporated by the name and title of "The Company for opening the Navigation of the Catawba Rivers."

2. *And be it further enacted by the authority aforesaid*, That the said company, by the name and title aforesaid, shall and may sue, and be sued, implead, and be impleaded, in any court within this State; and that they may elect and appoint all necessary officers, and, from time to time, make such rules, regulations, and by-laws, as they shall think proper, for their own government, provided the same shall not be repugnant to, or inconsistent with, the constitution or any laws of this State.

3. *And be it further enacted by the authority aforesaid*, That the said company shall, and may cause a navigation to be made on the rivers aforesaid, by means of dams, canals, and locks, or in such other manner as to them shall seem most fit and convenient, from the South Carolina line, as far up both branches of the Catawba river as may be found practicable; and that they and their successors, for ninety-nine years, shall and may fix and establish, and be entitled to take and receive, by way of toll, for all goods and merchandise, carried on or through, and boats, vessels, and rafts, passing on or through the said rivers, within the limits aforesaid, such sums or rates, as the said company shall think proper to impose, not exceeding, at any time, twenty-five per cent. per annum, on the money which they shall have expended, in opening and keeping in repair the said navigation, to ascertain which the books of the said company shall always be liable to the inspection of the Legislature of this State; that the said toll shall be payable in the current money of the State; and that the said company, or their agents, may stop any goods, vessels, boats, or rafts, from passing on the said river, until payment of the said toll.

4. *And be it further enacted by the authority aforesaid*, That the said company shall have power to open, and keep open, such road or roads, on each side of the banks of the said rivers, as they may deem necessary for the use of the navigation aforesaid, and to purchase for themselves and their successors for ever, all such lands as may be necessary for the purposes aforesaid.

5. *And be it further enacted by the authority aforesaid*, That the said company shall be obliged to keep the said navigation in good and sufficient order and condition, on pain of being answerable for any damages occasioned by their wilful default or neglect.

6. *And be it further enacted by the authority aforesaid*, That the shares in the said company shall be ninety-nine years exempted from any rate, tax, duty, assessment, or imposition whatever; and that the said shares may be sold, transferred, assigned, or bequeathed by the proprietors respectively; and, in case of their dying intestate, shall go as personal estates, according to the statute of distributions.

7. *And be it further enacted by the authority aforesaid*, That if any person shall wilfully or maliciously cut, break down, damage, or destroy any bank, or other work to be erected, or made for the purpose of said navigation, shall throw dirt, trees, logs, or other rubbish in the way, so as to prejudice the navigation and works aforesaid, such person shall be answerable to the said company for treble the damages sustained thereby.

8. *And be it further enacted by the authority aforesaid*, That the said company, and their successors, from time to time, forever, shall be capable of purchasing or acquiring, holding, and possessing, and of selling and disposing of any negroes, and other goods and chattels, as well as of any lands or real estate.

9. *And be it further enacted by the authority aforesaid*, That if any person shall be sued for any matter or thing, done in pursuance of this act, he may plead the general issue, and give this act and the special matter in evidence; and on a verdict against the plaintiff, or a nonsuit or discontinuance, recover costs of suit.

10. *And be it further enacted by the authority aforesaid*, That this act shall be deemed and taken to be a public act, and judicially taken notice of as such, without special pleading, and liberally construed for carrying the purposes aforesaid into effect, provided that the State of South Carolina agrees that no restrictions, duty, or impost shall be laid on any commodities which is the growth, produce, or manufacture of the State of North Carolina, brought through the said canal or river, for sale or exportation, and that the same may be exported without re-inspection: *Provided, also*, That nothing contained in this act shall be construed to operate against the claim of the State, for any part of the territory included within the lines established as the southern boundary of the State, by the twenty-fifth article of the declaration of rights.

11. *And be it further enacted by the authority aforesaid*, That this act shall not take effect, nor be in force, until the State of South Carolina shall pass a law establishing this proviso a part thereof.

Read three times, and ratified in General Assembly the 6th day of December, 1788.

ALEXANDER MARTIN, *P. S.*
JOHN SITGREAVES, *S. C.*

STATE OF NORTH CAROLINA:

I, James Glasgow, Secretary of State aforesaid, do hereby certify the aforegoing to be a true copy of the act of Assembly, filed in the Secretary's office.

In testimony whereof, I have hereunto set my hand, at Fayetteville, this 6th day of December, Anno Domini 1788.

JAMES GLASGOW.

AN ACT to enable the United States to purchase a quantity of land in this State, not exceeding two thousand acres, for arsenals and magazines.

Whereas, the late Secretary of State of the United States, in his letter to the late Governor of this State, did request that he would take proper measures for obtaining the consent of the Legislature of this State, that the United States should purchase a quantity of land in this State, whereon arsenals and magazines might be erected.

1. *Be it therefore enacted by the honorable the Senate and House of Representatives now met and sitting in General Assembly, and by the authority of the same*, That the United States, or such person, or persons, as may be by them authorized, shall have a right to purchase, in any part of this State that may be thought most eligible, the fee simple of any quantity of land, not exceeding two thousand acres, for the purpose of erecting arsenals and magazines thereon, agreeably to the act of Congress, entitled "An act to provide for the erecting and repairing of arsenals and magazines, and for other purposes," passed on the 2d day of April, in the year of our Lord, 1794.

2. *And be it further enacted by the authority aforesaid*, That if the person or persons, whose land may be chosen for the abovementioned purpose, should not be disposed to sell the same, or if the persons appointed to make the purchase, should not be able to agree upon terms, with such owner or owners of the said land, the same shall be valued, upon oath, by a majority of five persons, to be appointed by the court of equity, or court of common pleas of this State, for that purpose; and the land shall be vested in the United States, upon their paying the amount of such valuation to the owner or owners of such land.

3. *And be it further enacted by the authority aforesaid*, That the said land, when purchased, and every person or officer residing or employed thereon, whether in the service of the United States or not, shall be subject and liable to the Government of this State, and the jurisdiction, laws, and authority thereof, in the same manner as if this act had never been passed; and that the United States shall exercise no more authority or power within the limits of the said land, than they might have done previous to the passing of this act, or than may be necessary for the building, repairing, or internal government of the arsenals and magazines to be erected thereon, and to the regulation and management of the same, and of the officers and persons by them to be employed in or about the same: *Provided always*, That the said land shall forever be exempt from any taxes to be paid to the State.

In the Senate House, the 12th day of December, in the year of our Lord 1795, and in the 20th year of the independence of the United States of America.

DAVID RAMSAY, *President of the Senate.*

ROBERT BARNWELL,
Speaker of the House of Representatives.

AN ACT to give further encouragement to the proprietors for the opening the navigation of the Catawba and Wateree Rivers.

Whereas the General Assembly of the State of North Carolina, by an act passed at Fayetteville, in the year of our Lord 1788, did incorporate sundry persons therein named, and such others as shall be associated with them, by the title of "The Company for opening the Navigation of the Catawba Rivers," and did grant to them the right of causing a navigation to be made on the rivers aforesaid, by means of dams, canals, and locks, or in such other manner as to them shall seem most fit and convenient, from the South Carolina line, as far up both branches of the Catawba river as may be found practicable, with certain other privileges therein mentioned: *Provided*, That the State of South Carolina agree that no restrictions, duty, or impost, shall be laid on any commodity which is the growth, produce, or manufacture of the State of North Carolina, brought through the said canals or rivers, for sale or exportation; and that the same be exported without re-inspection.

I. *Be it therefore enacted by the honorable the Senate and the House of Representatives in General Assembly met, and it is hereby enacted by the authority of the same*, That no restriction, duty, or impost, shall be laid, by any law to be made by this State, on any commodity which is the growth, produce, or manufacture of the State of North Carolina, brought through the said canals or rivers, for sale or exportation; and that the same may be exported, without any re-inspection to be required by any law of this State, unless the State of North Carolina shall hereafter agree that the said commodities shall be subject to the same regulations of inspection, as the commodities of this State are liable to, coming from the Catawba river: *And provided*, That nothing in this act shall extend to prevent the companies of the Wateree and Catawba navigation, and the company of the Santee navigation, from imposing such tolls on the aforesaid commodities from North Carolina, as they impose on the commodities of the growth, produce, or manufacture of this State, going through their respective navigations.

2. *And be it further enacted by the authority aforesaid*, That nothing contained in the said act of North Carolina shall be construed as a waiver, or relinquishment of the claim of the said State, to part of the territory of this State; but the said claim shall be, and remain, in the same plight, as if this act had not been passed.

In the Senate House, the 12th day of December, in the year of our Lord 1795, and in the 20th year of the independence of the United States of America.

DAVID RAMSAY, *President of the Senate.*

ROBERT BARNWELL,
Speaker of the House of Representatives

Rules and By-laws of the Catawba and Wateree Company.

1. That the stock of the company being divided into six hundred shares, should continue so divided.

2. That on the third Tuesday in March, in every year, the company shall meet in Charleston, when a president and six directors shall be chosen by ballot from among the proprietors; and on the same day a secretary shall be chosen, likewise, by ballot.

3. That, in voting, every proprietor shall be entitled to one vote for every share by him or her held, either in his own right, or as trustee, guardian, attorney, or proxy, for any other proprietor.

4. That any proprietor of full age, by a writing, under his hand, and executed before one witness, may depute any person to vote as proxy for him or her, at any meeting.

5. That no persons shall be elected to the office of president, director, secretary, or any other office, unless he shall have a majority of the votes present.

6. The president and three directors shall form a quorum, and shall transact all such business as shall be committed to them by the said company; but in case of the necessary absence of the president, then any four directors shall form a quorum, and be authorized to do business in the same manner as if the president were present.

7. In case of the absence, incapacity, or death of the president, the directors, or a majority of them, shall choose, by ballot, from among themselves, a person to discharge the duties of that office, until the return of the president, if absent, or otherwise, until the next general meeting and election; and in case of a vacancy by absence, incapacity, or death, in the directorship, the directors, or a majority of them, shall fill up such vacancy, by ballot,

out of the proprietors, who shall continue to fulfil the duties of director, until the next general meeting and election, or the return of such director, if absent.

8. That all orders and transactions, by the president and board of directors, and also all proceedings at any meeting of the proprietors, be copied in a book to be provided and kept for that purpose, and signed by the president, or presiding director, as the case may be; that an account of the proceedings of the board of directors be laid before the company at their meetings, and that, on finding them fairly and justly stated, the proprietors then present, or a majority of them, shall give a certificate thereof, a duplicate of which shall be entered in the books.

9. That every proprietor shall pay 40*s.* sterling on each share, on the third Tuesday in the month of September, 1793, and the like sum of 40*s.* sterling, on the third Tuesdays in March and September, in every succeeding year, until the objects of the company shall be completed. And if the president and a majority of all the directors shall judge it necessary, either to raise a larger or smaller sum than the one specified above, they shall be at liberty to do so, and to call for the same to be paid on the days abovementioned: *Provided*, The sum so called for on each share, in addition to the aforesaid sum of 40*s.*, directed to be paid in the months of September and March, in every year, shall not exceed 40*s.*: *Provided also*, That such additional requisition shall be made on the said third Tuesdays in the months of March and September.

10. That if any proprietor shall fail to make any payments, to which by the rules of the company he or she may be liable, when it shall become due, or within three days thereafter, every such proprietor shall forfeit to the company all the preceding payments, and also all his or her interest in the said company.

11. That each and every payment shall be made to one or other of the cashiers of the banks, who is hereby authorized to receive the same, and give receipts on the scrip, and carry the sum so paid to the credit of the company.

12. That the Board of directors take under their direction the funds of the company, that they have powers to settle all past accounts, and to fix the salary and duties of the secretary; to convene the stockholders when they may think proper, (giving at least six days notice thereof) to procure, at the expense of the company, a suitable person, or persons, to plan and execute the whole business; to make any arrangements and contracts they may think proper, for beginning and carrying on the said works, and to do all other things which may be necessary for completing the same, in the best and most expeditious manner. *Provided*, That no contract entered into with one of their own body shall be binding on the company, till it is laid before the stockholders, and approved of by a majority of the members present.

13. That none of the foregoing rules shall be altered at any meeting of the proprietors, unless there shall be present two-thirds of the shares subscribed for, nor then, unless two-thirds of the shares voting shall agree to the alteration.

Resolved, That if the establishment of a national arsenal, foundry, manufactory, &c. should be determined to be made at or near the Catawba or Wateree river, that this company will undertake to point their endeavors more immediately to the rendering of the river navigable, with all imaginable expedition, up to the place which shall have been so fixed on for a national arsenal, &c.

Resolved, That should the United States find any site proper for such an establishment, on lands belonging, or partly belonging, to this company, that they will cheerfully cede the same to the United States, for such purposes, upon a fair and just valuation.

At a meeting of the Catawba Company, the 4th of March, 1802, two-thirds of them being present.

1. On motion resolved, that the six hundred shares in the company of the Catawba and Wateree rivers be subdivided into twelve hundred.

2. That the present proprietors be entitled to hold double the number of their present shares; and that they have besides a preference to extend the number of their shares to one for every ten, to which they shall be entitled after such subdivision.

3. That every new subscriber, who shall pay fifty dollars, shall be entitled not only to the advantages to be derived from the opening of said rivers, but also to a proportionate interest in the lands vested in the company by the Legislature of this State.

4. That where a person has paid any part of the sum required by any former resolution of the company, such person shall be entitled to all the rights and privileges of a proprietor, under this subdivision of shares, upon his paying to the secretary, on or before the first day of May next ensuing, all his arrears which may be then due.

5. That the secretary open the books on the eighth day of March instant, at 10 o'clock in the forenoon of the same day, and so from day to day until the 13th of the said month, inclusive, for the purpose of receiving subscriptions; and that he be authorized to receive, at the time, the sum of fifty dollars, on each and every share, which money shall be paid into the South Carolina bank.

6. That in case more shares should be subscribed for than what are vacant, the same rule of reduction shall be adopted, which lately took place in the subscription to the State bank.

7. That as soon as the subscription is closed, the secretary shall advertise a meeting of the stockholders on the 16th of March, being the anniversary, for the purpose of confirming the old, or establishing such new rules as may be thought necessary, and to organise the company in such a manner as to enable them to begin the work this ensuing summer.

8. *Resolved*, That one hundred shares be reserved to be offered to the State of South Carolina, and that an equal number of shares be reserved to be tendered to the State of North Carolina.

At an anniversary meeting of the Catawba Company, on Tuesday the 16th instant, the following resolves were entered into:

"That an advertisement be published, inviting persons to contract for the opening of Graves's ford, and Love's ford, so deep and wide as to admit boats drawing two feet nine inches water, and twelve feet wide; also, for opening a road and carrying place from above Rocky Mount to the ferry landing below, and for constructing a bridge across Rocky creek; also, for building a ferry boat to ply across the river, at or near the present landing on Rocky Mount; also, for surveying the vacant lands, which have been already granted them by the Legislature. Such undertakers to give approved security for the faithful fulfilment of their respective contracts, and to direct their applications to the president, Judge Grimke, during the sitting of the constitutional court at Columbia, from

the 19th to the 24th of April next, or to Charles Tew, the secretary, in Charleston, on or before the 15th day of May next ensuing.

"That the president do establish a correspondence with some mercantile house in Camden, and endeavor to obtain permission to lodge with them the moneys of the company, and that they would disburse the same, according to the directions of the company.

"That one hundred shares be offered to the citizens of North Carolina, and that they have to the first day of January next ensuing, to subscribe for such shares; and that General Davie be authorized to appoint some person, or persons, in that State, to receive such subscriptions on the part of the company payable as in the following resolution:

"That Colonel Senf, Colonel Hill, and John Simpson, Esq., clerk of Lancaster court, be authorized to receive subscriptions from such persons as are inclined to become proprietors, and who reside within the limits of this State, and that they take notes, payable to the president and directors of the company for opening the navigation of the Catawba and Wateree rivers, on the first day of May, 1803, and that they be authorized to deliver receipts for the same in the nature of scrip, in such form as the president and directors shall appoint.

"That these resolutions, with the late publication in the papers of this city, as far as the president and directors shall deem necessary and proper, be inserted in Freneau's and Williams's gazettes, in this city; and in the one which is printed at Raleigh, North Carolina, by Joseph Gales, once a month until the 1st of October next.

"That the solicitor of the company be instructed to adopt the most immediate measures for the recovery of such balances, as appear to be due by such proprietors as have paid none of the requisitions for the last eighteen months past, and that the secretary do furnish him with a list of the names of such as are defaulters.

"That the following mode be adopted as the uniform rule of transferring the shares of this company: 'I, A. B. do transfer my right to shares No. forty, (the number to be in letters, and not in numerals) in the company for opening the navigation of the Catawba and Wateree rivers, unto C. D. for value received. Signed A. B. Witnessed by E. F. G. H. Proved on oath before me, by L. M. —— J. P.

"That the sum of one shilling and two pence be paid on each share, on the requisition which shall become due on the third Tuesday of September next, ensuing, and the same sum on the third Tuesday of May, thereafter.

South Carolina, ——— 180—.

"Received of ——— a note payable to the president and directors of the company, for opening the navigation of the Catawba and Wateree rivers, for fifty dollars, which, when paid, will entitle him to be a stockholder in the said company.

C. No. 3.

JAMES RIVER CANAL.

Sir: Richmond, *October* 21, 1807.

Agreeably to your request for answers to *queries respecting canals*, I beg leave to present you with the following; but which, it is feared, may not be so perfect as is wished for.

1. *Points united by canal, and their distance by said canal.*

The points united by the James River Canal, including some intermediate sluicing and locks, are James River, above the great falls at Westham; and parallel with tidewater at and within the city of Richmond, distance between six and seven miles; of this, about one half is a continued cut, terminating in a basin.

2. *Elevation of the highest ground through which canal passes; descent thence to the two extremities; and number of miles where canal is level.*

The cut being generally through low ground, near the margin of the river, and on hill sides, no considerable depth has been necessary in the former; but on the hill side, many hundred yards were nearly of solid rock, with such steep descent that the upper side in some places is probably thirty feet perpendicular; while the lower side was of little more height than sufficient for the embankment and footway. The descent from the upper to the lower end of the continued cut or canal, is about one foot to the mile; the length of this part between three and four miles; the perpendicular height from tide water to the basin about eighty feet.

3. *Number, dimensions, contents, construction and situation of locks.*

There are three locks; two of them eighty feet long, sixteen feet wide in the chamber, and about twelve feet high; the other not so high; they are constructed with hewn stone, situated or bottomed upon solid rock blown out for the purpose; they are filled by side sluices, about three feet square, having the axis or hinge of the gate, at the bottom of the sluice.

4. *Supply of water; whence obtained; its amount reduced to cubic feet per minute, hour, or day; its elevation above the highest point of the canal; length of feeders; situation and contents of reservoirs; what additional resources may be resorted to, if the present supply should fall short of the quantity wanted.*

The supply of water is from an arm of the main river; it is forced by means of a stone dam across the smallest arm, to an island, through a large stone archway or set of gates, sixteen feet in breadth, besides two side arches which may be used if necessary, into a broad canal about two hundred yards in length, down to the locks; depth of water at the gates, generally about four feet; the dam across to the island being kept tight, the supply of water is considered as competent to the demand; no other resource than the river can be obtained.

5. *Designation of such parts of the route, where the natural or improved bed of rivers is used.*

Above the locks, the bed of the river has been improved by sluicing, wing walls, &c., for about two hundred and twenty miles, in a great number of places, to wit: from Westham up to Crows ferry, a short distance above Pattonsburg; and produce is brought down frequently, for about forty miles above that place;* there are also very

* It may not be improper to observe here, that if the improvements of the river above Crows ferry (beyond which the James River Company are not bound by the charter to proceed) was extended as far as may be practicable, and this may be effected, it is conceived, at no very great expense, it would reach a part of the country, from whence a road to Greenbrier river may be made; and thus, comparatively, a short portage would connect the head waters of James river with the Western waters, and render the transportation and intercourse easy, safe, and the route much shorter than by any other mode of communication known between the Atlantic and the Western country.

considerable improvements between the lock gates and the upper end of the continued cut or canal; here again the water is raised and forced through a stone arch or gateway into the canal, by means of a stone dam extending into the river.

6. *Depth and breadth of canal; burthen of vessels; breadth of towing paths.*

The canal is generally from three to four feet in depth; the breadth twenty-five feet or more; the vessels are generally about eight tons burthen, but do not commonly take full loads; there are no regular towing paths, except at particular passes where the sluices are rapid; and these are only for men, no horses being used for the purpose of towing, on any part of the work.

7. *Aqueducts across valleys or rivers; tunnels through hills; bridges across the canal.*

There are three aqueducts across the valleys and basin; two of stone, and one of brick, to take off small streams and rain water; no tunnels through hills; three wooden bridges for carriages; and three for foot passengers, across the canal.

8. *Particular obstructions and difficulties surmounted, or to be encountered.*

Immense quantities of stone in the cut or canal have been blown; the lower side throughout puddled with strong clay; the bottom also puddled partially; the difficulties as to these parts of the work are pretty well surmounted. In the river immense quantities of stone above and under water have also been blown; dams and wing walls of stone raised to render the work perfectly complete, although it is now, and for some time past has been, considered as legal in the improvement; yet much labor may be laid out advantageously for extending the utility of the navigation in dry seasons.

9. *Defects either in the plan or execution, and the proposed remedies.*

The defects in the plan arise principally, it is conceived, from an idea which prevailed at the time of its formation, that locks to communicate with tide water were necessary. On this head see the printed statement to the Legislature of Virginia, marked No. 2. Defects in the execution are principally in the locks already erected; for although they are substantial, they leak; no cement which has ever been tried, (and many experiments have been made,) will for any considerable time stand within the joints. This defect in some degree retards the passage of the boats. Skilful artists in cements and proper materials are the remedies looked for, but when or where they will be found is yet uncertain.

10. *Estimate of the tonnage on vessels; species, weight, and value of the articles annually conveyed by the canal; expense of carriage by the canal compared with land or river carriage before canal was made; time employed in navigating through the whole canal.*

No estimate of the tonnage of vessels has been kept; but the transportation of coal alone in the year 1803 required two thousand and twenty-two loads; each load by a boat capable of taking about eight tons when the river is sufficiently high. The printed statement, No. 2, will show the principal articles which passed through the canal in the year 1803; since that period some fluctuation has taken place, as will appear by the extract from the books. The expenses of carriage through the canal, and transportation down the river, from the highest point practicable as it relates to the company, are blended in one tariff; for instance, a hogshead of tobacco pays 2*s.* 6*d.*, come from where it will. Before the existence of the canal, it was not unusual to pay from nine to twelve shillings per hogshead in winter, and seldom less than 7*s.* 6*d.* per hogshead, for the wagonage only from Westham, which is but a very short distance above the locks. In descending it requires about two hours from the locks to the basin; in ascending somewhat more time is necessary.

11. *Capital already expended, vested, or wanted for completing the work.*

The capital expended up to the 1st of January, 1805, will be best explained by reference to the printed statement, No. 2; and up to the present time, including interest on the sums actually advanced and borrowed, as well as on the application of tolls, may I think fairly be stated at between 4 and $500,000. It cannot at present be ascertained with any precision, what sum will be requisite to complete all the improvements which the work is susceptible of beyond those which the law requires; but the expense yet to be incurred will, in all probability, be very considerable.

12. *Expenses per mile, and in the whole, and as far as practicable of every component part of the work in all its details.*

This must be taken in the aggregate, as the money has been expended on a tract of about two hundred and twenty miles on irregular, detached, and unequal spots, by laborers and superintendents employed for this purpose, no minute account being kept of what each place required, nor any part of the work done in jobs, or by undertakers, renders it impossible now to go into details with any accuracy.

13. *Rate and gross amount of tolls; annual expenses of repairs and contingencies; annual nett income.*

14. *Substance of charters and acts of Legislature on the subject.*

The answers to these two queries, the thirteenth and fourteenth, will appear by reference to the charter and laws, marked No. 1; and by also referring to the printed statement, No. 2, and the extract from the books.

It is regretted that the queries cannot at present obtain more full and perfect answers. Should any particular part of the work be specified, and the cost thereof be required, every information which can be obtained will be furnished with pleasure.

With much respect, I am, sir, your most obedient,

W. FOUSHEE, *P. J. R. Co.*

Acts of General Assembly for clearing and improving the navigation of James river.

AN ACT for clearing and improving the navigation of James river: Passed October session, 1784.

SECTION 1. Whereas the clearing and extending the navigation of James river from tide water upwards to the highest parts practicable on the main branch thereof, will be of great public utility, and many persons are willing

to subscribe large sums of money to effect so laudable and beneficial a work; and it is just and proper that they, their heirs, and assigns, should be empowered to receive reasonable tolls in satisfaction for the money advanced by them in carrying the work into execution, and for the risk they run.

Sec. 2. And whereas it may be necessary to cut canals and erect locks or other works on the sides of the said river, *Be it enacted by the General Assembly*, That it shall and may be lawful to open books in the city of Richmond, the borough of Norfolk, at Botetourt court-house, at the town of Lewisburg, in Greenbrier county, and at Charles Irving's store, in Albemarle, for receiving and entering subscriptions to the amount of $100,000 for the said undertaking, under the management of Turner Southall and James Buchanan, in the city of Richmond; of Robert Taylor, John Kearnes, and Thomas Newton, Jun., in the borough of Norfolk; of William Cabell and Charles Irving, at Irving's store; Patrick Lockhart and George Skellern, at Botetourt court-house; George Clendinen and Andrew Donnolly, at Lewisburg; which subscriptions shall be made personally or by power of attorney, and shall be paid in Spanish milled dollars, but may be paid in other silver or in gold coin of the same value. That the said books shall be opened for receiving subscriptions on the 1st day of February next, and continue open until the 10th day of August next inclusive; and, on the 20th day of the said month of August, there shall be a general meeting of subscribers at the city of Richmond, of which meeting notice shall be given by the said managers, or any three of them, in the Virginia gazette at least one month before the next said meeting. And such meeting shall and may be continued from day to day until the business is finished. And the acting managers, at the time and place aforesaid, shall lay before such of the subscribers as shall meet according to the said notice, the books by them respectively kept, containing the state of the said subscriptions, and if one-half of the capital sum aforesaid should, upon examination, appear not to have been subscribed, then the said managers at the said meeting are empowered to take and receive subscriptions to make up the deficiency; and a just and true list of all the subscribers, with the sums subscribed by each, shall be made out and returned by the said managers, or any four or more of them, under their hands, into the general court, to be there recorded. And in case more than $100,000 shall be subscribed, then the same shall be reduced to that sum by the said managers or a majority of them, by beginning at and striking off from the largest subscription or subscriptions, and continuing to strike off a share from all subscriptions under the largest and above one share, until the sum is reduced to the capital aforesaid of $100,000, or until a share is taken from all subscriptions above one share, and lots shall be drawn between subscribers of equal sums to determine the number in which such subscribers shall stand on a list to be made for striking off as aforesaid; and if the sum subscribed still exceeds the capital aforesaid, then to strike off by the same rule until the sum subscribed is reduced to the capital aforesaid, or all the subscriptions are reduced to one share; and if there still be an excess, then lots are to be drawn to determine the subscribers who are to be excluded, to reduce the subscriptions to the capital aforesaid, which striking off shall be certified in the list aforesaid; and the said capital sum shall be reckoned and divided into five hundred shares of $200 each, of which every person subscribing may take and subscribe for one or more whole shares, and not otherwise: *Provided*, That unless one-half of the said capital shall be subscribed, all subscriptions made in consequence of this act shall be void; and in case one-half and less than the whole of the said capital shall be subscribed as aforesaid, then the president and directors are hereby empowered and directed to take and receive the subscriptions which shall be first offered in whole shares as aforesaid, until the deficiency shall be made up, a certificate of which additional subscriptions shall be made, under the hands of the president and directors, or a majority of them for the time being, and returned to and recorded in the general court aforesaid.

Sec. 3. *And be it enacted*, That in case one-half of the said capital or a greater sum shall be subscribed as aforesaid, the said subscribers, and their heirs and assigns, from the time of the said first meeting, shall be, and are hereby, declared to be incorporated into a company by the name of the "James River Company," and may sue and be sued as such; and such of the said subscribers as shall be present at said meeting, or a majority of them, are hereby empowered and required to elect a president and four directors for conducting the said undertaking, and managing all the said company's business and concerns for and during such time not exceeding three years, as the said subscribers, or a majority of them, shall think fit. And in counting the votes of all general meetings of the said company, each member shall be allowed one vote for every share as far as ten shares, and one vote for every five shares above ten, by him or her held at the time in the said company; and any proprietor, by writing under his or her hand, executed before two witnesses, may depute any other member or proprietor to vote and act as proxy for him or her at any general meeting.

Sec. 4. *And be it enacted*, That the said president and directors so elected, and their successors, or a majority of them assembled, shall have full power and authority to agree with any person or persons on behalf of the said company to cut such canals, and erect such locks, and perform such other works as they shall judge necessary for opening, improving, and extending, the navigation of the said river above tide water, to the highest part thereof to which navigation can be extended, and carrying on the same from place to place, and from time to time, and upon such terms and in such manner as they shall think fit; and out of the money arising from the subscriptions and the tolls, and other aids herein after given, to pay for the same, and to repair and keep in order the said canals, locks, and other works necessary thereto, and to defray all incidental charges; and also to appoint a treasurer, clerk, and such other officers, toll-gatherers, managers, and servants, as they shall judge requisite, and to agree for and settle their respective wages or allowances, and to settle and sign their accounts; and also to make and establish rules of proceeding, and to transact all the other business and concerns of the said company, in and during the intervals between the general meetings of the same; and they shall be allowed as a satisfaction for their trouble therein, such sum of money as shall, by a general meeting of the subscribers, be determined. *Provided, always*, That the treasurer shall give bond, in such penalty, and with such security as the said president and directors, or a majority of them, shall direct, for the true and faithful discharge of the trust reposed in him, and that the allowance to be made to him for his services shall not exceed three pounds in the hundred, for the disbursements by him made; and that no officer in the said company shall have any vote in the passing or settlement of his own account.

Sec. 5. *And be it enacted*, That the said president and directors, and their successors, or a majority of them, shall have full power and authority, from time to time, as money shall be wanted, to make and sign orders for that purpose, and direct at what time and in what proportion the proprietors shall advance and pay off the sums subscribed, which orders shall be advertised at least one month in the Virginia gazettes; and they are hereby authorized and empowered to demand and receive of the several proprietors, from time to time, the sums of money so ordered to be advanced for carrying on and executing, or repairing and keeping in order the said works, until the sums subscribed shall be fully paid, and to order the said sums to be deposited in the hands of the treasurer, to be by him disbursed and paid out as the said president and directors, or a majority of them, shall order and direct: And if any of the said proprietors shall refuse or neglect to pay their said proportions, within one month after the same shall be so ordered and advertised as aforesaid, the said president and directors, or a majority of them, may sell at auction, and convey to the purchaser, the share or shares of such proprietor so refusing or neglecting payment, giving at least one month's notice of the sale in the Virginia gazette, and after retaining the sum due, and charges

of sale out of the money produced thereby, they shall refund and pay the overplus, if any, to the former owner; and if such sale shall not produce the full sum ordered and directed to be advanced as aforesaid with the incidental charges, the said president and directors, or a majority of them, may, in the name of the company, sue for and recover the balance by action of debt, or on the case; and the said purchaser or purchasers shall be subject to the same rules and regulations as if the said sale and conveyance had been made by the original proprietor. And to continue the succession of the said president and directors and to keep up the same number.

Sec. 6. *Be it enacted*, That from time to time, upon the expiration of the said term for which the said president and directors were appointed, the proprietors of the said company, at the next general meeting, shall either continue the said president and directors, or any of them, or choose others in their stead; and in case of the death, removal, resignation, or incapacity, of the president, or any of the said directors, may and shall, in the manner aforesaid, elect any other person or persons, to be president and directors in the room of him or them so dying, removing or resigning; and may, at any of their general meetings, remove the president or any of the directors, and appoint others for and during the remainder of the term, for which such person or persons were at first to have acted.

Sec. 7. *And be it enacted*, That every president and director, before he acts as such, shall take an oath or affirmation, for the due execution of his office.

Sec. 8. *And be it enacted*, That the presence of proprietors, having one hundred shares, at least, shall be necessary to constitute a general meeting, and that there be a general meeting of proprietors on the first Monday of October in every year, at such convenient town as shall be, from time to time, appointed by the said general meeting; but if a sufficient number should not attend on that day, the proprietors who do attend may adjourn such meeting from day to day till a general meeting of the proprietors shall be had, which may be continued from day to day until the business of the company shall be finished, to which meeting the president and directors shall make report, and render distinct and just accounts of all their proceedings; and on finding them fairly and justly stated, the proprietors then present, or a majority of them, shall give a certificate thereof, a duplicate of which shall be entered on the said company's books; and at such yearly general meetings, after leaving in the hands of the treasurer such sum as the proprietors, or a majority of them shall judge necessary for repairs and contingent charges, an equal dividend of all the nett profits arising from the tolls hereby granted shall be ordered and made to and among all the proprietors of the said company, in proportion to their several shares; and upon any emergency in the interval between the said yearly meetings, the said president, or a majority of the said directors, may appoint a general meeting of the proprietors of the said company, at any convenient town, giving at least one month's previous notice in the Virginia gazettes, which meeting may be adjourned and continued as aforesaid.

Sec. 9. *And be it enacted*, That for and in consideration of the expenses the said proprietors will be at, not only in cutting the said canals, erecting locks, and other works for opening the different falls of the said river, and improving and extending the navigation thereof, but in maintaining and keeping the same in repair, the said canals and works, with all their profits, shall be, and the same are hereby, vested in the said proprietors, their heirs and assigns forever, as tenants in common, in proportion to their respective shares, and the same shall be deemed real estate, and be forever exempt from payment of any tax, imposition, or assessment whatever, and that it shall and may be lawful for the said president and directors, at all times forever hereafter, to demand and receive, at the most convenient place, at or near the falls between Westham and tide water, tolls according to the following table of rates, to wit:

	Parts of a dollar.
Every pipe or hogshead of wine, containing more than 65 gallons,	45-72
Every hogshead of rum, or other spirits,	36-72
Every hogshead of tobacco,	30-72
Every cask between 65 & 35 gallons, half of a pipe or hogshead. Barrels one fourth part, and smaller casks or kegs in proportion, according to the quality and quantity of their contents of wine or spirits.	
For casks of linseed oil, the same as spirits.	
Every bushel of wheat, peas, beans, or flax seed,	5-288
Every bushel of Indian corn, or other grain, or salt,	2½-288
Every barrel of pork,	15-72
Every barrel of beef,	10-72
Every barrel of flour,	30-288
Every ton of hemp, flax, potash, bar, or manufactured iron,	$1 3-72
Every ton of pig iron, or castings,	25-72
Every ton of copper, lead, or other ore, other than iron ore,	60-72
Every ton of stone or iron ore,	12-72
Every hundred bushels of lime,	38-72
Every chaldron of coals,	12-72
Every hundred pipe staves,	6-72
Every hundred hogshead staves, or pipe, or hogshead heading,	15-288
Every hundred barrel staves or barrel heading,	10-288
Every hundred cubic feet feet of plank or scantling,	25-72
Every hundred cubic feet of other timber,	55-288
Every gross hundred weight of all other commodities or packages,	15-288
Every boat or vessel which has not commodities on board to yield so much; provided that an empty boat or vessel returning, whose load has already paid at the respective places, the sums fixed at each, shall repass toll free,	$1 3-72

Which tolls may be discharged in foreign gold or silver coin of the present fineness at the present rates. But if any of the coin aforesaid should hereafter be rendered less valuable than they are at present, either by lessening their weight, or therewith adding a greater quantity of alloy than is in them respectively at present, then so much of any of the said coins, the value of which is so reduced, to be received for the tolls aforesaid, as is equal in value to the said coins in their present state of fineness and weight, shall be payable for the said tolls, at their reduced value only. And in case of refusal or neglect to pay the toll at the time of offering to pass through any of the said places, and previous to the vessels passing through the same the collectors of the said tolls may lawfully refuse passage to such vessel; and if any vessel shall pass through without paying the said toll, then the said collectors may seize such vessel, wherever found, and sell the same at auction for ready money, which, so far as is necessary, shall be applied towards paying the said toll, and all expenses of seizure, and the balance, if any, shall be paid to the owner; and the person having the direction of such vessel shall be liable for the toll, if the same is not paid by the sale of such vessel as aforesaid: *Provided*, That the said proprietors, or a majority of them, holding at least three hundred

shares, shall have full power and authority, at any general meeting, to lessen the said tolls, or any of them, or to determine that any article may pass free of toll.

Sec. 10. *And be it enacted*, That the said river, and the works to be erected thereon in virtue of this act, when completed, shall forever thereafter, be esteemed and taken to be navigable as a public highway, free for the transportation of all goods, commodities, and produce whatsoever, on payment of the tolls imposed by this act: and no other toll or tax whatever, for the use of the water of the said river, and the works thereon erected, shall at any time hereafter be imposed: And whereas, it is necessary for the making the said canal locks, and other works, that a provision should be made for condemning a quantity of land for the purpose.

Sec. 11. *Be it enacted*, That it shall and may be lawful for the said president and directors, or a majority of them, to agree with the owners of any land, through which the said canal is intended to pass, for the purchase thereof; and in case of disagreement, or in case the owner thereof shall be a *feme coverte*, under age, *noncompos*, or out of the State, on application to any two justices of the county in which such land shall lie, the said justices shall issue their warrant under their hands, to the sheriff of their county, to summon a jury of twenty-four inhabitants of his county, of property and reputation, not related to the parties, nor in any manner interested, to meet on the land to be valued, at a day to be expressed in the warrant, not less than ten, nor more than twenty days thereafter; and the sheriff, upon receiving the said warrant, shall forthwith summon the said jury, and, when met, provided there be not less than twelve, shall administer an oath or affirmation to every juryman that shall appear; "That he will faithfully, justly, and impartially value the land (not exceeding in any case the width of one hundred and fifty feet) and all damages the owner thereof shall sustain by the cutting the canal through such land, according to the best of his skill and judgment; and that in such valuation, he will not spare any person for favor or affection, nor any person grieve for hatred, malice, or ill will." And the inquisition thereupon taken, shall be signed by the sheriff, and some twelve or more of the jury, and returned by the sheriff to the clerk of his county, to be by him recorded. And upon every such valuation, the jury is hereby directed to describe and ascertain the bounds of the land by them valued, and their valuation shall be conclusive on all persons, and shall be paid by the said president and directors, to the owner of the land, or his legal representatives; and on payment thereof, the said company shall be seized in fee of such land, as if conveyed by the owner thereof to them, and their successors, by legal conveyance. *Provided, nevertheless*, that if any further damage shall arise to any proprietor of land, in consequence of opening such canal, or in erecting such works, than had been before considered and valued, it shall and may be lawful for such proprietor, as often as any such new damage shall happen by application to, and a warrant from, any two justices of the county where the lands lie, to have such further damage valued in like manner, and to receive and recover the same of the said president and directors. But nothing herein shall be taken or construed to entitle the proprietor of any such land to recover compensation for any damages which may happen to mills, forges, or other works or improvements which shall be begun or erected by such proprietor, after such first valuation, unless the same damage is wilfully or maliciously done by the said president and directors, or some person by their authority.

Sec. 12. *And be it enacted*, That the said president and directors, or a majority of them, are hereby authorized to agree with the proprietors for the purchase of a quantity of land, not exceeding one acre, at or near the places of receipt of tolls aforesaid, for the purpose of erecting necessary buildings; and in case of disagreement or any of the disabilities aforesaid, or the proprietor being out of the State, then such land may be valued, condemned, and paid for as aforesaid for the purpose aforesaid. And the said company shall, upon payment of the valuation of the said land, be seized thereof in fee simple as aforesaid. And whereas some of the places through which it may be necessary to conduct the said canals, may be convenient for erecting mills, forges, or other water works, and thepersons, possessors of such situation, may design to improve the same, and it is the intention of this act not to interfere with private property but for the purpose of improving and perfecting the said navigation.

Sec. 13. *Be it enacted*, That the water, or any part thereof, conveyed through any canal or cut made by the said company, shall not be used for any purpose but navigation, unless the consent of the proprietors of the land through which the same shall be led, be first had; and the said president and directors, or a majority of them, are hereby empowered and directed, if it can be conveniently done, to answer both the purposes of navigation and water works aforesaid, to enter into reasonable agreements with the proprietors of such situation, concerning the just proportion of the expenses of making large canals or cuts capable of carrying such quantities of water as may be sufficient for the purposes of navigation, and also for any such water works as aforesaid.

Sec. 14. *And be it enacted*, That it shall and may be lawful for every of the said proprietors to transfer his share or shares, by deed executed before two witnesses, and registered, after proof of the execution thereof, in the said company's books, and not otherwise, except by devise, which devise shall also be exhibited to the president and directors, and registered in the company's books, before the devisee or devisees shall be entitled to draw any part of the profits from the said tolls. *Provided*, That no transfer whatsoever shall be made, except for one or more whole share or shares, and not for part of such shares; and that no share shall at any time be sold, conveyed, transferred, or held in trust, for the use and benefit, or in the name of another whereby the said president and directors, or proprietors of the said company, or any of them, shall or may be challenged, or made to answer concerning any such trust, but that every person appearing as aforesaid to be a proprietor, shall, as to the others of the said company, be to every intent taken absolutely as such, but as between any trustee and the person for whose benefit any trust shall be created, the common remedy may be pursued.

Sec. 15. *And it is hereby further provided*, That each proprietor who shall be desirous of selling his share or shares, shall first offer the same to such person as shall be hereafter empowered by the General Assembly to purchase shares on public account; and it is hereby declared that such person acting for the commonwealth, shall have the preference in all such sales, if he will give the same consideration for which the proprietor shall really and *bona fide* sell. And whereas, it hath been represented to this General Assembly, that sundry persons are willing and desirous, on account of the great public advantages and improvement their estates may receive thereby, to promote and contribute towards so useful an undertaking, and to subscribe sums of money to be paid on condition the said works are really completed and carried into execution, but do not care to run any risk, or desire to have any property therein.

Sec. 16. *Be it therefore enacted*, That the said president and directors shall be, and are hereby, empowered to receive and take in subscriptions upon the said condition, and upon the said works being completed and carried into execution, according to the true intent and meaning of this act, that it shall and may be lawful for the said president and direc tors, or a majority of them, in case of refusal or neglect of payment, in the name of the company as aforesaid, to sue for, and recover of the said subscribers, their heirs, executors, or administrators, the sums by them respectively subscribed, by action of debt, or upon the case in any court of record within this State.

Sec. 17. *And be it enacted*, That if the said capital and the other aids already granted by this act shall prove insufficient, it shall and may be lawful for the said company from time to time to increase the said capital by the addition of so many more whole shares as shall be judged necessary by the said proprietors, or a majority of them, holding at least three hundred shares, present at any general meeting of said company; and the said president and

directors, or a majority of them, are hereby empowered and required, after giving at least one month's previous notice thereof in the Virginia gazettes, to open books in the beforementioned places for receiving and entering such additional subscriptions, in which the proprietors of the said company for the time being shall and are hereby declared to have the preference of all others for the first thirty days after the said books shall be opened as aforesaid of taking and subscribing for so many whole shares as any of them shall choose. And the said president and directors are hereby required to observe in all other respects the same rules therein as are by this act prescribed for receiving and adjusting the first subscriptions, and in like manner to return under the hands of any three or more of them an exact list of such additional subscribers, with the sums by them respectively subscribed, into the general court as aforesaid, to be there recorded; and all proprietors of such additional shares shall, and they are hereby declared to be, from thenceforward incorporated into the said company.

Sec. 18. *And be it hereby enacted and declared*, That the tolls herein before allowed to be demanded and received at the place abovementioned are granted, and shall be paid on condition only that the said "James River Company" shall make the river well capable of being navigated in dry seasons by vessels drawing one foot water at least from the highest place practicable to the Great Falls, beginning at Westham, and shall at or near the said falls make such cut or cuts, canal or canals, with sufficient locks if necessary, each of eighty feet in length, and sixteen feet in breadth, as will open a navigation to tide water in all places at least twenty-five feet wide, except at all such locks, and capable of conveying vessels or rafts drawing four feet water at the least into tide water, or shall render such part of the river navigable in the natural course.

Sec. 19. *And it is hereby provided and enacted*, That in case the said company shall not begin the said work within one year after the said company shall be formed, or shall not complete the same within ten years thereafter, then shall all the interest of the said company, and all preference in their favor as to the navigation and tolls aforesaid be forfeited, and cease: *Provided*, That in case the navigation shall be opened from Westham to tide water before the opening of the river above Lynch's Ferry, the tolls abovementioned may be collected until the expiration of ten years from the time at which the company shall have been formed.

Sec. 20. *And be it further enacted*, That the treasurer of this commonwealth shall be authorized and directed to subscribe to the amount of one hundred shares in behalf of the same, and the money necessary in consequence of such subscription shall be paid as the same shall be required. And the treasurer for the time being shall have a right to vote according to such shares, in person or by proxy appointed by him, and shall receive the proportion of the tolls aforesaid, which shall from time to time become due to this State for the shares aforesaid.

Sec. 21. *And be it further enacted*, That so much of every act and acts within the purview of this act shall be, and the same is hereby, repealed. *Provided, nevertheless*, That nothing in this act shall be construed so as to take away the right which the representatives of John Balendine have to that part of the canal which is already begun, and to all the advantages resulting from the same; but the same shall be valued by a jury in manner and form as is before directed, and the said representatives shall be entitled to so many shares in the said company and to so much of the surplus water as the said jury shall determine; or they shall receive at their option the value thereof in money, to be estimated by the said jury.

AN ACT vesting in George Washington, Esq. a certain interest in the companies established for opening and extending the navigation of Potomac and James rivers: Passed October session, 1784.

Section 1. Whereas, it is the desire of the representatives of this commonwealth to embrace every suitable occasion of testifying their sense of the unexampled merits of George Washington, Esq. towards his country; and it is their wish in particular that those great works for its improvement which, both as springing from the liberty which he has been so instrumental in establishing, and, as encouraged by his patronage, will be durable monuments of his glory, may be made monuments also of the gratitude of his country.

Sec. 2. *Be it enacted by the General Assembly*, That the treasurer be directed, in addition to the subscriptions he is already authorized to make to the respective undertakings for opening the navigations of the Potomac and James rivers to subscribe to the amount of fifty shares to the former, and a hundred shares to the latter, to be paid in like manner with the subscriptions above mentioned; and that the shares so subscribed be, and the same are hereby, vested in George Washington, Esq. his heirs and assigns forever, in as effectual a manner as if the subscriptions had been made by himself or by his attorney.

AN ACT to amend the act entitled "An act for vesting in George Washington, Esq. a certain interest in the companies established for opening and extending the navigation of James and Potomac rivers:" Passed October session, 1785.

Whereas, by an act entitled "An act for vesting in George Washington, Esq. a certain interest in the companies established for opening and extending the navigation of James and Potomac rivers," and reciting "that whereas it is the desire of the representatives of this commonwealth to embrace every suitable occasion of testifying their sense of the unexampled merits of George Washington, Esq. towards his country; and it is their wish in particular that those great works for its improvement which, both as springing from the liberty which he has been so instrumental in establishing, and, as encouraged by his patronage, will be durable monuments of his glory, may be made monuments also of the gratitude of his country:" It is enacted "that the treasurer be directed, in addition to the subscriptions he is already authorized to make to the respective undertakings for opening the navigations of Potomac and James rivers to subscribe to the amount of fifty shares to the former, and one hundred shares to the latter, to be paid in like manner with the subscriptions above mentioned; and that the shares so subscribed be, and the same are hereby, vested in George Washington, Esq. his heirs and assigns forever, in as effectual a manner as if the subscriptions had been made by himself or by his attorney." And whereas the said George Washington, Esq. in his letter addressed to the Governor, which has been laid before the General Assembly, hath expressed his sentiments thereupon in the words following, to wit: "Your excellency having been pleased to transmit me a copy of the act appropriating to my benefit certain shares in the companies for opening the navigation of James and Potomac rivers, I take the liberty of returning to the General Assembly, through your hands, the profound and grateful acknowledgments inspired by so signal a mark of their beneficent intentions towards me. I beg you, sir, to assure them that I am filled on this occasion with every sentiment which can flow from a heart warm with love for my country, sensible to every token of its approbation and affection, and solicitous to testify in every instance a respectful submission to its wishes. With these sentiments in my bosom, I need not dwell on the anxiety I feel in being obliged in this instance to decline a favor which is rendered no less flattering by the manner in which it is conveyed than it is affectionate in itself. In explaining this obligation, I pass over a comparison of my endeavors in the public service, with the many honorable testimonies of approbation which have already so far overrated and

overpaid them; reciting one consideration only, which supersedes the necessity of recurring to every other. When I was first called to the station with which I was honored during the late conflict for our liberties; to the diffidence which I had so many reasons to feel in accepting it, I thought it my duty to join a firm resolution to shut my hand against every pecuniary recompense; to this resolution I have invariably adhered—from this resolution (if I had the inclination) I do not consider myself at liberty to depart. While I repeat, therefore, my fervent acknowledgments to the Legislature for their very kind sentiments and intentions in my favor, and at the same time beg them to be persuaded that a remembrance of this singular proof of their goodness towards me will never cease to cherish returns of the warmest affection and gratitude, I must pray that their act, so far as it has for its object my personal emolument, may not have its effect. But if it should please the General Assembly to permit me to turn the destination of the fund vested in me from my private emoluments to objects of a public nature, it will be my study in selecting these to prove the sincerity of my gratitude for the honor conferred on me by preferring such as may appear most subservient to the enlightened and patriotic views of the Legislature." And whereas, the desire of the General Assembly to mark by the provison above mentioned their sense of the illustrious merits of the said George Washington, Esq. at the same time that it is strengthened by this fresh and endearing proof of his title to the gratitude of his country, is superseded by their respect for his disinterested wishes and patriotic views.

SEC. 2. *Be it enacted*, That the said recited act, so far as it vests in George Washington, Esq. and his heirs the shares therein directed to be subscribed in his name, shall be, and the same is hereby, repealed.

SEC. 3. *And be it further enacted*, That the said shares with the tolls and profits hereafter accruing therefrom, shall stand appropriated to such objects of a public nature, in such manner and under such distributions as the said George Washington, Esq. by deed during his life, or by his last will and testament, shall direct and appoint.

AN ACT to amend an act entitled "An act for clearing and improving the navigation of James river:" Passed October, 1785.

Whereas, by the act entitled "An act for the clearing and improving the navigation of James river," it is among other things provided that the first subscription should not exceed the sum of $100,000, and that no toll should be demanded except in a particular case before the said river should be rendered capable of being navigated in dry seasons by vessels drawing one foot of water at the highest place practicable to the Great Falls: And whereas it hath been represented to the General Assembly that it may be necessary to extend the sum to be subscribed, and to put the depth of the canals in the discretion of the company, and the point to which the navigation is directed to reach before the demand of the tolls, is, by being too vague, a discouragement to adventurers.

SEC. 2. *Be it therefore enacted by the General Assembly*, That it shall be lawful for the said company at any general meeting to extend the shares so as not to exceed one hundred in addition to those already subscribed, and to proportion the depth of the water in the canals to the depth of water in the river in dry seasons.

SEC. 3. *And be it further enacted*, That Crow's ferry, at the mouth of Loony's creek, shall be forever taken and deemed to be the highest place practicable within the meaning of the above-recited act: And whereas, it may be found expedient for the said company to borrow money to answer the purposes of their institution:

SEC. 4. *Be it further enacted*, That it shall be lawful for the president and directors to give an interest of six per centum upon all sums of money that shall be lent to them for the carrying on of the work.

AN ACT giving a more speedy remedy against delinquent subscribers to the Potomac and James river companies: Passed the 1st of December, 1787.

SECTION 1. Whereas, it hath been represented to the General Assembly that the opening of the navigation in Potomac and James rivers hath been retarded by the failure of many of the members of the companies instituted for the purpose of effecting the same to pay their respective subscriptions: And whereas, the mode of recovery now established by law hath been found wholly inadequate thereto, and works of such general utility, to which the commonwealth hath already advanced several sums of money, from time to time, as the same hath been called for, ought not to be frustrated by the delinquency of individuals:

SEC. 2. *Be it therefore enacted by the General Assembly*, That, if any subscriber to the Potomac or James river company now is, or hereafter shall be, in arrear for any sum or sums of money called for in pursuance of either of the two acts of General Assembly, the one entitled "An act for opening and extending the navigation of Potomac river," and the other entitled "An act for opening and extending the navigation of James river," it shall and may be lawful for a majority of the directors of each company to recover any such sum or sums of money from such subscriber, in the general court, at any additional or other session thereof, together with all legal costs, by way of motion to the court: *Provided*, The person against whom such notice may be made hath ten days previous notice thereof: *Provided, also*, That, if the person against whom such motion may be made, or his attorney, shall desire a jury to be empannelled, the court shall direct a jury to be immediately charged to try whether he did assume to pay, and whether he hath paid; but the said directors shall not be required to prove that he did so assume, until he shall have first made oath that he did not so assume; and it shall be lawful for the said court to direct judgment to be entered upon the verdict rendered, with costs, and execution shall issue thereupon, returnable to any day of the said session of the general court which the said court shall direct.

SEC. 3. So much of the said recited acts of Assembly as comes within the purview of this act is hereby repealed.

SEC. 4. *Provided, always*, That so much of this act as relates to the Potomac company shall be suspended until the Legislature of the State of Maryland shall pass a law to the same effect.

AN ACT to amend an act entitled "An act establishing district courts, and for regulating the general court:" Passed December 17, 1789.

SECTION 8. The general court shall have jurisdiction to hear and determine motions against the delinquent subscribers of the Potomac and James river companies.

AN ACT to amend the act entitled "An act for clearing and improving the navigation of James river:" Passed Dec. 25, 1790.

SECTION 1. Whereas, it is represented to the General Assembly that the navigation of James river is much obstructed by hedges and fish-traps:

SEC. 2. *Be it therefore enacted by the General Assembly*, That, if any persons shall hereafter make, or cause to be made, any hedges, fish-traps, or other obstructions in the said river, or any of the navigable branches thereof, from the upper end of the James river canal to the highest navigation of the said river or the branches thereof, so as to impede or injure the passage of batteaux or canoes, shall forfeit and pay the sum of £100 for each offence, to be recovered by bill, plaint, or information in any court of record, one-half for the use of the informer, the other half for the use of the commonwealth.

AN ACT to amend the act entitled "An act for clearing and improving the navigation of James river:" Passed Dec. 20, 1790.

SECTION 1. Whereas, it hath been represented to the present General Assembly that the original sum subscribed by the James river company as a capital for improving the navigation from Crow's ferry, in the county of Botetourt, to tide water opposite the city of Richmond, is nearly expended, and it becomes necessary to make further provision for completing the work, by increasing their capital stock:

Be it therefore enacted, That it shall and may be lawful for the president and directors of the said company to open new subscriptions for two hundred shares, in addition to the five hundred shares already subscribed; and books for that purpose shall be opened by the president and directors of the said company, in the same manner and at such places as directed by an act entitled "An act for clearing and improving the navigation of James river," and at such other places as the said president and directors, or a majority of them, shall think proper; those who shall become proprietors of shares by subscriptions as aforesaid shall be secured in their interest of the said company, be liable to all the conditions, and subject to all the penalties, as prescribed in the said recited act, and also one other act entitled "An act giving a more speedy remedy against delinquent subscribers to the Potomac and James river companies."

SEC. 2. The treasurer for the commonwealth shall be, and he is hereby, empowered and required to subscribe, in behalf of the commonwealth, for one hundred shares in the new subscriptions to be opened for extending the capital of the said company for the purpose aforesaid: *Provided always, and be it further enacted*, That the treasurer shall, on behalf of the commonwealth, subscribe not more than fifty shares, until the like number shall be subscribed for by private citizens; after which the treasurer may subscribe, from time to time, as many shares as shall be subscribed by individuals, so as not to exceed fifty more shares, and so as to make up one hundred additional shares on public account.

SEC. 3. And whereas, by the said recited act, a right of pre-emption is reserved to the commonwealth of purchasing such share or shares as the proprietors in the James river navigation shall offer for sale, and there having been no agent as yet appointed, agreeably to the said recited act, to make such purchases:

Be it therefore enacted, That the treasurer, for the time being, shall, and he is hereby authorized and empowered to purchase, in behalf of the commonwealth, so many shares in the said company as shall be offered for sale, provided the same shall not exceed fifty shares, nor exceed the sum to be paid by the original proprietor for each share.

SEC. 4. It shall be the duty of the directors of the said James river company to make return once in every year, between the first day of October and the first day of November, to the treasurer of this commonwealth, of the delinquent subscribers for shares in the said company, and the said directors may make sale thereof, at such time and place as they shall appoint, with consent of the treasurer, giving at least three months' previous notice thereof in some of the public newspapers; and, if any of the shares of such delinquents shall sell for less than the amount for which such delinquents may be in arrears, the directors shall forthwith cause the most effectual legal measures to be taken for the recovery of such arrears.

AN ACT for regulating the navigation of James river, above the falls of the said river: Passed December 17, 1791.

SECTION 1. *Be it enacted*, That every person who shall be proprietor of any boat or other vessel which shall be employed in navigating the waters of James river and its branches above the Great Falls at Richmond, in the transportation of any produce or merchandise whatsoever, either raised or manufactured within this commonwealth, or imported from any other place without the same, shall, in the clerk's office of the county in which the said proprietor or proprietors shall then live, enter the number of each boat or vessel so to be employed, which number, together with the name of the county, and the name of the owner or owners of such boat or vessel, shall be written or painted on each side of the said vessel, on some conspicuous part of the outside thereof, in large and plain letters, not less than four inches in length.

SEC. 2. If the owner or owners of any boat or vessel which shall be employed in navigating the waters of the said river, above the falls thereof as aforesaid, shall fail to enter in the clerk's office as aforesaid the name or names of the owner or owners, the name of the county in which he or they shall reside, and the number of each boat or other vessel as aforesaid, or shall fail to write or paint the name or names of the owner or owners of the said boat or other vessel in manner above directed, so as to continue plain and legible as long as the said boat or other vessel shall be employed in navigation, he, she, or they shall forfeit and pay the sum of twenty shillings for every day he, she, or they shall neglect to comply with the purposes of this act, to be recovered by any person who may sue for the same, by warrant from a magistrate, allowing the said owner or owners one month after the first day of April next, to attend to the requisitions aforesaid.

SEC. 3. This act shall commence and be in force after the first day of April next.

AN ACT giving further time to the James river company to complete the navigation thereof: Passed November 14, 1793.

SEC. 1. *Be it enacted by the General Assembly*, That the further time of six years from and after the period mentioned in and by an act of Assembly, passed in the year 1784, entitled "An act for clearing and improving the navigation of James river," shall be, and is hereby, allowed the James river company to complete the said work, and any thing in the said recited act to the contrary notwithstanding.

SEC. 2. This act shall commence in force from the passing thereof.

Report of the agents of the James River Company.

The agents for the James river Company consider it as a duty incumbent on them, whenever any important step with the affairs of the company is about to be taken, to give the fullest information in their power to all who are concerned; and, as the commonwealth of Virginia is deeply interested in a bill now before the House of Delegates, beg leave respectfully to present to each member of the Legislature a statement of the situation of the company from its commencement to the present day. Facts ascertained on oath, and an equitable calculation, to show the expense to which the commonwealth and individuals have been subjected, independent of the risk that has been run of a failure in the undertaking altogether, and the ground on which the remuneration promised in the act of incorporation, for laborious services, which have at length successfully eventuated in great benefits to the community, as well as to particular individuals in a very considerable district of country, is confidently expected. Various acts of the Legislature, from the year 1784 to 1798, inclusive, have passed relative to the James river Company.

The act of incorporation has had several alterations made in it, such as extending the capital; ascertaining the highest point of navigation; extending the time for completion; the borrowing of money at six per cent., and suspending the erection of locks from the basin to tide water, until the Legislature shall think it reasonable to enforce the same.

The stock of the company consisted originally in five hundred shares of $200 each, and was increased two hundred shares, so as to constitute an aggregate of $140,000; of this the State now holds two hundred and fifty shares, or $50,000, independent of a donation made of one hundred shares, or $20,000.

The requisitions on the original five hundred shares commenced on the first day of December, 1785, and ended on the 20th February, 1791; those on the two hundred additional shares (in subscribing for which the commonwealth would only go hand in hand with private individuals) commenced on the first day of April, 1792, and ended, as appears by the date of the last payment on the auditor's books, on the 24th day of December, 1795, previous to which time the whole number of shares were subscribed for under the law; that, in the year 1796, the funds being exhausted, the company were compelled to resort to loans; and many of the individual proprietors advanced considerable sums, which have been repaid with six per cent. interest.

This work has progressed under considerable difficulties, at great labor and expense, and at much risk to those engaged in it; for a long time the prospect of succeeding was gloomy; and, until very lately, it has not afforded any compensation either to the public or to individuals.

As agents for the said company, we do not pretend that all the improvements on the bed of the river which we think necessary are yet made, although, in common dry seasons, it is considered that the law has been complied with; the company, however, are going on to do what they consider as requisite, and which their own interest calls for as fast as the seasons and circumstances will permit. They have, at proper seasons, employed for this purpose a manager, with a suitable number of hands for his superintendence, for eight years out of the last nine years; four years of this time, to wit, 1796, '98, '99, and 1800, their exertions were on the bed of the main river, between Crow's ferry and Lynchburg; in 1801, '2, '3, and '4, the labor has been bestowed, for the same purpose, below Lynchburg. Upwards of $7,000 have been spent on the bed of the main river, and upwards of $4,000 on its branches, to wit, on Willis's to Cairo; on the Rivanna to Milton; and on the North river, above the mountain, to Lexington; thus extending the benefits of navigation laterally from fifteen to forty-five miles, so as to embrace about fifty or sixty miles in breadth, causing an expenditure of upwards of $11,000 on the beds of the rivers, independent of a sum, probably, but little inferior in amount, by holding themselves in a state of preparation to work on the bed of the main river, which expense, but for such preparation, would not otherwise have been necessary; a very considerable sum, indeed, will still be requisite to complete the improvements contemplated thereon.

We are willing to admit, that, although in the uncommon drought of the year 1803, the full depth of water required in the river by the act of incorporation may not have been found in all places, yet, from the testimony made to a committee on this subject during the last session of Assembly, the difference was very inconsiderable. Mr. Edmund Tate, on that occasion, proved on oath, that although he did not think the improvement on the bed part of the river was agreeable to law, yet that he considered the shallowest sluices to have at least nine or ten inches depth of water in them; and he also stated, that *twelve inches* of water through those shoals would not, in his opinion, bring down more than two or three hogsheads of tobacco. This subject has been since fully ascertained, as will appear by the affidavits hereunto subjoined, and which prove that Mr. Tate, who was produced as a witness against the company, gave a more correct opinion than was then generally entertained on that head. An experiment has been made, and proof obtained, that four thousand and fifty pounds weight will sink a common batteau or boat one foot into the water, and that an empty batteau will draw seven inches and a half of water.

In the extensive improvements made and contemplated by this company, their first object has been *safety;* their second, *facility of conveyance.* This system they have pursued, and mean still to pursue; their inclination, duty, and interest all combine to make the navigation, at an early period, as safe and easy as may be practicable on any rational foundation; and that their exertions have not been without effect, is evinced by the quantity of produce brought down the river in the year 1803, to wit: 16,917 hogsheads of tobacco; 170,588 bushels of wheat; 58,183 barrels of flour; 34,248 bushels of corn; 2,022 coal boats; besides a variety of other articles, making, altogether, a transportation much greater than in any former year, notwithstanding the extreme dryness of the season in which the diminution of the water in the river was unparalleled (they believe) in the memory of man. In the present year, 1804, they are sorry to say, that the produce has been much less, to wit, a deficiency of upwards of three thousand hogsheads of tobacco; nearly one hundred thousand bushels of wheat; upwards of twenty thousand barrels of flour; and near ten thousand bushels of corn; yet the river has been much fuller than in the preceding year, and it is not understood that tobacco, wheat, or flour have remained on hand up the river; this deficit is supposed to arise from the shortness of the crop.

One-half of all sums received by the company, and disposed of in dividends, go to the public, and to those to whom they have made the donation spoken of; the rate of dividends, previous to the last, sent annually $6,000 into the treasury, and $2,400 were also furnished to the support of the Washington academy, and then left a sum sufficient to commence and prosecute the improvements on the bed of the river, as fast as reason and propriety would justify. We regret sincerely the cause which rendered the dividend for the last six months to be twenty-five per cent. less than former ones, and then left only a trifling balance, (less than £50,) to commence the operations of the new year with, a sum much inferior to what has been heretofore retained for this purpose.

It may here not be amiss to observe that, in addition to the capital stock of - -	£42,000 0 0
The interest thereon, at 6 per cent. from the dates of various requisitions, which commenced on the first day of December, 1785, to the first day of January, 1802, when the first dividend took place, amounts to - - - -	£31,131 13 9
Making, in principal and interest, before any remuneration whatever to the public or to individuals was had, of - - - - -	£73,131 13 9

This sum is independent of the applications of money arising from tolls, rents of water and of ground, and which became indispensably necessary, as every aid by loans at 6 per cent. proved to be inadequate, and all further prospect of obtaining funds in that way had ceased.				
The tolls commenced partially in April, 1794, half only being then demanded, and in 1796 full tolls were received. These to the 1st January, 1802, before any dividend was made, amounted to - - - - - -	£21,992	14	7¾	
Since that period, with the rents to the 1st January, 1805, they have produced a further sum of - - - -	18,799	6	11½	
Making altogether an aggregate of - - - -	40,792	1	7¼	
The dividends commenced in 1802, and have been continued to 1st January, 1805, and amount, in the whole, only to - -	13,490	0	0	
If this sum is deducted from the tolls, rents of water and of ground, it will then leave, from this source, an expenditure on the work of -	-			£27,302 1 7¼
Which, being added to the principal and interest, is - - -	-			£100,483 15 4¼

We consider this statement of expenses actually incurred as giving a fair and full view of the subject on that head, and is one which we trust will prove satisfactory. The paltry sum retained, as has been already stated, (less than £50,) is too inconsiderable to merit notice, and is, therefore, not deducted.

If it should be thought equitable that an interest ought to be looked for on all money actually expended, then it will require upwards of six thousand pounds per annum to give legal interest, a sum greater than the tolls have ever produced in one year; but if the interest shall be confined to the principal money advanced, with its simple interest thereon, and that for no longer a term than until the dividends commenced, it will be found that £73,131 13 9 will require for six per cent. interest, the sum of £4,386 1 2 annually. In the last six months only £1,890 could be spared for division, and which for that period is but four and a half per cent. on £42,000, instead of having an interest on the sum of £73,131 13 9 expended independent of the money which arose from tolls, &c.; but whatever the sum may be, which is produced by the tolls, &c., it should be remembered that the whole cannot be applied to dividends; so far from it, that a very large proportion is annually to be applied in supporting the establishment, and carrying on the work. In the last year these amounted to upwards of £1,500; in the present year a much greater sum will probably be requisite.

That the risk which the commonwealth and individuals have run in the success of this work, may not be considered as chimerical, or resting on assertion only, we beg leave to refer to the affidavits and certificates on this subject hereunto annexed, in which it will be seen that shares of sixty pounds value, which had been fully paid up, were sold for a great length of time far below par; that, in the summer of 1792, they were worth only forty to forty-five pounds per share, and that about ——— they were so far reduced in value, as to be actually disposed of at twenty-five pounds per share, so greatly were they depreciated on account of the risk, or bad prospect of success.

We will not trespass on your time, by referring to instructions to managers sent up to improve the bed of the river, or to their reports thereon; nor make statement of disappointments in aid expected, and which had been promised by some of those who are now complaining, further than to say, that the gentlemen of Lynchburg had, in the year 1803, at their own request, through their agent Mr. Christopher Clarke, almost a *carte blanche* given them, to have the work contiguous to themselves done in their own way, and by persons of their own choosing; and that their drafts on the company should be paid; all which they declined, but of which they did not inform us until too late to be remedied that season on that part of the river. In the last year, 1804, they were solicited, through several of their respectable and influential citizens, to advise or direct the manner of the improvements near them, or to procure some person, in whom they had confidence, to superintend the execution of the work; although the latter has been partly complied with, yet we are sorry to find, in contradiction to a report made to us by the person we sent up, and not contradicted by their superintendent, but will be supported, we are told, by him, clamors continue to be made by the inhabitants of that town, of negligence and want of inclination in the company to comply with the law.

Thus much we have thought it necessary to say in vindication, confining ourselves to the improvements wished for on the bed of the river; and beg leave to remark, that the bill alluded to, as it now stands, goes to criminate the company. Can this be right, before a just ascertainment is actually made by impartial and adequate judges, of the true state of the improvements which may be necessary to comply with the act of incorporation, if any such further improvements shall be found necessary? We think not, and contend that the improvements are complete, as to law, but not as to the interest or intentions of the company. Should not the bill be altered herein, and be so worded as only to produce a selection of upright, able, and disinterested persons to view the river, and make report? This we cordially invite, and only suggest that, as it would be highly improper for a shareholder to be appointed, we consider it equally so that any petitioner, or resident in the counties bordering on the river, should be selected for this purpose.

As to the section of the bill respecting locks, we shall be very brief: The session of 1798 passed a law suspending their erection until the company should consider them necessary, or a future Legislature shall think it reasonable to enforce their execution. The preceding statement and remarks would, in our opinion, be fully sufficient, of themselves, to show, that at present, and, perhaps for a very considerable time to come, it would be highly unreasonable to enforce the erection of locks, or incur the expense to communicate with tide water. But there are other reasons, strong, indeed, why it will be improper to do this, viz:

A descent of eighty-six feet perpendicular will require a very considerable number of locks, say twelve to fifteen, to give a rational ground of security, and, with the greatest care, they are subject to sap and blow up, passing principally through earth only. The cost of those locks will, in our judgment, be upwards of twenty thousand pounds. This sum, if expended for this purpose, will preclude not only the expected remuneration to the public, and to individuals, or a great length of time, but will prohibit the improvements contemplated and thought necessary by the company for the bed of the river, beyond what has been, or can be, forced from them by law; and thus the public treasury would lose, for a very considerable time indeed, probably not less than six thousand dollars per year; the valuable support of education, on the state of which the freedom or slavery of a country depends, will be withdrawn, in all probability, to an amount of more than two thousand four hundred dollars per annum; and individuals, who advanced and risked their money, will be deprived of an annual income equal to both these mentioned. For such a sacrifice some evident and solid benefit to the community should, at such a juncture, press hard indeed. Is this

the case? Has it been known, or can it be proved, that one cent more has ever been given for the hundred, nay for the hogshead of tobacco, at Rocket's warehouse, than for a like quantity at Shockoe? We know that it has not. Besides, will any prudent merchant ship inspected tobacco, which has come down by water, without stripping and seeing that it is free of damage? This cannot be done in the upland boats, but is generally done in the public or private warehouses, and certainly makes the basin the most proper place for landing the tobacco.

Much stress has been laid on the necessity for locks to facilitate the transportation of coal from the basin. Experience has proved that coal, water borne, cannot be lodged at Rocket's, in safety, without encountering an expense which that article will not bear, and that it is better to pursue the present mode. In proof of this, we refer to the subjoined affidavit of a gentleman well conversant on this subject, and much interested in this article. The same reason will apply to all bulky and heavy articles.

But, admitting the locks to be erected, will there not then be additional expense by loss of time in passing and repassing them; in hand hire to unload; in detention of the vessel and crew, if the vessel shall be ready to receive the load, (but which more frequently will not be the case,) and if no vessel be ready then, to deposite the produce in, security from freshets, &c. which are frequently very sudden, can only be done by placing it in a situation very considerably elevated; to do this, will require more expense than the present mode, independent of the shipping of it afterwards. In addition, we observe that the state of the river is so fluctuating, and the unfitness of small boats loaded, to pass or remain in tide water when the wind blows, is so manifest, that no prudent man will, in our opinion, ever place a reliance on this mode of transporting valuable produce from the basin to Rocket's, although his vessel may sometimes be ready to receive it; and that if the means for land carriage should be once destroyed, great injury must be the consequence in blowing weather, or if any accident should happen to a single lock.

As to small boats, such as are fit for the upper navigation, being able to proceed in the mildest state of the river, or in the calmest weather any distance below Rocket's, it seems almost unnecessary to deny. Will any rational being, carrying on trade, employ, at great risk, a boat capable of holding but a few hogsheads of tobacco, say six to ten, if you will, and which requires at least three prime hands to manage her, when, at Rocket's, he can get a vessel carrying one hundred hogsheads or upwards, and which will require perhaps not more than three hands to transport the whole in perfect safety, and with infinitely more expedition? It is certainly unnecessary to say more on this part of the subject.

With much regret we find ourselves compelled, in justice to the public, as well as that we owe to the individuals represented by us, to say that we consider the bill now before the Legislature as being premature in its censure, as it takes for granted that which is yet to be ascertained, and, therefore, so far as this is embraced and connected with the clause directing a communication with tide water, we consider it to be at least *impolitic* and *unreasonable.*

Impolitic—Because, in the present happy and affluent condition of our common country, and that of the State of Virginia in particular—the surplus wealth, of which there is much, ought to be employed in useful improvements of a general nature—when censure can be easily procured, or the advantages which may fairly and equitably be looked for under acts of incorporation, be withheld or withdrawn under pretext and without due proof, every incentive to engage in arduous and hazardous undertakings is completely destroyed, and thereby works of the most promising utility totally prevented; for if neither credit nor emolument can be counted on with some certainty, who will engage in such works? We have said that it is

Unreasonable—Because if, after encountering every risk and difficulty, and an expense far greater than what was ever calculated on, and before scarcely any reimbursement worth mentioning shall be had, those who have already suffered, are to be forced into a further expense, perhaps more than a moiety of what was at first contemplated for the whole, and this, too, for an object, to say the best of it, extremely problematical, and which, under existing circumstances, we deem totally useless, proves to demonstration, in our judgment, that to enforce the measures intended by the bill will be highly unreasonable.

Permit us to ask, is it reasonable that those who have contributed to a work confessedly of great public utility, should be permitted to obtain comparatively nothing on their money? and this must be the inevitable result if the bill passes into a law in its present form, while they see others not engaged in such useful pursuits, and where they run no risk, gaining, perhaps, double the profits they can expect.

Is it reasonable to prevent an annual return into the public treasury of a large sum to replace, or compensate by the alleviation from taxes, for money which has been drawn indiscriminately from the pockets of the citizens at large, and to employ the money so withheld, on an object, the utility of which, to say the most in its favor, is extremely doubtful, and is one, in our judgment, which cannot benefit the planter or the farmer even in the district in which it is to be expended. Convinced that it is not reasonable, and impressed with a full hope and belief that the information herein given, will meet with serious consideration and a just and equitable decision, we rest confident that the bill, on the subject of the James river Company, will be confined to the appointment of competent, upright, and disinterested men to view and decide on the improvements made, or necessary to be made, on the bed of the main river, in conformity to the act of incorporation.

W. FOUCHEE, *President.*
EDW. CARRINGTON, }
GEO. PICKETT, } *Directors.*
ROBERT GAMBLE, }
JAMES BROWN. }

RICHMOND, *January* 14, 1805.

CITY OF RICHMOND, *sct:*

This day, Hezekiah Mosby, of lawful age, personally appeared before me, magistrate of the city aforesaid, and made oath in due form, that, some few days ago, in the presence of Mr. Orris Paine and Mr. John Smith, he measured the depth of water which two empty boats drew, and that each boat required seven and a half inches of water to float in; that he also measured, at the same time, a loaded boat, and that she drew one foot and nine inches; that he saw the coal taken out of the boat, and that the load, by the coal-yard measure, was one hundred and eighty-three bushels, and that forty-five bushels of coal sunk the boat one foot into the water; that he carefully weighed twenty-five bushels of coal measured as above; that he averaged the bushel, and found that the forty-five bushels of coal weighed only four thousand and fifty pounds, and that he saw one hogshead of tobacco brought down in a boat, which weighed two thousand seven hundred and thirteen pounds net.

Given under my hand this 14th day of January, 1805.

H. MOSBY.

Sworn to before me, this 15th January, 1805.

JOHN ADAMS.

CITY OF RICHMOND, *sct:*

This day, John Smith, of lawful age, personally appeared before me, a magistrate for the city aforesaid, and made oath in due form, that some few days ago, in the presence of Mr. Orris Paine and Mr. Hezekiah Mosby, he mea-

sured the depth of water which two empty boats drew, and that each boat required seven and a half inches of water to float in; that he also measured, at the same time, a loaded boat, and that she drew one foot and nine inches; that he saw the coal taken out of the boat, and that the load, by the coal-yard measure, was one hundred and eighty-three bushels, and that forty-five bushels of coal sunk the boat one foot into the water.

Given under my hand this 14th day of January, 1805.

JOHN M. SMITH.

Sworn to, before me, this 15th January, 1805.

JOHN ADAMS.

RICHMOND, *December* 31, 1804.

I do certify that I sold and received for three and one-half shares in the James river Company, on the 1st day of April, in the year 1792, the net sum of one hundred and fifty-five pounds; and on the 1st day of June, in the same year, I received for one share, the sum of forty pounds only. This appears from my own, and from the books of John and Samuel Greenhow of Richmond, of which house I was a partner, and made the entries in the primary books of that co-partnery at that time, mostly in my own hand.

SAMUEL GREENHOW.

JANUARY 15, 1805.

I do certify, that some time in the year 1789, or 1790, I sold a James river share for twenty-five pounds, the full sum being then paid thereon to the said company.

SAMUEL McCRAW.

CITY OF RICHMOND, *to wit:*

This day, Orris Paine, of lawful age, personally appeared before me, a magistrate for said city, and made oath in due form, that he has been for many years constantly, and to considerable extent, engaged in coal works; that all his coal comes down the river in boats; that he saw two empty boats measured which were of the common form and size, by H. Mosby and John Smith; that each boat drew seven and a half inches of water; that he saw, at the same time a loaded boat measured also, and that, with what he judged not to exceed two hundred bushels of coal, the boat drew one foot and nine inches of water; that he has always considered coal, by accurate measure, to weigh less than eighty pounds weight to the bushel; and that he thinks empty boats in general draw eight inches water; that if the locks were now erected, he would not send his coal down to Rocket's in batteaux to be taken out and deposited there, being convinced that it would cost more to do this, and ship it afterwards, than in the present mode, independent of the risk to be incurred, and which he has no doubt would be considerable, if left upon the wharves; and that he considers the boats fit for the upper navigation are not proper to pass loaded into tide water, even as far as Rocket's.

ORRIS PAINE.

Given under my hand, this 14th day of January, 1805.

GEORGE FISHER.

Amount of produce brought down the canal of James river in the following years, viz:

	Tobacco, hhds.	Wheat, bushels.	Flour, bbls.	Corn, bushels.	Bar iron, tons.	Coal boats.	Cast'gs, tons.	Plank, feet.	Barrel, staves.	Cwt.	Spirits, hhds.	
From Jan. 1, 1804, to Jan. 1, 1805,	13,881	78,687	50,732	25,993	60¾	1,953	31	350	1,200	1,027	140¼	$15,115 24
From Jan. 1, 1805, to Jan. 1, 1806,	15,162	71,382	38,672	6,724	32½	2,110	32¾	-	-	1,026	156¾	16,748 95
From Jan. 1, 1806, to Jan. 1, 1807,	15,160	77,991	37,818	10,814	55½	1,782	31¼	-	6,500	937	124½	14,792 47

The season of 1806 having been uncommonly dry was the cause of the toll for that year being short of the preceding.

C. No. 4.

THE POTOMAC RIVER.

SIR: GEORGETOWN, *January* 20, 1808.

The letter which you did me the honor to address me on the 29th of July last, enclosing copy of a resolution of the Senate of the United States respecting roads and canals, and of several queries on that subject, and asking for detailed information as to the canals and other improvements of the Potomac river, would have been much sooner replied to, but that I have not, until a few days, been able to recover some papers belonging to the files of the Potomac Company, necessary to be referred to on this occasion, which had been loaned to a gentleman in the upper country and mislaid.

I will proceed, sir, by taking the queries in the order in which they have been stated, to detail, in the most accurate manner in my power, such information as I have been able to collect from the documents of the Potomac Company, (all of which the board of directors have given me permission to use,) and from such other sources as come within my reach at this time.

Query 1*st.* Points united by canal, and their distance by said canal.

On the main Potomac in descending—

The first canal is conducted on the right bank of the river and unites the points immediately above and below House's falls; (five miles above Harper's Ferry;) their distance by the canal fifty yards.

The second canal is conducted on the left bank, round the Shenandoah falls; (immediately above Harper's;) distance, by the canal, 1,760 yards.

Third canal, on the right bank, round Seneca falls; (eight miles above the Great falls;) distance by the canal, 1,320 yards.

Fourth canal, on the right bank, unites the points immediately above and below the Great falls; distance, by the canal, including a basin and 5 locks, 1,200 yards.

Fifth canal, on the left bank, unites the point immediately above the Little falls and tide water; distance, by the canal, including 3 locks, 3,814 yards.

On the Shenandoah, a branch of the Potomac, which comes in at Harper's Ferry in descending:

First canal, on the left bank, round Little falls, 8 miles above the junction of the Shenandoah with the Potomac; distance, by the canal, including a basin and 1 lock, 180 yards.

Second canal, on the left bank, round Wilson's upper falls; distance, by the canal, including 1 lock, 730 yards.

Third canal, on the left bank, round Bull's falls; distance by canal, (including a chute,) 300 yards.

Fourth canal, on the left bank, round Wilson's lower falls; distance, by canal, including one lock, 600 yards.

Fifth canal, on left bank, round Saw-mill falls; distance, by canal, including 2 locks, 580 yards.

There are a number of small canals and cuts, which draw off the water of the river partially in different places, not enumerated.

Query 2d. Elevation of the highest ground through which canal passes; descent thence to the two extremities, and number of miles where canal is level.

This inquiry seems to contemplate canals supplied from sources other than the river to be navigated. It may not, however, be improper to state here the difference of level in the several canals enumerated, all of which are supplied by water taken from the river, conducted round falls in said river too rapid for boats to encounter, and returned to it below said falls respectively.

On the main Potomac—

The first canal round House's falls; difference of level, (between the two extremities,) 3 feet.

Second canal, round Shenandoah falls, difference of level, 15 feet.

Third canal, round Seneca falls, difference of level, 7 feet.

Fourth canal, round the Great falls, difference of level, 76 feet 9 inches.

Fifth canal, round the Little falls, and to tide water, difference of level, 37 feet 1 inch.

ON THE SHENANDOAH.

First canal, round Little falls, difference of level between the two extremities, 10 feet 6 inches.

Second canal, round Wilson's upper falls, difference of level, 12 feet 6 inches.

Third canal, round Bull's falls, difference of level, 4 feet.

Fourth canal, round Wilson's lower falls, difference of level, 6 feet 6 inches.

Fifth canal, round Saw-mill falls, difference of level, 17 feet.

Query 3d. Number, dimensions, contents, construction, and situation of locks.

On the Potomac and Shenandoah, there are now 13 locks and 1 basin (on the lock principle) in use, and in good repair.

On the Potomac, at the lower extremity of the canal at the Great falls, 5.

Dimensions.—One, length 100 feet; width 14 feet; lift 10 feet; contents 18,200 cubic feet; construction, rectangular, walled with hewn freestone; sluice gates discharge through the larger gates.

One, length 100 feet; width 12 feet; lift 16 feet; contents 22,800 cubic feet; construction, rectangular, of hewn stone; sluice gates discharge as before described.

One, length 100 feet; width 12 feet; lift 14 feet; contents 20,400 cubic feet; construction as the last.

Two, length 100 feet; width 12 feet; lift 18 feet; contents 25,200 cubic feet each; construction, rectangular, blown out of the solid rock; the natural rock worked tolerably smooth, forming the sides; some mason work being used where the fixtures are inserted for supporting the gates. The sluice gates in these locks, as in several of the others that are deep, do not lift, but are made of cast iron, and turn on a pivot fixed in the centre; so that when the sluice is open, this little gate, or stopper, is turned edgewise to the stream; they work very easy, and are managed in deep locks more readily than those on the ordinary construction.

At tide water, at the canal at the Little falls, 3.

Dimensions.—Length 100 feet; width 18 feet; lift 11 feet; contents 23,400 cubic feet each; construction, of wood, rectangular; sluice gates discharge as described for those at the Great falls.

On the Shenandoah, at Little falls, 1 lock, length 100 feet; width 12 feet; lift 8 feet; contents 13,200 cubic feet; construction, walled with granite, and freestone near the gates, rectangular; sluices discharged through the principal gates; and 1 basin immediately above and adjoining the lock, elliptic, 130 feet from gate to gate, and 150 feet across; lift 2 feet; the upper gate serving as a guard-gate; walled as the lock.

At Wilson's upper falls, 1 lock, length 100 feet; width 12 feet; lift 12 feet; contents 18,000 cubic feet; construction as the last.

At Wilson's lower falls, 1, length 100 feet; width 12 feet; lift 6 feet; contents 10,800 cubic feet; construction as the last.

At Saw-mill falls, 2, one of which, length 100 feet; width 12 feet; lift 9 feet; contents 14,400 cubic feet; the other of same length and width; lift 8 feet; contents 13,200 cubic feet; construction of these, same as the last described.

To the 4th query, as it appears to relate entirely to canals, supplied otherwise than those on the Potomac, there seems to be here nothing to reply.

Query 5th. Designation of such parts of the route, where the natural or improved bed of rivers is used.

The natural or improved bed of the main Potomac river, and of its branches, the Shenandoah, the Conegocheague, and the Monocasy, are now used, except such parts of the main Potomac and Shenandoah as are intersected by the canals already described; that is to say:

Of the main Potomac from Savage river to tide water: distance by the river, from actual admeasurement, canals included, 218 miles and 350 yards; canals deducted, (to wit: at House's falls, Shenandoah falls, Seneca falls, Great falls, and Little falls,) 213 miles and 1,006 yards.

Of the Shenandoah, from Port Republic to its junction with the Potomac: distance by the river, from estimation attentively made from point to point, canals included, 200 miles; canals deducted, (to wit: at Little falls, at Wilson's upper falls, at Bull's falls, at Wilson's lower falls, at Saw-mill falls,) 198 miles 1,130 yards.

Of the Monocacy, from Pipe creek to its mouth, 40 miles.

Of the Conegocheague, 14 miles above its mouth.

Query 6th. Depth and breadth of canal; burden of vessels; breadth of towing paths—

The principal canals, viz. on the Potomac at the Great falls and Little falls, are 6 feet deep, 25 feet broad at top, and 20 feet at bottom; the other canals on the Potomac and Shenandoah are from 16 to 20 feet wide, and 4

to 5 feet deep. Burden of the boats which navigate the Potomac and its branches, average 10 tons; breadth of towing paths, where they are carried on walls, from 4 to 6 feet; when on the land, from 8 to 10 feet.

Query 7th. Aqueducts across valleys or rivers; tunnels through hills; bridges across the canal.

Of aqueducts or tunnels, there are none; of bridges, none of any note, although there are several across the different canals, substantial, though rough, on which wagons and other carriages pass.

Query 8th. Particular obstructions or difficulties surmounted, or to be encountered.

The extent of the navigable waters of the Potomac, above tide water, is, by actual survey on the main Potomac, by what is called the north branch as before stated, 218 miles, 350 yards. By estimation: on the Conegocheague, 24 miles; the Monocasy, 40 miles; Patterson's creek, 20 miles; the South Branch, 100 miles, the Cape Capeon, 20 miles; the Opecon, 25 miles; the Shenandoah, from Port Republic to its mouth, 200 miles; on the north fork, (which branches at 60 miles from the mouth,) by Stover's town, 60 miles. It is further believed the navigation may, one day, be extended from Port Republic, by the middle fork, to the mouth of Lewis's creek, 20 miles, and within 6 miles of Staunton, and thence, by Lewis's creek, to Staunton.

On all this vast extent of interior navigation, stretching, in different directions, through a fertile and well cultivated country, the greatest obstructions and difficulties have been surmounted, to wit: the conducting by canals, and locking the water round the principal falls, as before particularly described; and the reducing to a regularly inclined plane, by canals, the water round the lesser falls. Much has been done from Savage river to tide water on the main Potomac; and, on the Shenandoah, from the first fork downwards, a distance of 60 miles; on the Monocasy, from Pipe creek to its mouth, 40 miles; on the Conegocheague, near its mouth, and improving the bed of the river by blowing rocks, by running wing walls to collect the water; by making cuts on either side, which draw the water partially from the river into better channels, and, by erecting cradles or chutes, to pass boats.

Nothing has yet been done on the upper part of Conegocheague; on Patterson's creek; on the South branch; on Cape Capeon; on Opecon; or on the Shenandoah above the Great Fork.

On all these the bed of the river remains to be improved; and it is further proper to say, that, in many places where much labor has already been expended to improve the bed of the river, considerable work yet remains to be done, to make it well capable of navigation in times of low water. The locking and canaling requisite for locks, are every where executed; unless it may be found at a future day, that, at the Shenandoah falls, on the Potomac, one or two locks would be useful, as the fall in the canal at that place is considerable, and, to ascending boats, presents some difficulty.

On the Shenandoah, a river remarkably well suited to navigation, as, from its mouth to Port Republic, (200 miles,) it preserves nearly an equal width, and the fall, for this whole extent, is estimated to be not more than 435 feet; that is to say:

From Port Republic to Hawk's Bill, 80 miles, fall - - - -	175 feet.
From Hawk's Bill to the Great Fork, 60 miles, fall - - - -	95
From Great Fork to Little falls, 52 miles, fall - - - -	85
From Little falls to the mouth of the river, 8 miles, fall - - -	80
	435 feet.

This estimation, both of distances and falls, is believed to be nearly accurate, as it was done by a judicious man, Mr. Leonard Harbaugh, sent in a boat for the purpose, by the Potomac Company, in the summer of 1805, from Harper's Ferry to Port Republic, and by him noted from point to point. No actual survey or level of that river has yet been taken. All the locking and canaling necessary, from the little falls downwards (eight miles) being finished, but little remains to be done.

On the Potomac, as the fall is more considerable, a perfect improvement of the bed of the river will be more difficult. By actual survey and admeasurement, made in the year 1789, by Colonel George Gilpin and Mr. James Smith, for the Potomac Company, from the mouth of Savage river to Cumberland; distance, by the river, 30 miles 2 quarters and 13 perches; the fall was found to be 445 feet. And from Fort Cumberland to tide water, distance 187 miles 2 quarters and 50¾ perches; fall, 715 feet 7¼ inches. But, for more particular information on this head, a copy of their works is sent, herewith, (marked A,) showing the distances and falls, from point to point, through the whole extent of the river.

Query 9th. Defects either in the plan or execution, and the proposed remedies.

Many errors of minor importance were, no doubt made in the commencement and prosecution of this great work; and not a little money was lost, for the want of the necessary practical knowledge in its early stages, as it was the first work of the kind undertaken in this part of the country. Most of these, however, were gradually remedied by experience, and it is believed that no material defect remains to be cured, but in two instances. The first, in the construction of four of the locks; three of these were constructed of an improper material, *wood;* and all the four made larger than requisite, thereby not only having gone to a greater expense in the construction than was necessary, but being constantly taxed with a loss of time and water in filling them.

The three locks at the Little falls of the Potomac were the first executed; they were made eighteen feet wide, and of wood. The next which was finished was the upper lock at the Great falls; this was made fourteen feet wide. A little further experience satisfied the directors of the company that the width of twelve feet was sufficient for any vessels that would navigate this river, and so were formed all that followed. The remedy in this case, as to the upper lock at the Great falls, was soon applied; its greater capacity, aided by an adjoining basin, was made to serve to fill more readily the lower locks. At the Little falls the remedy to both defects, the materials and dimensions, is yet to be applied. It is proposed, when the wood decays, to rebuild of granite, (of which there is a quarry of excellent quality on the canal just above, belonging to the company, reserved for the purpose,) and then to contract them to twelve feet in width. In the next instance, it is now thought that, in the labor applied on the bed of the river, too much has been done in removing rocks, and that obstructions to the passing off of the water have sometimes been mistaken for obstructions to navigation. It is proposed, in such places as will admit of that mode of improvement, to erect a series of small, cheap dams across the river, thereby to back the water from station to station, and to leave such falls, generally, as a boat's crew will readily push or haul up against in ascending; and as will not be dangerous in descending. It is also believed that, in the progress of the improvement of the bed of the river, it will be found best, in many places, to cut additional small canals on either side, through the land, round the more considerable obstacles.

Query 10th. Estimate of the tonnage of vessels; species, weight, and value of the articles commonly conveyed by the canal; expense of carriage by canal, compared with land or river carriage before canal was made; time employed in navigating through the whole canal.

There are, at this time, navigating the Potomac and Shenandoah, boats equal in burden to about 800 tons; but it is to be remarked, that the last season having been the first that the Shenandoah was open, there were then no boats on that river; a few only were built during that year; many are now preparing; and, it is estimated, that for the next season, the tonnage will amount to at least 1,200 tons.

The species, weight, and value of the articles annually conveyed by the river and canals, are detailed in the papers annexed, marked B, C, D, E, F, G, H, I, commencing with the 1st of August, 1799, and terminating on the 1st of August, 1807.

The expense of carriage, by the river above tide water, compared with land carriage, rated on a barrel of flour, and taken from three principal points, viz: Cumberland, Williamsport, and Harper's Ferry, stand, as nearly as may be, thus: From Cumberland, by land, $2 25; by water, including tolls, $1 30; from Williamsport, by land, $1 50; by water, including tolls, $1; from Harper's Ferry, by land, $1 50; by water, including tolls, $1.

It is to be observed, however, that the rates by water are notoriously too high at this time; and that there are fewer boats now on the river than are requisite for the business; that, when their number shall be increased, and the bed of the river be further improved, the carriage by water will be reduced from 33⅓ to 50 per cent.

In navigating from Savage river to tide water, there are employed three to four days. From tide water to Savage river, six to seven days; from Harper's Ferry (mouth of Shenandoah,) to tide water, one to one and a half days; from tide water to Harper's Ferry, three to three and a half days.

Query 11*th*. Capital already expended, vested, or wanted for completing the work.

The sum already expended in this work, (commenced in 1784,) including interest on loans, amounts, at this time, to $444,648 89.

The capital stock, or the stock on which dividends are to be made, is composed of—

500 shares, created by the original incorporating acts of Virginia and Maryland, in 1784.
100 shares, created in 1796.
130 shares, created in 1798.

730
29 of which have been bought in, from delinquent subscribers, by the directors of the company.

701 shares, at $444⅘, - - - - - - - - $311,555⅝

Of which shares, the State of Maryland holds - - - - - - -	220
Of which shares, the State of Virginia holds - - - - - - -	70
Subscribed and paid by the State of Virginia, presented to General Washington, and by him bequeathed towards the endowment of a university, to be established within the limits of the District of Columbia,	50
Held by individuals, - - - - - - - - -	361
	701

The difference between the amount of the capital stock, and of the sum expended, is to be found, first, in interest received on instalments of the capital stock, where delays in payment occurred equal to $3,458 84; secondly, in an advance received on the second and third subscriptions of capital stock, in 1796 and 1798, stipulated with the new subscribers as a compensation, in the nature of interest, to the old subscribers for the time that their money had been previously invested, equal to $24,094 83; thirdly, in the employment of all the tolls received from the commencement, except the sum of $3,894 10, (divided in the year 1803,) and $7,146 42 cash on hand on the 1st of August, 1807, the day to which these statements are made up, equal to $38,724 77; and, lastly, in the present debt of the company, equal to $66,814 90, of which due to individuals residing near, and interested in the navigation of the river and dischargeable in tolls, $2,309 66.

As to "capital wanted for completing the work," it is estimated by the Board of Directors of the Potomac Company, that the sum of $100,000 may be requisite, in addition to what has been expended, effectually to render navigable, in times of the lowest water, the Potomac, and all the branches thereof, heretofore enumerated, from the highest points contemplated to tide water.

Query 12*th*. Expenses per mile, or in the whole, and, as far as practicable, of every component part of the work in all its details.

No detailed accounts have been kept by the company, except as relates to the separation of the expenditures, on the main Potomac and on its several branches. From these it appears, proportioning the contingent expenses as near as may be, that there have been expended, on the main Potomac, $375,648 89; on the Shenandoah, $65,000; on the Monocasy, $3,500; on the Conegocheague, (in inserting a chute near its mouth,) $500.

Query 13*th*. Rate and gross amount of tolls; annual expenses of repairs and contingencies; annual net income.

The rate of tolls will be fully shown by the paper K for the main Potomac, and by the paper L for the Shenandoah. The gross amount, from the commencement of their reception, in the year 1799, 1800, has been as follows:

For the year ending on 1st August, 1800, - - - - - -	$2,138 50
For that ending on 1st August, 1801, - - - - - - -	4,210 19
For that ending on 1st August, 1802, - - - - - - -	3,479 69
For that ending on 1st August, 1803, - - - - - - -	9,353 93
For that ending on 1st August, 1804, - - - - - - -	7,665 58½
For that ending on 1st August, 1805, - - - - - - -	5,213 24
For that ending on 1st August, 1806, - - - - - - -	2,123 69½
For that ending on 1st August, 1807, - - - - - - -	15,080 42

The work not being completed, it is difficult to estimate the annual repairs. It is supposed, however, that they cannot exceed $2,000 per annum. The contingent expenses, including salaries to clerks and toll-gatherers, hire of laborers to attend lock-gates, compensation to the treasurer, and a per diem allowance to the president and directors, when actually on duty, average $3,000. It is believed, then, that the annual expenses of repairs and contingencies may, when the whole of the work shall have been completed, be estimated at $5,000 per annum.

Of annual net income, there has, as yet, been none since the stockholders have constantly directed the amount of tolls received to be reinvested; that is to say, employed in furthering the improvement of the navigation; except in one instance: in the summer of 1803, when they owed no money, had a surplus in hand, had not then obtained the charter for the Shenandoah, and believed that, as related to the main Potomac and its smaller branches, they

might, with the tolls accruing, continue to give to the gradual improvement of the bed of the river, a reasonable sum annually, and yet divide, from time to time, in about the same proportion. They made a small dividend of $5 55 per share. During the winter following, the Legislature of Virginia granted them the charter for the Shenandoah; since when, it has been judged by the stockholders better to withhold all the tolls, and to borrow money, than to create new stock for the purpose of opening that river. What the annual income will be, at a future day, taking into consideration the vast extent and fertility of the country watered by these streams, may be well conjectured from the data now furnished, though, perhaps, it is not proper here to attempt an estimate.

Query 14th. Substance of charters and acts of Legislatures on the subject.

The original acts of the Legislatures of Virginia and Maryland, incorporating the Potomac Company, passed during their respective sessions of the winters of 1783 and 1784, they are verbatim the same; and by them it is provided that the capital stock of the company then authorized, should consist of 500 shares of 444\frac{4}{9}$ each, making $222,222$\frac{2}{9}$; with power, from time to time, to increase the said capital, by the addition of so many more whole shares as may be judged necessary by the proprietors, or a majority of them, holding at least three hundred shares, present at any general meeting of the company. That the business and concerns of the company shall be managed by a president and four directors, appointed for a term not exceeding three years, and who shall take an oath, faithfully to execute the duties of the office, with power to appoint a treasurer, clerk, and other officers, and, generally, to conduct their affairs in and during the intervals between general meetings of said company. That there shall be a general meeting of the stockholders on the first Monday of August in every year. That the presence of proprietors, holding one hundred shares at least, shall be necessary to constitute such a meeting, to which the president and directors shall make report, and render distinct and just accounts of all their proceedings; and, if found fairly and justly stated, record thereof to be made on the company's books. That at such yearly meetings, dividends of nett profits arising from the tolls may, in the judgment of those holding a majority of the shares present, be ordered to be paid. That, in the appointment of president and directors, and in transacting all business of general meetings, each member shall be allowed one vote for every share as far as ten, and one vote for every five shares above ten, held respectively at the time. That proprietors may vote by proxy duly authorized in writing. That, in case of delinquency in payment of any instalment on shares called for, the president and directors have power to sell at auction such delinquent share; and if the amount of sale be not sufficient to satisfy the amount then unpaid thereon, and the charges of sale, to sue for, and recover of the original proprietor such balance. That the president and directors have power to agree with the owners of any lands, through which the canals, locks, or other works may be intended to pass, not exceeding 140 feet in width, or for any quantity not exceeding one acre, at each of the toll places, for erecting the necessary buildings; and in case of disagreement, or inability, or absence from the State of the owner, a jury shall be empannelled to describe and value such land, and all damages to be sustained by the proprietor; and, on payment of such valuation, the company shall be seized in fee of such land, as if to them and their successors conveyed by the owner. That the water conveyed through any canal or cut made by the company shall not be used by them for any purpose but for navigation, unless with the consent of the proprietor of the land through which the same shall be led. That transfers of shares shall be made only by deed executed before two witnesses, and registered on the company's books; and by devise, which shall be exhibited to the president and directors, and registered in like manner, before it can take effect.

That the said canals, locks, and other works, with all their profits, are vested in the said proprietors, their heirs, and assigns forever, as tenants in common, in proportion to their respective shares; and that the same shall be deemed real estate, and be forever exempt from payment of any tax, imposition, or assessments whatever; and that it shall and may be lawful for the said president and directors at all times forever thereafter, to demand and receive tolls for all commodities transported through either of them, at or near the places, and according to the rates as specified. (See paper K.) That the proprietors, or a majority of them, holding at least three hundred shares, in general meeting convened, have power to lessen any of the said tolls, or to determine that any article may pass free of toll. That, in case of refusal to pay the tolls, the collector may restrict the passage of any vessel so refusing; and if any pass without paying the tolls, then the collector may seize such vessels wherever found and sell her at auction to satisfy said toll; and if such sale produce not enough to satisfy the tolls due, the person having the direction of such vessel to be liable for the deficiency.

That the said river, and the works to be erected thereon, when completed, shall forever thereafter be esteemed, and taken to be navigable, as a public highway, free for the transportation of all produce and goods, on payment of the tolls so imposed, and that no other toll or tax for the use of the waters thereof, shall, at any time thereafter, be imposed by both or either of the States of Virginia or Maryland; and that all the commodities, of the produce of either of the said States, or of the Western country, which may be carried or transported through the said locks, canals, and river, may be landed, sold, or otherwise disposed of, free from any other duties, regulations, or restrictions, of any kind, than the like commodities of the produce of the State, in which the same may happen to be so landed, sold, shipped, or disposed of.

By acts of the State since passed, foreigners are made capable of holding stock in the company. And all fish-dams and other obstructions to navigation in the Potomac or its branches above tide water are declared nuisances. Any person is at liberty to remove such obstruction, and a fine of fifty dollars for every offence, recoverable in any court or record, is imposed on those in any way concerned in making or keeping up such obstructions.

By acts of the Virginia Legislature, passed in 1802 and 1803, the charter to open the river Shenandoah and its branches was granted to the Potomac Company, whereby all the canals and works which they may make and erect on said river and branches, with their profits, are vested in the stockholders of the Potomac Company, their heirs and assigns forever, as tenants in common, in proportion to the shares held by them respectively, on the same terms and conditions as before provided for said company, as relates to the Potomac river, and with the same right, in case of nonagreement or disability, to have a jury summoned to condemn land necessary for their works, &c.; and they are authorized to demand and receive at such place on the Shenandoah, as they shall think proper, the tolls or rates specified in the paper L, hereunto annexed, and the said tolls are secured to the company forever, in same manner as those on Potomac were secured to them by the Legislatures of Virginia and Maryland. And the president and directors are empowered, if they deemed it necessary, to increase the capital of the company, by opening books and receiving subscriptions for one hundred shares, additional to those then held by them, at the rate of one hundred and forty-five pounds sterling each, which, being paid, the respective subscribers to be deemed members of the said company, and entitled to receive their full dividends and proportions of the tolls therein mentioned.

With an earnest hope that I have noticed every thing material contemplated in the queries propounded, and with very great respect, I have the honor to be,

Sir, your very obedient servant,

J. MASON.

The Hon. ALBERT GALLATIN, Esq., *Secretary of the Treasury.*

A.

The different falls in the Potomac river levelled, and the distance of the river surveyed by Colonel Geo. Gilpin and James Smith, in July and August, 1789; *beginning at the mouth of Savage to Shenandoah Falls; and from Shenandoah Falls, to tide water, below the Little Falls, by James Smith, at different times, viz:*

	Miles.	Quarters.	Perches.	Feet & inches fall.
From the mouth of Savage to the mouth of George's creek,	2	-	63	61 5½
From the mouth of George's creek to the mouth of New creek,	5	3	50	129 2½
From the mouth of New creek to Fort Cumberland,	22	1	60	254 4
From Fort Cumberland to Evitt's creek,	4	2	5	34 2
From Evitt's creek to the road on the river side from Cumberland,	7	-	39	33 3
From where the Cumberland road joined the river to Patterson's creek,	1	2	27	6 0
From Patterson's creek to Mr. Wm. Moore's,	2	3	7	15 0
From Mr. Wm. Moore's to Mr. Joseph Spriggs, Old Town,	4	-	49	11 9
From Mr. Joseph Spriggs' to the mouth of South Branch,	1	3	15	6 1
From the mouth of South Branch to Town creek, on Mr. Greg's,	2	2	44	13 7
From Mr. Greg's to Mathias Brant's,	4	-	77	25 0½
From Math. Brant's to the lower end of the Tumbling Dam's Falls,	6	3	41	35 1
From the Tumbling Dam's Falls to the lower end of the Bear's Falls,	-	3	32	00 0
From the lower end of the Bear's Falls to Mr. David Mitchell's house,	4	1	72	16 6
From Mr. Mitchell's house to General Washington's bottom,	5	3	42	23 1½
From General Washington's bottom to Fifteen Mile creek,	4	3	30	13 11
From Fifteen Mile creek to Sideling Hill creek,	4	1	39	14 1½
From Sideling Hill creek to Great Cape Capon,	2	2	10	13 6½
From the mouth of Great Cape Capon to the Little Conalaway creek,	8	-	67	27 9½
From the mouth of Little Conalaway creek to Hancock town,	-	2	3	00 6
From Hancock town to Great Conalaway creek,	-	3	4	00 0
From Great Conalaway creek to Licking creek,	6	-	48	24 6
From Licking creek to opposite Fort Frederick, on Back creek,	4	1	24	17 6
From Fort Frederick on Back creek to the lower end of Garrison's Falls,	1	1	36	4 10
From the lower end of Garrison's Falls to Boyd's Ferry,	1	-	48	00 0
From Boyd's ferry to the mouth of Little Conegocheague,	6	2	6	23 2½
From Little Conegocheague, or Caroner's mill, to the mouth of Great Conegocheague,	5	3	24	25 1
From the mouth of Great Conegocheague to the mouth of Opecking,	8	3	8	48 3½
From the mouth of Opecking to Shepherdstown,	17	1	24	35 9
From Shepherdstown to the head of Shenandoah Falls, just below Keep Tryste furnace,	10	-	52	22 2
From the head of Shenandoah Falls to the lower end of the islands at Payne's Falls,	5	1	53	43 1¼
From the lower end of the islands at Payne's Falls to the head of Seneca Falls,	32	-	8	13 9½
From the head of Seneca Falls to Broad Run,	2	1	19	15 0
From the mouth of Broad Run to the Great Falls, at the mouth of the canal,	5	3	26	9 9
The fall at the Great Falls,	-	-	-	76 9
From the head of the canal at the Great Falls to the head of the canal at the Little Falls,	9	2	36½	29 4
Fall at the Little Falls,	-	-	-	37 1
The length of the canal at the Little Falls,	2	2	75½	
Total,	218	-	63¾	1,160 7¼

Rise of the Allegany mountain, from the mouth of Savage river, which is 8¾ miles to its summit, at Moses Williams's, is 2,097 feet 6½ inches perpendicular.

B.

Statement of sundry kinds of produce which descended the river Potomac, between the 1st *day of August,* 1799, *and the* 1st *of August,* 1800, *with their estimated value.*

	Value in dollars.	Am'nt of tolls taken thereon.
16,585 barrels of flour, at 7 dollars per barrel,	116,095	
46 barrels of pork, at 15 dollars per barrel,	690	$1,891 75
84 barrels of whiskey, at 18 dollars per barrel,	828	
25 hogsheads of tobacco, at 40 dollars per hogshead,	1,000	
Flax seed, hemp, butter, potash, dry and wet goods, &c. &c.	10,801	246 75
Total,	129,414	2,138 50

The weight of the above articles estimated at 1,643 tons.

C.

Statement of sundry kinds of produce which descended the river Potomac, between the 1st day of August, 1800, and the 1st of August, 1801, with their estimated value.

	Value in dollars.	Am'nt of tolls taken thereon.
100 hogsheads of tobacco, at 40 dollars per hogshead,	4,000 00	
28,209 barrels of flour at 10 dollars per barrel,	282,090 00	
619½ barrels of whiskey, at 18½ dollars per barrel,	11,461 00	
40 barrels of pork, at 15 dollars per barrel,	600 00	
17 barrels of bacon, at 16½ dollars per barrel,	286 00	
23 barrels of fish, at 4½ dollars per barrel,	103 50	
14 barrels of oil, at 32 dollars per barrel,	448 00	1,111 21
2 barrels of potash, at 35 dollars per barrel,	70 00	
33 barrels of lime, at 1 54 cents per barrel,	50 82	
30½ tons of bar iron, at 105 dollars per ton,	3,208 50	
157 tons of pig iron, at 37½ dollars per ton,	5,887 50	
Ship-timber, corn meal, fruit, flax, &c.	14,060 00	
Sundry articles up the river,	3,370 00	53 77
Cord wood, &c. at the Little Falls,	2,810 00	45 21
Total,	328,445 32	$4,210 19

The weight of the above articles estimated at 2,993 tons.

D.

Statement of sundry kinds of produce which descended the river Potomac, between the 1st day of August, 1801, and the 1st of August, 1802, with their estimated value.

	Value in dollars.	Am'nt of tolls taken thereon.
5 hogsheads of tobacco, at 50 dollars per hogshead,	275 00	
17,253 barrels of flour, at 7½ dollars per barrel,	129,397 50	
379 barrels of whiskey, at 18½ dollars per barrel,	7,011 00	
120 barrels of pork, at 15 dollars per barrel,	1,800 00	
16 barrels of butter, at 21½ dollars per barrel,	344 00	
700 bushels of corn, at 60 cents per bushel,	420 00	
224 bushels of lime, at 44 cents per bushel,	98 56	3,479 69
28½ tons of bar iron, at 105 dollars per ton,	2,940 00	
210 tons pig iron and castings—pig iron 37½ dollars per ton, castings 120 dollars,	11,170 00	
850 pounds of hemp,	85 00	
4,800 pounds of bacon, at 11 cents per pound,	528 00	
Ship timber, scantling, flax seed, firewood, &c.	9,847 00	
Total,	163,916 06	$3,479 69

The weight of the above articles estimated at 1,952 tons.

E.

Statement of sundry kinds of produce which descended the river Potomac, between the 1st day of August, 1802, and the 1st of August, 1803, with their estimated value.

	Value in dollars.	Am'nt of tolls taken thereon.
32 hogsheads of tobacco, at 60 dollars per hogshead,	1,920 00	
45,055 barrels of flour, at 6 dollars per barrel,	270,330 00	
92 barrels of pork, at 15 dollars per barrel,	1,380 00	
575 barrels of whiskey, at 18 dollars per barrel,	10,350 00	
79 kegs of butter, at $9 60 per keg,	766 66	
75¼ tons of bar iron, at 105 dollars per ton,	7,927 50	9,077 18
405 tons of pig iron and castings—pig iron 37½ dollars per ton, castings 120 dollars,	19,725 00	
4,382 bushels of wheat, at $1 13 per bushel,	4,951 66	
69 boat loads of ship timber,	13,800 00	
Flax seed, hemp, lime, cider, &c.	3,936 00	
Articles up the river—say fish, groceries, &c.	10,386 00	276 75
Total,	345,472 82	$9,353 93

The weight of the above articles estimated at 5,549 tons.

F.

Statement of sundry kinds of produce which descended the river Potomac, between the 1st *of August,* 1803, *and* 1st *of August,* 1804, *with their estimated value.*

	Value in dollars.	Am'nt of tolls taken thereon.
8 hogsheads of tobacco, at 60 dollars per hogshead,	480 00	
39,350 barrels of flour, at 6½ dollars per barrel,	255,775 00	
164 barrels of pork, at 16 dollars per barrel,	2,624 00	
578 barrels of whiskey, at $19 20 per barrel,	11,097 60	7,665 58½
88 tons of pig iron, at 37½ dollars per ton,	3,300 00	
Ship timber, hemp, flax, corn, potash, &c.	10,764 00	
Total,	284,040 60	$7,665 58½

The weight of the above articles estimated at 3,823 tons.

G.

Statement of sundry kinds of produce which descended the river Potomac, between the 1st *day of August,* 1804, *and* 1st *day of August,* 1805, *with their estimated value.*

	Value in dollars.	Am'nt of tolls taken thereon.
11 hogsheads of tobacco, at 50 dollars per hogshead,	550 00	
28,507 barrels of flour, at 10½ dollars per barrel,	299,323 50	
17 barrels of beef, at 12 dollars per barrel,	204 00	
14 barrels of pork, at 16 dollars per barrel,	224 00	
436 barrels of whiskey, at $18 25 per barrel,	7,957 00	
17 kegs of butter, at $9 60 per keg,	307 20	5,055 37
32 tons of bar and pig iron, at 105 dollars and 37½ dollars per ton,	2,554 00	
5,688 bushels of corn meal, at 66 cents per bushel,	3,754 08	
340 bushels of flax seed, at 1 dollar per bushel,	340 00	
340 bushels of lime, at 46 cents per bushel,	156 40	
Ship timber, hemp, potash, &c.	15,813 00	
Sundry articles up the river,	7,486 00	114 63½
Cord wood, &c. at the Little Falls,	1,665 00	43 23½
Total,	340,334 18	$5,213 24

The weight of the above articles estimated at 3,208 tons.

H.

Statement of sundry kinds of produce which descended the river Potomac, between the 1st *of August,* 1805, *and* 1st *of August,* 1806, *with their estimated value.*

	Value in dollars.	Am'nt of tolls taken thereon.
5 hogsheads of tobacco, at 60 dollars per hogshead,	300 00	
9,079 barrels of flour, at 6½ dollars per barrel,	59,013 50	
459 barrels of whiskey, at 17 dollars per barrel,	7,703 00	
40 bushels of corn, at 66 cents per bushel,	26 40	1,741 81½
20½ tons of pig iron and castings—pig iron 37½ dollars, castings 120 dollars per ton,	1,222 50	
Ship timber, bacon, lard, rye, clover seed, &c.	10,803 00	
Sundry articles up the river,	4,998 00	123 00½
Cord wood, &c. at the Little Falls,	2,724 00	58 87½
Total,	86,790 40	$2,123 69½

The weight of the above articles estimated at 1,226 tons.

I.

Statement of sundry kinds of produce which descended the river Potomac, between the 1st of August, 1806, and 1st of August, 1807, with their estimated value.

	Value in dollars.	Am'nt of tolls taken thereon.
20 hogsheads of tobacco, at 50 dollars per hogshead,	1,000 00	
85,248 barrels of flour, at 6 dollars per barrel,	511,488 00	
971 barrels of whiskey, at 16 dollars per barrel,	15,536 00	
66½ barrels of pork, at 17 dollars per barrel,	1,130 50	14,860 78
70 bushels of wheat, at $1 18 per bushel,	82 60	
33 tons of bar iron, at 105 dollars per ton,	3,465 00	
2¼ tons of pig iron, at 37½ dollars per ton,	84 37	
Ship timber, mill stones, clover seed, rye, &c.	10,686 00	
Sundry articles up the Potomac and Shenandoah,	7,314 00	195 76
Cord wood, &c. at the Little Falls,	1,110 00	23 89
Total,	551,896 47	$15,080 42

The weight of the above articles estimated at 8,155 tons.

K.

Table of Tolls.

	TOLLS IN STERLING MONEY, AS ESTABLISHED BY LAW.						SAME TOLLS REDUCED TO THE CURRENCY OF THE UNITED STATES.		
	At or near the mouth of Conegocheague.		At or near Hooke's Falls.		At the Great Falls.		At or near the mouth of Conegocheague.	At or near Hooke's Falls.	At the Great Falls.
	Shil.	Pence.	Shil.	Pence.	Shil.	Pence.	Dolls. Cts.	Dolls. Cts.	Dolls. Cts.
Every pipe or hogshead of wine containing more than 65 gallons,	1	6	1	6	3	0	33 18-54	33 18-54	66 30-54
Every hogshead of rum or other spirits,	1	3	1	3	2	6	27 42-54	27 42-54	55 30-54
Every hogshead of tobacco,	1	0	1	0	2	0	22 12-54	22 12-54	44 24-54
Every cask between 65 and 35 gallons, one half of a pipe or hogshead; barrels one fourth part; and smaller casks or kegs in proportion according to the quality and quantity of their contents of wine or spirits.									
For casks of linseed oil the same as spirits.									
Every bushel of wheat, peas, beans, or flax seed,		½		½		1	50-54	50-54	1 46-54
Every bushel of Indian corn, or other grain, or salt,		¼		¼		½	25-54	25-54	50-54
Every barrel of pork,		6		6	1	0	11 6-54	11 6-54	22 12-54
Every barrel of beef,		4		4		8	7 22-54	7 22-54	14 44-54
Every barrel of flour,		3		3		6	5 30-54	5 30-54	11 6-54
Every ton of hemp, flax, potash, bar, or manufactured iron,	2	6	2	6	5	0	55 30-54	55 30-54	1 11 6-54
Every ton of pig iron and castings,		10		10	1	8	18 28-54	18 28-54	37 2-54
Every ton of copper, lead, or other ore, other than iron ore,	2	0	2	0	4	0	44 24 54	44 24-54	88 48-54
Every ton of stone or iron ore,		5		5		10	9 14-54	9 14-54	18 28-54
Every hundred bushels of lime,	1	3	1	3	2	6	27 42-54	27 42-54	55 30-54
Every chaldron of coals,		5		5		10	9 14 54	9 14-54	18 28-54
Every hundred pipe staves,		2½		2½		4½	4 9-54	4 9-54	8 18-54
Every hundred hogshead staves, or pipe or hogshead heading,		1½		1½		3	2 42-54	2 42-54	5 30-54
Every hundred barrel staves, or barrel heading,		1		1		2	1 46-54	1 46-54	4 38-54
Every hundred cubic feet of plank or scantling,		10		10	1	8	18 28-54	18 28-54	37 2-54
Every hundred cubic feet of other timber,		5½		5½		11	10 10-64	10 10-54	20 20-54
Every gross hundred weight of all other commodities or packages,		1½		1½		3	2 42-54	2 42-54	5 30-54
And every empty boat or vessel, which has not commodities on board to yield so much, except an empty boat or vessel returning, whose load has already paid at the respective places the sums affixed at each, in which case she is to repass toll free,	2	6	2	6	5	0	55 30-54	55 30-54	1 11 6-54

NOTE.—At the Little Falls a conditional toll, at the same rates as at Conegocheague, is also payable by law, viz: on articles in descending, not having passed the Great Falls; and in ascending, on such as are not destined to pass said Great Falls.

L.

The tenth clause of an act, entitled "An act for opening and extending the navigation of Shenandoah river," passed January 23, 1798.

It shall and may be lawful for the said president and directors, at all times forever hereafter, to demand and receive, at Little Falls on the said river, or any place below the same falls which the president and directors, or a majority thereof, shall fix upon for that purpose, the following tolls or rates, that is to say:

	Dolls.	cents.
For every pipe or hogshead of wine containing more than sixty-five gallons,		66
For every hogshead of rum or other spirits,		55
For every hogshead of tobacco,		44
For every cask between sixty-five and thirty-five gallons, one-half of a pipe or hogshead, barrels one-fourth part, and smaller casks or kegs in proportion, according to the quality and quantity of their contents of wine or spirits.		
For casks of linseed oil the same as spirits.		
For every bushel of wheat, peas, beans, or flaxseed,		2
For every bushel of corn or other grain, or salt,		1
For every barrel of pork,		22
For every barrel of beef,		15
For every barrel of flour,		11
For every ton of hemp, flax, pot-ash, bar or manufactured iron,	1	10
For every ton of pig-iron or castings,		40
For every ton of copper, lead, or other ore, other than iron ore,		90
For every ton of stone or iron ore,		20
For every hundred bushels of lime,		55
For every chaldron of coals,		20
For every hundred of pipe staves,		9
For every hundred hogshead staves, or pipe or hogshead heading,		6
For every hundred barrel staves or barrel heading,		4
For every hundred cubic feet of plank or scantling,		40
For every hundred cubic feet of other timber,		22
For every gross hundred weight of all other commodities and packages,		6
For every empty boat or vessel which has not commodities on board to yield so much, except an empty boat or vessel returning, whose load has already paid, at the aforesaid place, the sum fixed, in which case she is to repass toll free,	1	10

Which tolls may be discharged in dollars and cents, or other coins made current by law.

NOTE. The charter to the Potomac company for the Shenandoah was not granted until the year 1803. The act of the Virginia Legislature, referred to above, of 1798, was in the nature of a charter to a proposed company, which was never made up; and, in the charter to the Potomac company, the tolls intended to have been such to the proposed company were given to the Potomac company, by reference to the act of 1798.

C. No. 4.

Answers to certain queries respecting the Appamattox Canal.

To Query 1st. The highest point up the Appamattox river, to which a batteau can be carried, is more than eighty miles above Petersburg, by the nearest road for a wagon, and that road, passing through a hilly country, where loaded wagons have much difficulty in getting along in the winter. The distance by water is probably double that by land. Of this distance the canal will occupy somewhat more than five miles; and besides this, and for more than five miles above the spot where the water enters the canal, there are obstructions from rocks and rapids, which have occasioned sluices to be formed at considerable expense, through which batteaux pass, with safety and facility, with such loads as they can carry in other parts of the river. When the river is ascended twelve miles above Petersburg, few or no obstructions are met with; there are, indeed, a few rocks, and some ledges of rocks, and a considerable number of old trees, which either have been, or may be, removed, without very great expense to the company.

Query 2d. The highest ground through which the canal passes is the spot where the water is taken out of the bed of the river. It is thrown into the canal by a low dam across a part of the river. The elevation of this spot above the highest ground in Petersburg is more than thirty feet, and it is believed one hundred feet above the level of tide water.

Query 3d. The locks are just beginning, and it will be necessary for the company to build three, perhaps four, to bring the water low enough for the place where it is proposed to have a basin. The dimensions are not exactly recollected, but they are to be built of the least perishable materials, and they will be placed between one and two miles above the basin.

Query 4th. The supply of water is ample as to any purpose of navigating batteaux that can pass in the bed of the river above the canal; and it is also in contemplation to use it, as it passes out of the basin, for mills or other machinery, there being a fall of more than sixty feet from the basin to the place where it will again enter the river. No calculation has been made of the cubic feet of water passing in any given time, although it would be easy for a man on the spot to do it.

Query 5th. Answered in the reply to the first query.

Query 6th. The canal is sixteen feet wide at the top of the water, and about three feet deep. The batteaux are generally constructed to carry from sixty to ninety barrels of flour, or about two hundred and fifty bushels of wheat. There are no towing paths.

Query 7th. The company have spent a considerable portion of their funds in carrying the canal across two considerable valleys, through each of which passes a stream of water and one of them is of a size to make a large tunnel necessary. Over the valley, through which the smallest stream passes, the water is carried on a bank made wholly of earth. Over the other valley, both stone and earth are used, but the work does not appear so permanent and safe as where earth alone was used, although the expense was not lessened as was expected.

Query 8th. The principal difficulty now to be surmounted by the Appamattox company arises from want of money, although their credit has been as yet preserved unimpaired. They have expended nearly 60,000 dollars,

but they have vested about 10,000 dollars of this sum in upwards of thirty negro men, now employed, and skilful as stonemasons, &c. They have yet their locks to build, and to carry their canal through earth only for more than half a mile; they apprehend some difficulty in procuring the necessary sums either by loan or subscription, both of which modes they have resorted to in their exertions to carry on the business.

Query 9th. The superintendents do not doubt of many defects, both in the plan and execution of the work; and they can only say, in extenuation, that they have applied much of their time, and exerted themselves to the utmost, and have never taken a single shilling even to defray their expenses when engaged in forwarding the business of the company.

Query 10th. The batteaux can carry, in a proper depth of water, six tons; perhaps five tons may be considered as the usual load. Tobacco, wheat, and flour are the articles mostly contemplated to come through the canal, although some ideas have been entertained of beds of coal being up the river, and near it. No estimate, at this time, can be formed of the weight or value of the articles that may hereafter be conveyed by the canal. It has been used as yet in a very limited way, because of the difficulty and expense of the portage and storage; but even with these difficulties and restrictions, a considerable quantity of flour has been brought down at a much less expense than it could have been wagoned. The batteaux can pass in four or five days from the highest navigable points of the river to the basin; the river was never used by a batteau before the commencement of the canal.

Query 11th. As was before said, 60,000 dollars have been already expended, and of this there remains, in the hands of the company, only the negroes, which may be estimated fairly at 12,000 dollars. It is probable the work to the basin, as now contemplated, might be completed with 10,000 dollars, and the labor of the hands belonging to the company.

Query 12th. This query cannot be more particularly answered than has already been done.

Query 13th. The rate of tolls is the same as on the James river canal; but no estimate can be made of what they may amount to hereafter. Neither can it yet be ascertained what the expenses of repairs and contingencies may be, as the work is not completed, and few or no parts of it have as yet experienced any decay.

Query 14th. The several acts of the Legislature respecting the Appamattox company give them many rights, and extensive powers, to enable them to carry on and complete the canal, and to fit the river for the purposes proposed; these acts also give the profits arising from the tolls to the shareholders and their successors in perpetuity.

C. No. 5.

SUSQUEHANNAH CANAL.

SIR:

Having seen the resolve passed by the Senate of the United States on the 2d day of March last, I had written to the Secretary of the Treasury, a few days before the receipt of your letter enclosing the same, by which I had in some degree anticipated the inquiry which you now make for the information of the Treasury Department, viz:

1st. Points united by canal, and their distance by said canal.

Answer. The Susquehannah canal commences about one mile below the line which divides the States of Pennsylvania and Maryland, at the upper part or commencement of the Bald Friar falls, and unites the navigation from thence to tide water, which is entirely obstructed by those falls, and the falls called Amos's, for the distance of about nine miles, (say from the top of the wing dam to the lower end of the proposed extension,) except when the river is high.

2d. Elevation of the highest ground through which canal passes; descent thence to the two extremities; and number of miles where the canal is level.

Answer. The entrance of this canal is formed by Love island; the elevation there is fifty-nine feet above tide water, where the obstructions first commence in ascending the river; from Love island the canal passes on a level for the distance of three miles, to Conawingo, where it descends, by two locks, sixteen feet; and from thence passes on a level two miles and a half to Octoraro, where it descends, by three locks, twenty feet; and from Octoraro passes on a level three miles, where it descends, by three locks, twenty-three feet, to the bed of the river at tide water.

3d. Number, dimensions, contents, construction, and situation of locks.

Answer. There are, in all, nine locks; one at the entrance of the canal at Love island, called the regulating lock, two at Conawingo, three at Octoraro, and three at tide water; they are all of the same dimensions, one hundred feet in length, and twelve feet clear in the width, and are all built of stone.

4th. Supply of water; whence obtained; its amount reduced to cubic feet per minute, hour, or day; its elevation above the highest point of the canal; length of feeders; situation and contents of reservoirs; what additional resources may be resorted to, if the present supply should fall short of the quantity wanted.

Answer. The supply of water is, and always will be, much greater than can be wanted in this canal. It is taken from the river Susquehannah, through the regulating lock, from the Conawingo and Octoraro creeks, both of which are large streams of water that never fail, and are crossed by the canal. The amount of cubic feet produced by these streams, respectively, it would be difficult to ascertain. They each produce a great surplus at all times. At the intersection of the canal, they are both below its level. The Conawingo is raised by a dam, constructed of logs and earth, ten feet high, to bring it on a level with the canal, and over which dam the surplus water is discharged. The Octoraro is raised in like manner twelve feet high, and the surplus water discharged in the same way. These creeks or streams, at a little distance from the canal, are elevated much above it, and take their rise in a high and broken country, at many miles from the canal, and discharge such a quantity of water at all seasons as to render any other reservoir for the use of the canal wholly unnecessary. If, however, a further supply of water should ever be wanted, it can be had, in any quantity, through the regulating lock, by extending the wing dam from the upper end of Love island into the river, and turning the water from thence into the canal.

5th. Designation of such part of the route where the natural or improved bed of rivers is used.

Answer. The bed of the river is used, and has been partially improved, from the head of the canal up to Columbia, the distance about twenty-three miles, and affords a tolerable safe passage down in the spring and fall of the year, but boats cannot return in its present state without difficulty.

6th. Depth and breadth of canal; burden of vessels; breadth of towing paths.

Answer. The water in the canal is in all places three feet deep, and thirty feet wide; vessels of two to three hundred barrels burden now pass it; and the towing path is ten feet wide.

7th. Aqueducts across valleys or rivers; tunnels through hills; bridges across the canal.

Answer. There are no aqueducts across any valley or river. The two rivulets or creeks before mentioned are crossed by raising their waters to a level with the canal; nor are there any tunnels through hills, or bridges across this canal, except a wooden bridge at the Bald Friars, where there is a road down to the river, and a ferry across it.

8th. Particular obstructions and difficulties surmounted, or to be encountered.

Answer. The Hollow Rock and Bald Friar falls, a little below the head of the canal, and Amos's falls, three miles above tide water, are the most dangerous and difficult in the river. These are surmounted by the canal for all boats, arks, and rafts of any length, but not exceeding twelve feet wide. The difficulties to be surmounted lie between the head of the canal and Columbia, and require additional improvement, so as to admit of a safe navigation for arks and rafts during the spring and fall months, and for boats of ten tons burden, drawing two feet water, to come down and return at all times when the river is not obstructed by ice.

9th. Defects in the plan or execution, and the proposed remedies.

Answer. The only defect that has been discovered by experience in the plan of the canal is in the width of the locks. When they were first erected, the largest boat navigating the river above Columbia was only eight feet beam, and eighty feet keel, carrying fifteen hundred bushels of wheat; arks were not in use. It is now found that the greatest part of the produce or plank that comes down to the tide is brought in arks and rafts, from fifteen to seventeen feet wide, and from sixty to eighty feet long, which makes it necessary to widen the locks to eighteen feet, to afford a safe passage through the canal. This alteration has been forcibly solicited by the traders down the river, on account of the number of arks and rafts lost in Bald Friar's and Amos's falls, opposite the canal, every season in the highest water; as also to save a heavy expense in pilots, and an additional number of hands, which they are obliged to engage at Columbia, on account of this dangerous part of the river, and who are not wanted to run to the head of the canal only. Besides, the water will answer to navigate three times as long in the season to the head of the canal, through which it can pass at all times, than it will over Bald Friar's and Amos's falls. By improving the river from the head of the canal to Columbia, boats can come down and return during the greatest part of the summer. At present the bed of the river is finished from the head of the canal to Peach Bottom, distance about four miles. From thence to Culley's falls is five miles, and can be completed, by contract, for $1,000. From thence to the Indian steps is six miles, not difficult, but will require improvement. The Indian Steps and Turkey Hill falls, four miles above them, will be most expensive. From Turkey Hill to Columbia is four miles, and will only require a few rocks to be removed. What the whole expense will amount to cannot be estimated with any certainty, as much depends on the judgment and economy of the persons employed to superintend the work; but, from the report of Colonel Antes, who was employed one season and part of another to improve Turkey Hill falls and a distance below, and who carefully examined the whole distance, it has been a generally received opinion that $50,000 would be fully adequate.

10th. Estimate of the tonnage of vessels; species, weight, and value of the articles annually conveyed by the canal; expense of carriage by the canal, compared with land or river carriage before the canal was made; time employed in navigating the canal.

Answer. In answering this query, it will be impossible to form any conjecture of what will be the trade through the canal when the proposed improvements are accomplished. The canal has now been finished and in operation two years, and the company have been opposed by the contending interests of the States of New York and Pennsylvania, and by the private interests and prejudices of individuals of the State of Maryland. The number of vessels which have passed the canal has been very few, partly owing to the narrowness of the locks, partly from the want of water from the lower locks into three feet water at low tide, which the company have in contemplation to remedy by extending the canal along the margin of the river about seven hundred yards, as soon as they can raise funds to accomplish it. The gross amount of the tolls have, consequently, been but trifling. The toll on each article will best appear by the table of tolls hereunto annexed.

The expense of carriage on one hundred barrels of flour from Columbia to Philadelphia by land is $125; from Columbia to Baltimore by water, through the canal, is $50; by water, down the bed of the river, when the state of the river will admit of it, is $70; and the time employed in passing through the whole of the canal is six to seven hours.

11th. Capital already expended, vested, or wanted for completing the work.

Answer. The sum already expended in the purchase of lands through which the canal passes, and in making the canal and locks, &c., is upwards of £95,000, and it will require, it is supposed, about $60,000 more to make all the proposed improvements from tide water to Columbia.

12th. Expenses per mile, and in the whole, and, as far as practicable, of sundry component parts of the work in all its details.

Answer. The whole expense of making the canal and locks, and purchasing the requisite lands, and clearing the bed of the river, amounts to £95,000, as above.

The work has been performed partly by contract, and partly by hiring laborers, which renders it impossible to be more precise in this answer.

13th. Rate and gross amount of tolls; annual expense of repairs and contingencies; annual nett income.

Answer. The gross amount of tolls from the commencement has been, for two hundred and eighty-eight boats, arks, and rafts, $957 40; the rate of each article as per list annexed. The expenses are, a manager, at $500 per annum; four laborers to attend the locks, at $160 per annum each; and other contingencies, amounting, in the whole, to about the sum of $1,200 per annum. But, when the proposed alterations and improvements are made, the whole expense will not exceed $1,000.

14th. Substance of charters and acts of Legislature on the subject.

Answer. The first law of Maryland on this subject, passed November session, 1783. It incorporates the company with a capital of £20,000; directs the canal to be thirty feet wide, and three feet deep, to be taken or cut from Love island to tide water. It gives the use of the waters of the river as well for the canal as for water works, and prohibits the cutting of any other canal within the line of Maryland. It is a perpetual charter, and directs the canal to be completed in seven years from October, 1784, &c.

A supplement to the first law passed at November session, 1784, which declares the canal, &c. to be real estate, and to be vested in the proprietors as tenants in common according to their shares, and not liable to pay any tax, imposition, or duty whatever. It regulates the tolls, which were afterwards permitted to be increased.—(See law, November session, 1803.)

An act passed at November session, 1790, extends the time for completing the canal to the 1st of October, 1798, and allows the shares to be extended to thirty of £1,000 each, and permits foreigners to become proprietors.

An additional supplement, passed at November session, 1797, increasing the capital £10,000 more, or ten shares, and extending the time for completing the canal to the 1st of December, 1805.

A further supplement, passed November session, 1799, authorizes the subscription of fifty additional shares of stock, of £1,000 each, and directs £5,000 to be expended in clearing the bed of the river within the State of Maryland, for which half-tolls are to be allowed to the company; and loans a sum of money, &c.

An act passed at November session, 1801, allows an increase of ten more shares.

An act passed at November session, 1803, allows an increase of tolls upon the canal, not exceeding quadruple the sum payable by the act of November session, 1784, and abolishes the half-tolls on the bed of the river.

100 shares, of £1,000 each, have been authorized by law, making a capital of	£100,000
75 only have been subscribed,	75,000
25 remain unsubscribed.	£25,000

The following is the rate of tolls now established upon the Susquehannah canal:

On every pipe or hogshead of wine containing more than 65 gallons,	$1 00
On every hogshead of rum or other spirits,	75
On every hogshead of tobacco,	50
Every cask between 65 and 35 gallons rates as one-half of a pipe or hogshead; barrels one-fourth part; and smaller casks or kegs in proportion, according to the quality and quantity of their contents of wine or spirits.	
For every bushel of wheat, peas, or beans,	2
For every bushel of flax seed,	3
For every bushel of Indian corn or other grain, or salt,	1½
For every barrel of pork,	25
For every barrel of beef,	20
For every barrel of flour,	10
For every ton of hemp or flax,	1 50
For every ton of pot ash, bar or unmanufactured iron,	1 00
For every ton of pig iron, stone, or stone ore,	25
For every ton of castings, and copper, lead, or other ore than iron ore,	75
For every hundred bushels of lime,	50
For every chaldron of coals,	25
For every hundred of pipe staves,	10
For every hundred of hogshead staves, or pipe or hogshead heading,	6
For every hundred barrel staves or barrel heading,	4
For every hundred cubic feet of plank or scantling,	40
For every hundred cubic feet of other timber,	20
For every gross hundred weight of all other commodities,	6
For every empty boat or vessel which has not commodities on board to yield so much, except an empty boat or vessel returning, whose load has already paid the tolls; in which case she is to repass toll free,	1 00

I take the liberty of accompanying this report with two pamphlets, which will be found to contain much correct and useful information respecting the extent of the waters of the Susquehannah, and the public good that will result from improving its navigation.

With great respect, I am, sir, your humble servant,

ROBERT GILMER, *Susquehannah Canal Comp'y.*

C. No. 6.

FALLS OF THE OHIO.

SIR: LOUISVILLE, *October* 20, 1807.

I herewith enclose a few remarks, in addition to the notes and draughts [see draught annexed] forwarded to you through the hands of Major Morrison or Mr. Cosby, which were all crowded upon a sheet of parchment for want of large paper, and to show the whole, as far as possible, at one view. I had but part of four days allowed to prepare it, otherwise I might have been somewhat more nice, and probably more explicit; but I presume the information required may be found there.

I am well aware of the danger to which this project will be exposed, when it meets the eye of an engineer or undertaker of other works, which depend on Congress for assistance. The city, I have no doubt, will abound with such men, who are under an impression that the amount and encouragement bestowed here will be so much deducted from their concerns; others will condemn it in hope of obtaining a job for themselves; and many members of Congress may be swayed by the great weight and interest in favor of Eastern canals or other public works; and there is yet a rancor in the breast of the *over the river canal party* which will show itself in some form.

Theoretical architects too often delight in unnecessary expense on all public works; and such are generally incapable of surmounting any other than imaginary obstacles of their own raising; they too often despise the assistance of nature, and substitute their own work, which renders both useless; although in that advance, more expense is incurred than would have perfected the object desired, had there been proper arrangement at the outset.

Most respectfully, sir, your most obedient,

J. BROOKS.

LOUISVILLE, *October* 28, 1807.

The queries respecting canals, forwarded by the Secretary of the Treasury, overreach most generally the simplicity of the work necessary to be done at this place in perfecting a canal, to answer the most important and desirable purposes. The shape and construction of the ground, and the action of the water, naturally co-operate so effectually to assist in perfecting the work, that nothing of consequence but simple labor is required to complete it; considering that when there is a sufficiency of water in other parts of the Ohio river for a ship of ten feet draught, there is but about six feet fall at the rapids, no difficulty can be raised on account of the construction of the locks for the passage of such ship or smaller craft; especially as we have rock to go upon, which may be shaped to the mind; and the two best and most secure harbors for large and small crafts, at all seasons, will be connected by canal. The rock affords most excellent materials for walling; and it may be excavated for less than one dollar per cubic yard, and the quantity of stone thus furnished, will be found to answer very nearly the quantity required for the

walls. The smallest measure of wall used in such cases, in proportion to the magnitude of the work, will only be required here, owing to the strength and compactness of the ground through the whole course.

Considering the price of labor and provisions, the simplicity of the work to be done, though of magnitude, the certainty of not having to encounter any thing precarious, and the perfectly appropriate quantity and fitness of materials naturally ranged in place so as to produce the most desirable advantages in the operation, it is certain that the whole expense ought not to exceed $200,000, and for that sum and the benefit of the lottery allowed properly applied, it may be completed, whatever obstacles may be labored to view by an imposing party.

The draught and notes in the hands of the honorable John Pope were taken from the lowest water, consequently differ somewhat from those formerly presented; it was at first contemplated to improve the river six or seven hundred yards below F, and enter the land at G or H, noted on a former plan, that may yet be done; but considering the action of the water at this point, through all the different stages which have since been particularly observed, it will be more proper to enter the land from the basin at F.

The expenses already incurred amount to about $2,000, and the subscriptions to $70,000.

The locality of this site, in relation to the country watered by the Ohio and its branches, may, with due attention to improvement, remedy, in a great measure, the deficiency of constant water-falls, so well known through all the valley of Ohio. It must be admitted that there is not a country in the world equally extensive and fertile, more deficient of water-falls to assist in manufactures; that the productions of this country are immense; and that it is favored with an easy navigation during the greatest part of the year to all points except passing the rapids.

The dormant wealth of this important section of the national domain can be brought into life and action only by a free and open navigation, and the assistance of water-works for the encouragement of manufactures.

This project of the contemplated canal includes the perfection of the navigation, and the supply of water for manufactures to an immense extent; and it is evident that this operation will advance the national interest in a rate of progression that must infinitely exceed the most sanguine calculation.

LAWS OF KENTUCKY.

IN GENERAL ASSEMBLY, *December* 21, 1805.

Resolved, by the Senate and House of Representatives of the State of Kentucky, in General Assembly met, That the Governor of this Commonwealth be requested immediately to transmit to the Governors of the States of Pennsylvania, Virginia, Ohio, New York, and Maryland, a copy of the act incorporating the Ohio Canal Company, the report of the managers of the said company to the present Legislature, the notes and map of Mr. Jared Brooks, and to invite the enlightened co-oporation and aid of the said States in cutting a canal around the rapids of the Ohio river, in the accomplishment of which the whole Western country is so deeply interested.

WILLIAM LOGAN,
Speaker of the House of Representatives.
THOMAS POSEY,
Secretary of the Senate.

Approved, December 26, 1805.

CHRISTOPHER GREENUP,
Governor of the Commonwealth of Kentucky.

By the Governor:

JOHN ROWAN, *Secretary.*

IN GENERAL ASSEMBLY, *December* 21, 1805.

To the Honorable the Congress of the United States: The Senate and the House of Representatives of the State of Kentucky, in General Assembly met, respectfully represent:

That they have passed a law incorporating a company for the purpose of cutting a canal to avoid the rapids of the river Ohio, in the execution of which the whole Western as well as the United States generally, are very deeply interested. Your memorialist would respectfully submit to the consideration of your honorable body, whether the accomplishment of that useful undertaking would not greatly increase the value of the national domains, and render them a much more productive source of revenue to the United States. Firmly impressed with this belief, they are emboldened to approach your honorable body, and to solicit your enlightened co-operation and aid, either by subscription, or donation in land, or otherwise, as you in your wisdom may prescribe, to be vested in the said company according to their respective interests, whenever the said canal shall be completed. Your memorialists would further represent that, from the evidence now before them, they feel no hesitation in giving it as their decided opinion, that the Kentucky side is the best for a canal, that the cost will not probably exceed $200,000, and that, when completed, it will much better answer the purposes of navigation; but as some competition has arisen on the subject of preference of the two sides of the river, and should your honorable body entertain doubts on this point, we invite the appointment of an engineer to view the two situations, in whose opinion and report implicit confidence can be reposed.

Resolved, That the Governor of this State do immediately transmit the above memorial, with a copy of the act incorporating the Ohio Canal Company, the report of the managers of said company, and Mr. Jared Brooks's notes to the Congress of the United States.

WILLIAM LOGAN,
Speaker of the House of Representatives.
THOMAS POSEY,
Secretary of the Senate.

Approved, December 26, 1805.

CHRISTOPHER GREENUP,
Governor of the Commonwealth of Kentucky.

By the Governor:

JOHN ROWAN, *Secretary.*

AN ACT to amend the act incorporating the Ohio Canal Company.

APPROVED, *December* 20, 1805.

Whereas it is represented to the present General Assembly, that the opening a canal at the falls of the river Ohio will be of great public utility, interesting to the commerce and agriculture of this State, and the Western country generally, and many persons are willing to subscribe large sums of money to effect that great national object, and it being just and proper that they, their heirs and assigns, should be empowered to receive, by way of toll, satisfaction for the money by them advanced in carrying the work into effect: And whereas, it is also represented that the law of 1804, incorporating the Ohio Canal Company, is defective in many of its important provisions, and that many persons have subscribed large sums of money in the books opened for subscriptions under the directions of the before recited act; therefore,

SEC. 1. *Be it enacted by the General Assembly*, That all persons who have heretofore subscribed, under the before recited act, shall be considered as subscribers under this act, unless within three months after its passage they shall declare personally or by letter to the president and directors, that they wish not to be so considered.

SEC. 2. *Be it further enacted*, That James Berthoud, Thomas Prather, George Wilson, Peter B. Ormsby, James Hunter, John Bradford, Alexander Parker, John Jordan, Jun., Adam Steele, Wingfield Bullock, and Worden Pope, and the present and future subscribers, their successors and assigns, be, and they are hereby, erected into a body corporate and politic, by the name of the Ohio Canal Company, and are hereby ordained, constituted and declared to be forever hereafter a body politic and coporate in fact and in name; they and their successors shall and may have continual succession, and shall be persons in law capable of suing and being sued, pleading and being impleaded, answering and being answered unto, defending and being defended, in all courts and places whatsoever, in all manner of actions, suits, complaints, matters, and causes whatsoever, and that they and their successors may have a common seal, and make and alter the same at their pleasure; and also that their successors, by the same name and style, shall be in law capable of purchasing, holding, and conveying any estate real or personal, for the use of said corporation.

SEC. 3. *And be it further enacted*, That the capital stock of said company shall consist of ten thousand shares of $50 each, and that subscriptions to the said stock may be received by such person and persons, and at such places within and without this State, and under such regulations as the said James Berthoud, Thomas Prather, George Wilson, Peter B. Ormsby, James Hunter, John Bradford, Alexander Parker, John Jordan, Jun., Adam Steele, Wingfield Bullock, and Worden Pope, directors for the time being, or a majority of them, shall prescribe and ordain; and the said directors, or a majority of them, shall meet on the first Monday in February next, at such place as they shall appoint for that purpose, and elect one of their own body to be their president.

SEC. 4. *And be it further enacted*, That the stock, property, and concerns of the said company shall, until the first Monday in April, 1807, be conducted and managed by the directors aforesaid, or a majority of them; and after that day the same shall be conducted and managed by twenty-four directors, any seven or more of whom shall constitute a board, being stockholders, who shall hold their office for one year from the said first Monday in April; and the said directors shall be elected by ballot annually, on the first Monday in April, at such hour of the day, and at such place in the town of Louisville, or Shippingport, as the said president and directors, or a majority of them for the time being, shall appoint; and public notice shall be given by the said directors, not less than thirty days previous to the time and place of holding said election, by an advertisement to be inserted in the newspapers of the public printer, and in some one or more newspapers printed in the State of Kentucky; and the said election shall be made by such of the stockholders as shall attend for that purpose, or by proxy, each shareholder having one vote for every share as far as ten shares, and one vote for every five shares above ten; and the directors so to be chosen shall, at their first meeting, elect, by ballot, one of their number to be their president; and that the said president and directors, and the president and directors hereafter to be chosen, a majority of whom being assembled, shall constitute a Board, and shall have power to appoint the time and place of all meetings for the despatch of business, and to appoint such superintendents, engineers, treasurer, clerks, and other officers, agents, and servants, and exact from them such security for their performance of the duties assigned them, as the said directors, or a majority of them, shall judge requisite, proper, and necessary, for carrying into effect the purpose of this act, and to agree for and settle their respective wages and allowances; and to pass and sign their accounts, and also to make and establish rules of proceedings, and to make such by-laws, rules, and regulations, not inconsistent with the constitution and laws of the United States, or of this State, as may appear to them most conducive to the ends proposed by this act, and to conduct all other business and concerns of the said company: *Provided, however*, That the said company shall not be permitted to issue bills of credit payable to any person or bearer, nor shall they be permitted to exercise the privilege of banking in any respect whatever.

SEC. 5. *And be it further enacted*, That in case of the death, resignation, or refusal to act, of any director or directors, chosen as aforesaid, it shall and may be lawful for the remaining directors, upon public notice being given in any gazette published in Louisville, or the newspaper of the public printer, at least twenty days for that purpose, to proceed to elect a director or directors, to fill such vacancy or vacancies.

SEC. 6. *And be it further enacted*, That in case of the death, resignation, or refusal to act, of the president, it shall and may be lawful for the directors to choose a president *pro tempore*, and for the meeting only for which he shall be chosen, and may, at any of their general meetings, remove their president or any of their directors, and appoint others for and during the remainder of the term, for which such person or persons were at first to have acted.

SEC. 7. *And be it further enacted*, That every president, director, and treasurer, before he acts as such, shall take an oath or affirmation for the due execution of his office.

SEC. 8. *And be it further enacted*, That the subscription for the shares in said company shall be made personally, or by power of attorney, and shall be paid in current money of the United States, and, whenever the whole amount of the capital aforesaid is subscribed for, the president and directors, or a majority of them, shall return a just and true list of the subscribers, of the sums subscribed by each, under their hands and seals, to the clerk of the county court of Jefferson county, to be there recorded.

SEC. 9. *And be it further enacted*, That, after the said first meeting of the subscribers at Louisville, or Shippingport, as aforesaid, the attendance of proprietors in person, or by proxy, having two thousand shares at least, shall be necessary to constitute a meeting of the proprietors, on the first Monday in April, 1807, and on the same day in every year thereafter, at such convenient place as shall be, from time to time, appointed for the said general meeting; but if a sufficient number should not attend on that day, the proprietors who do attend, may adjourn the meeting from day to day, till a general meeting of the proprietors shall be had, which may be continued, from day to day, till the business of the company is finished; to which meeting the president and directors shall make reports, and render distinct and just accounts of all proceedings, and, on finding them justly and fairly stated, the proprietors then present, or a majority of them, shall give a certificate thereof, a duplicate of which shall be entered in the

company's books. And, at such yearly meetings, after leaving in the hands of the treasurer such sums as the proprietors, or a majority of them, may judge necessary for repairs and contingent charges, an equal dividend of all the net proceeds arising from the tolls herein granted, shall be ordered and made to and among all the proprietors of the said company, in proportion to their several shares; and, upon any emergency in the interval between the said yearly meetings, the said president, or a majority of the said directors, may appoint a general meeting of the proprietors of the said company, at any convenient place, giving at least one month's notice in the newspaper of the public printer; which meeting may be adjourned and continued as aforesaid.

Sec. 10. *Be it further enacted*, That the Governor of this Commonwealth be, and he is hereby, authorized and requested to subscribe for 1,000 shares in said company; and the Auditor of Public Accounts is hereby directed, on the application of the president and directors, or their order, to issue his warrant on the treasurer for the proportion of said shares, which the said president and directors may require, as by this act before directed: *Provided, however*, That the amount payable by the State for the said shares, shall not exceed $10,000 per year, payable on the 20th day of December, annually, unless by the assent of the General Assembly; and the treasurer shall pay the said sums out of any money in the treasury.

Sec. 11. *And be it further enacted*, That 1000 other shares in the said company shall be reserved for the future disposition of the General Assembly of Kentucky. And the said governor, for the time being, shall have a right to vote according to such shares, in person, or by proxy, duly authorized by commission, and under his hand and seal, who shall receive the proportion of the tolls and other profits aforesaid, which shall, from time to time, become due to this State for the shares aforesaid.

Sec. 12. *And be it further enacted*, That the tolls or other profits which may, from time to time, be received on the shares subscribed for on the part of this State, shall be paid annually or half-yearly, as the same may be received, or within one month thereafter, into the public treasury: *Provided, however*, That until 3,000 shares shall be subscribed, either by some State, the United States, or individuals, no money shall be drawn from the treasury of this State, on account of the sum which the Governor is authorized to subscribe on the part of this Commonwealth.

Sec. 13. *And be it further enacted*, That it shall be lawful for the said company hereby incorporated, and for all and every person or persons employed by or under them, for the purposes contemplated by this act, from time to time, to enter upon any lands contiguous or near to the said canal and other water works, or the places which may be selected for or intended to be used or employed for the same, with carts, wagons, and other carriages, and beasts of draught and burden, and all necessary tools and implements, both for executing and making, and for altering and repairing the said works, or any of them; and to take and carry away any stone; clay, gravel, sand, or earth, from the same, for the making, altering, or repairing of the said works, or any of them; subject always to the making of compensation for all damages thereby occasioned, either by agreement of the parties, or in the mode herein directed in relation to the condemnation of land.

Sec. 14. *And be it further enacted*, That whenever the said canal shall cross any public or private laid out road or highway, or shall divide the grounds of any person or persons, into several parts, so as to require a bridge across the same, the said president and directors shall cause a bridge fit for the passage of wagons and carts, to be built, and forever thereafter maintain, and keep in repair at all and every place and places so divided, at the proper cost and charges of the said company. But nothing herein contained shall prevent any person from erecting and keeping in repair any foot or other bridge across the said canal, at his or her own expense, when the same shall pass through his or her ground. *Provided*, That the same shall be of such height above the water as shall be usual in the bridges erected by the company: *And provided also*, That such foot or other bridges to be erected by the owner or owners of such ground, shall not interfere with any of the locks, buildings, passage of vessels, boats, rafts, or other works of the company.

Sec. 15. *And be it further enacted*, That the said president and directors so elected, and their successors, or a majority of them assembled, shall have full power and authority to agree with any person or persons on behalf of said company, to cut such canal on the Kentucky side of the said river, and erect such locks, and to perform such works as they shall judge necessary for opening, improving, and extending the navigation of the said river, and for other purposes authorized by this law; and if the said president and directors shall deem it proper and expedient to carry on the same from place to place and from time to time, and upon such terms, and in such manner as they shall think fit, and out of the money arising from the subscriptions and tolls and other aids hereinafter given, to pay for the same: *Provided always*, That the treasurer shall give bond in such penalty, and with such security as said president and directors, or a majority of them, shall direct, for the true and faithful discharge of the trust reposed in him, and that no officer in the said company shall have any vote in the settlement or passing of his accounts.

Sec. 16. *And be it further enacted*, That it shall be lawful for the said company to receive from the United States, or from any State, or from any body corporate or politic, donations of lands, money or other chattels, for the use of the said company, and to receive for the same use and purpose, voluntary subscriptions and donations from any individual or individuals, who may be disposed to encourage and promote the objects of this act. And it shall and may be lawful for the said company, in case of refusal or neglect of payment, in the name of the said company, to sue for and recover of all such subscribers, their heirs, executors or administrators, the sums by them respectively subscribed, by action of debt, or upon the case in any court of record, having competent jurisdiction.

Sec. 17. *And be it further enacted*, That it shall be lawful for the United States to subscribe for any number of shares in said company not exceeding $60,000, and that it shall be lawful for the State of Pennsylvania to subscribe for any number of shares not exceeding $30,000; Virginia, not exceeding $30,000; Maryland, not exceeding $20,000; New York, not exceeding $20,000; Ohio, not exceeding $20,000.

Sec. 18. *And be it further enacted*, That the said president and directors, and their successors, or a majority of them, shall have full power and authority in their discretion from time to time, as money shall be wanted, to make and sign orders for that purpose, and direct at what time, in what manner, and in what proportion the proprietor shall advance and pay off the sums subscribed, which orders shall be advertised at least two months in the paper of the public printer, and they are hereby authorized and empowered to demand and receive of the several proprietors from time to time, the sums of money so ordered to be advanced, for carrying on and executing, repairing and keeping in order the said works, until the sums subscribed shall be fully paid, and to order the said sums to be deposited in the hands of the treasurer, to be by him disbursed and paid out, as the said president and directors, or a majority of them, shall order and direct; and if any of the said subscribers shall refuse or neglect to pay their said proportions within one month after the same so ordered and advertised aforesaid, the said president and directors or a majority of them, may have sold at auction, and transfer to the purchaser, the share or shares of such subscriber, so refusing or neglecting payment, giving at least two months' notice of the time and place of sale, in the paper of the public printer, and after retaining the sum due, and charges of the sale out of the money produced thereby, they shall refund and pay the overplus, if any, to the former owner upon demand; and if such sales shall not produce the full sum ordered and directed to be advanced as aforesaid, with the incidental charges, the said president and

directors, or a majority of them, may, in the name of the company, sue for and recover the balance by action of debt or on the case, in any court of record having competent jurisdiction, and the said purchaser or purchasers shall be subject to the same rules and regulations as if the same sale and transfer had been made by the original proprietor.

Sec. 19. *And be it further enacted*, That, in consideration of the expenses, the said proprietors shall be at in opening the said canal, and improving and extending the navigation of the said river, and in keeping the said canal and works in repair, the said works and canal shall be and the same are hereby vested in the said proprietors, their heirs and assigns forever, in proportion to their respective shares, and the same shall be real estate, and be forever exempt from the payment of any tax, imposition or assessment whatever; and it shall and may be lawful for the said president and directors at all times forever hereafter to demand and receive at such place or places on the said canal, as they shall hereafter judge and determine to be most convenient for all vessels, boats, merchandise and commodities conveyed through the whole extent of the said canal, according to the following tables and rates, to wit:

For each ship or other sea vessel above one hundred and not exceeding four hundred tons burden, twelve cents per ton.	
Ditto above ninety and not exceeding one hundred tons each,	$11 75
Ditto above eighty and not exceeding ninety tons each,	11 25
Ditto above seventy and not exceeding eighty tons each,	10 50
Ditto above sixty and not exceeding seventy tons each,	9 75
Ditto above fifty and not exceeding sixty tons each,	9 00
Ditto above forty and not exceeding fifty tons each,	8 00
Ditto above thirty and not exceeding forty tons each,	7 50
Ditto above twenty and not exceeding thirty tons each,	7 00
Ditto all not exceeding twenty tons	6 00
For each boat, except ferry boats, not more than fourteen feet wide and thirty feet long,	3 00
For each boat not more than fourteen feet wide and forty-five feet long,	4 00
For each boat not more than fourteen feet wide and sixty feet long,	5 00
And for every foot over and above fourteen feet wide and sixty feet long,	09
For each barge, batteau, perogue or canoe, not more than thirty-five feet long,	2 00
For each barge, batteau, perogue or canoe, not more than forty-five feet long,	3 00
For each barge, batteau, perogue or canoe, not more than sixty feet long,	4 00
And for every foot over and above sixty feet long,	09
For each hundred of pipe or hogshead stave, or pipe or hogshead, if floated on a raft,	04
For each hundred feet of plank or scantling, if floated on a raft,	04
For each hundred cubic feet of other timber, if floated on a raft,	09

And that the said rates under the limitation aforesaid, shall be collected at such places as the president and directors of the said company or a majority of them, may, from time, to time determine, and that the said tolls be rated and paid in current money of the United States.

Sec. 20. *And be it further enacted*, That the collector of tolls, duly authorized and appointed by the president and directors of the said corporation, may stop and detain all vessels, boats and rafts, using the canal, until the owner or commander or supercargo of the same shall pay the toll, so as aforesaid fixed, or may distrain the said vessel, boats or rafts, or part of the cargo therein contained, sufficient, by the appraisement of two disinterested persons, to satisfy the same, which distress shall be kept by the collector of the tolls, taking the same for the space of eight days, and not being redeemed, shall afterwards be sold at public vendue in the town of Louisville or Shippingport, to the highest bidder, in the same manner and form as goods distrained for rent are by law sold, rendering the surplus on demand, if any there be, after the payment of the said toll and costs of distress and sale, to the owner or owners thereof.

And whereas it is necessary for making the said canal, locks and other works, that provision should be made for condemning a quantity of land for that purpose—

Sec. 21. *Be it therefore enacted*, That it shall and may be lawful for the president and directors, or a majority of them, to agree with the owner or owners of any land through which the canal is intended to pass, for the purchase thereof, and in case of disagreement, or in case the owner or owners thereof shall be *feme coverte*, under age, *non compos*, or out of the State, on application to any two justices of the peace of the county in which lands shall lie, the said justices shall issue their warrant under their hands and seals, to the sheriff of their county, directing him to summon a jury of twenty-four inhabitants of his county, of property and reputation, not related to the parties, nor in any manner interested, to meet on the land to be valued on a day to be expressed in the warrant, not less than ten, nor more than twenty days thereafter; and the sheriff, upon receiving the said warrant, shall forthwith summon said jury, and when met, shall administer an oath or affirmation to every juryman that shall appear, that he will faithfully, justly, and impartially value the said land, not exceeding one hundred acres, and all damages the owner thereof shall sustain by cutting through such land, according to the best of his skill and judgment, and that in such valuation he will not spare any person for favor or affection, or any person grieved for hatred, malice, or ill-will, and the inquisition thereupon taken shall be signed by the sheriff and some twelve or more of the jury, and returned by the sheriff to the clerk of his county, to be by him recorded, and upon every such valuation the jury is hereby directed to describe and ascertain the metes and bounds of the lands by them valued, and their valuation shall be conclusive on all persons, and shall be paid by such president and directors to the owner or owners of the land, or his or their legal representatives, and on payment or tender thereof the said company shall be seized in fee of such land as is conveyed by the owner to them and their successors by legal conveyance.

And whereas some of the places through which it may be necessary to conduct the said canal may be convenient for erecting mills, forges, or other water works, and the person or persons possessed of such situations may design to improve the same, and as it is the intention of this act not to interfere improperly with private property, but for the purposes of improving and perfecting the said navigation—

Sec. 22. *Be it therefore enacted*, That the water, or any part thereof conveyed through any canal, or cut made by the said company, shall not be used for any other purpose but navigation, unless the consent of the proprietor or proprietors of the land through which the same shall be led, be first had, except the company shall be at liberty to erect water works on that part of the ground lying on each side of the foot of the canal on the bank of the river, and which it will be necessary to condemn for the purposes of securing and guarding the said canal, which condemnation shall not exceed the distance of forty poles on the said river, and shall not extend further on each side of the canal up the same than will be sufficient for cuts and aqueducts to convey the water from the upper lock to the bank of the said river; and it shall be lawful for the president and directors, or a majority of them, to purchase of the proprietor or proprietors of the lands adjoining the said canal, so much land as the said company judge necessary

to erect mills, forges, or other water works thereon, or to sell or lease to the said proprietor or proprietors, such portions of the water as the said president and directors may think proper for the erection of water works; and the said president and directors, or a majority of them, are hereby empowered and directed, if it can be conveniently done to answer both the purposes of navigation and water works aforesaid, to enter into reasonable agreements with the proprietor or proprietors of such situation concerning the just proportion of expenses of making large canals, or cuts capable of carrying such quantities of water as may be sufficient for the purposes of navigation, and also for any such water works as aforesaid.

Sec. 23. *And be it further enacted*, That the said president and directors, or a majority, are hereby authorized to agree with the proprietor or proprietors for the purchase of a quantity of land not exceeding one acre, at or near the place of receipt of tolls aforesaid, for the purpose of erecting necessary buildings; and, in case of disagreement or of any of the disabilities aforesaid, or of the proprietor or proprietors being out of the State, then such lands may be valued, condemned, and paid for as aforesaid, for the purpose aforesaid, and the said company shall, upon payment of the valuation of the said land, be seized thereof in fee simple as aforesaid.

And whereas sound policy requires that the laudable designs of those who may become adventurers in the aforesaid company, should be patronised by legislative sanction.

Sec. 24. *And be it therefore enacted*, That it shall and may be lawful for the said president and directors of the Ohio Canal Company, or a majority of them, to propose any scheme or schemes of a lottery, for raising of a sum of money not exceeding the sum of $30,000, and to sell and dispose of the tickets therein: *Provided*, That the said directors, or a majority of them, shall, before the sale or disposal of any ticket or tickets in such lottery, give bond to the State of Kentucky in the penalty of $60,000, conditioned that they will well and truly apply the moneys arising therefrom, according to the proposed schemes, within six months after the drawing thereof, to the payment of the prizes drawn by the fortunate adventurers in said lottery, upon application being made by him, her, or them for the same, and the necessary expenses incurred in the management thereof, and the residue to the use of the company in such manner and to such purposes as the said company may order and direct, in order to carry into effect the provisions of this act.

Sec. 25. *And be it further enacted*, That the said bond shall be lodged in the clerk's office of the county court of Jefferson, to be by him recorded; a copy of such bond, under the hand of said clerk, shall be good evidence in an action of debt against the said obligors or any of them, their or either of their heirs, executors, or administrators, brought in the name of the State, for the use of any person concerned, for any breach or non-compliance with the condition of the same: *Provided, nevertheless, and it is hereby enacted*, That nothing in this act contained shall authorize the said president and directors to hold such lottery, or sell or dispose of any ticket or tickets for the same, unless the directors, or a majority of them, shall first take an oath or affirmation before some justice of the peace of the county, that they will honestly demean themselves as managers and judges of the said lottery; and that they will faithfully render unto the fortunate adventurers their respective prizes; and that the certificate of such oath shall be returned with the bond aforesaid, to the county court clerk's office of Jefferson, under the seal of the justice who shall have administered the same.

Sec. 26. *And be it further enacted*, That the tolls herein before allowed to be demanded and received are granted, and shall be payable on condition only that the said Ohio Canal Company shall make the said canal sufficient for the navigation of boats drawing not more than three feet in time of low water, and which shall be at least twenty-four feet wide at the bottom.

Sec. 27. *And be it further enacted*, That in case the said company shall not begin the said canal within three years after the passage of this act, and shall not complete the same on or before the first day of January, 1815, then the said company shall not be entitled to any benefit, privilege, or advantage, and then shall all interest of the said company, and all preference in their favor as to the navigation and tolls, at, to, or through any other part of the said canal, be forfeited and cease.

Sec. 28. *And be it further enacted*, That the books of the said company shall always be open for the inspection of the General Assembly of Kentucky, or any person or persons to be appointed by them for that purpose.

Sec. 29. *And be it further enacted*, That the said canal, and the works erected thereon, in virtue of this act when completed, shall forever thereafter be esteemed and taken to be navigable as a public highway, free for the transportation of all vessels and boats, and of all goods, commodities, or produce whatever, upon payment of the tolls imposed by this act, and no other toll or tax whatever for the use of the water of the said river, and the works thereon erected, shall, at any time hereafter, be imposed by the said company, president, and directors, unless with the consent of the Legislature of this State: *And provided always*, That the same shall be subject to such further regulations by the Legislature as they shall deem expedient in order to prevent imposition by the said president and directors, or prevent fraud in evading the payment of tolls imposed on all articles or commodities carried up or down any part of the said canal.

This act shall commence and be in force from and after its passage.

WILLIAM LOGAN,
Speaker of the House of Representatives.
THOMAS POSEY,
Secretary of the Senate.

Approved, December 26, 1805.

CHRISTOPHER GREENUP,
Governor of the Commonwealth of Kentucky.

By the Governor:

JOHN ROWAN, *Secretary.*

PROVIDENCE AND CHARLES RIVER ABOVE TIDE WATER.

C.' c. No. 1.

Esteemed Friend: Providence, 4th of 9th month, 1807.

In answer to thy letter of the 1st instant, I may observe that the latitude of the main body of Charles river, at Partridge's bridge, in Franklin, according to the observation and measurement made by Joseph Harrison and others, commissioners of this State, in 1750, is 42° 10′; and the latitude of Pawtucket bridge, according to our observation of the latitude of Providence, and adding the distance hence there, is 41° 55′, which leaves the distance between Pawtucket bridge and Charles river, at the place mentioned, 15 miles; the direct line between these two points is about north and south, which passes nearly on the line between North Providence and Rehoboth, Cumberland and Attleborough, and Wrentham, and so into Franklin; the height of land between those two points, lays about nine miles from Charles river, and in the towns of Wrentham and Billingham. Springs and brooks from the north side of the elevated lands, runs into a large pond, called Whiting's, which empties into Charles

river; and from the south side, through Cumberland, springs, brooks, and the river called Abbot's run, empty into Pawtucket river, about a mile above the bridge; on both which waters, between the two great rivers, there are grist and saw mills, and blacksmiths' works; and, on Abbot's run, a small cotton mill, all which falls are easily passed by locks, the falls being small. The height of land between appears eligible to connect the waters around the separating partition; they lay but a short distance apart. Having been from one water to the other with other commissioners of this Government, on the north line, in 1791, it appears to me there can be no doubt of the *practicability of uniting the waters of the State of Rhode Island with those of Massachusetts*, in this route: but as the Secretary mentions *any other route*, I may take the liberty to mention some further facts and observations relative thereto. About 15 years ago, a canal from Providence to Worcester, in the State of Massachusetts, was projected, either through the Moshossick at the north end of this town, into Pawtucket river, a little west of Cumberland bridge, through, or by the two ponds, and so up to Worcester, through which town a branch of Pawtucket river runs, or to commence at Pawtucket, and so up the river from thence. In this project, the now Deputy Governor Lincoln, was engaged, and was chosen representative in Worcester, to their general court, with a view to obtain a charter from that State; but, finding the town of Boston so warmly opposed to the measure, and commanding such an influence, it was given up. As more than half the distance is in that State, ours could not grant a charter to answer the important object. Since that time the people of Boston projected a canal from northwest, near Connecticut river, down the Pawtucket and Charles rivers to Boston, and proceeded to take the levels, elevations, and other surveys of the land and waters, and found the route very eligible; but when they found and considered it would bring the canal near to our State, of which, and Providence in particular, the present Governor Sullivan informed me they were so jealous, that they turned their attention from the waters of Pawtucket and Charles river, to the Merrimack, where they have made the canal. These facts are mentioned to show the practicability of uniting the waters of the main bodies of Pawtucket and Charles rivers, a little further westward than a direct line from Pawtucket bridge; the junction, in that case, would be about 13 miles north-northwest of Pawtucket bridge, where the two rivers come within about 5 miles of each other, and by brooks through Cumberland and Billingham much higher; and, although this route from Providence or Pawtucket would require a little longer canal than the one mentioned as the most direct, it having the most water, may, eventually, prove the most eligible. The facts mentioned, also show that jurisdictional obstructions to public improvements of our country, by canals and turnpikes, which such local interests and prejudices occasion, should, in time, find a remedy; and would not such improving authority be proper to be vested in the General Government? In regard to the communication by Taunton river, which the Secretary's letter also mentions, I am not so well acquainted as with the more westerly route; but supposing it to be practicable, would it not be more exposed, and less secure from foreigners, being near the sea, and the entrance below Boston?

I am, respectfully, thy friend,

MOSES BROWN.

JEREMIAH OLNEY, Esq., *Collector, Providence.*

BLODGET, ESSEX, AND MIDDLESEX CANALS.

BOSTON, *December* 30, 1807.

The river Merrimack issues from a lake in New Hampshire called Winnipiseogee ponds, forty miles long; average, twenty-four wide. Another branch, Pemigewasset, issues from mountains near the Connecticut, and unites with the Winnipiseogee, thence, one hundred miles from the sea. The general course of the river is south until it comes within thirty miles of Boston; this is, until within thirty-six miles of that town, through New Hampshire, which is not within what is here expected in description; but there are Amoskeag falls, where Blodget's canal is, sixty miles from Boston, and other falls; at thirty-six miles from Boston, not on the river's course, but on a straight line, there are some small falls of water over which boats and rafts pass.

This river, when it reaches within thirty miles of Boston, changes its course to the northeast for several miles, and turns and runs easterly, and finds the sea six miles southeasterly of Newburyport, and forty miles from Boston; goes into the great receptacle over a bar that admits vessels calling for twelve feet of water; immediately where this bend to the northeast is formed, there is a fall called Pawtucket fall; this fall reaches one mile and three quarters, and the perpendicular fall in the whole is thirty-two feet. The water in the river, above that fall, is seventy-nine feet and eight inches above the sea; to that there is a fall from the lower end of the Pawtucket fall to the sea, of fifty-seven feet eight inches; but this is what, in the New England mode of expression, is called *riplings;* such shoals in the river that boats and rafts pass without difficulty.

The Essex canal is to transport boats and rafts round the Pawtucket falls; there is an elbow in the river, and the canal is cut on that. There are three locks in it, which divide a fall of about thirty-four feet, and convey boats that do not require more than three feet and a half of water. When they have passed on this canal, which is four miles long, they gain the river again, and go down to Newburyport by Haverhill; at which town they meet the tide from the sea. The expense of that canal was $———, and now bids fair to become good property.

The Middlesex canal.—This canal receives its waters as a reservoir from Sudbury on Concord river; that river issues from a pond in Framingham, and runs northeasterly through Billerica, Concord, &c., to the Merrimack, and empties itself into that river four miles below Pawtucket falls. The canal receives its supply from that river in the Chelmsford, six miles on a straight line from the Merrimack, at the head and near the Pawtucket falls; near the union of the canal with Sudbury on Concord river is a fall, where the proprietors of the canal have mills. The water of the river, above the falls, is one hundred and seven feet eight inches perpendicularly higher than the sea at Boston, and falls about fifty feet to find the Merrimack in the course of six miles.

The canal is cut on a straight line from this place to the Merrimack above Pawtucket falls; receives its waters from Sudbury river, and empties them into Merrimack twenty-eight feet over three locks, which divide that fall; they are twelve feet wide and ninety long, formed of hewn stone, laid in tarras mortar.

The Middlesex canal has to fall one hundred and seven feet from Concord river to the sea in Boston; this it does by nineteen locks in the space of twenty-two miles; the ground admitted the canal to be less crooked than the country roads commonly are.

The canal is twelve feet wide; the water necessary is three and a half feet, which is well supplied by the river. There was no place where ground was opened more than twenty feet deep, and but four or five where it was opened more than twelve; there is no place where banks are raised fifteen feet, and but a few where they are raised as much as ten. There were morasses where banks were raised, which sunk under the weight of the earth at one place forty feet, less at others; this was very expensive; some ledges cut through, which cost much money. There

are a number of aqueducts supported over rivers and brooks; one over Shawshire, two hundred and eighty feet long, twelve feet wide, twenty-two feet above the surface of the river; there is no one else as high or as long as that.

It has been an object in the forming that canal, to shun rivers and navigable waters; the canal is altogether an artificial navigation. It is cut by the side, and on the banks of rivers, without having any communication with their waters; it crosses them on aqueduct bridges without any communication with them.

The locks are seventy-five feet long, and at various distances from each other, excepting that near the middle distance between Concord river and Boston, there is fifty-seven feet fall in half a mile's distance, divided between six locks.

The boats employed on the canal are from forty to seventy-five feet long, eleven feet wide; the largest carry twenty-four; the least ten tons. The lesser boats are packets, and traverse the canal from end to end every day; the others pass as occasion requires.

A raft of a mile long, drawn by two oxen, including eight hundred tons, has been drawn on the canal at the rate of more than one mile an hour. The boats are drawn by two horses on a towing-path three miles an hour. The toll received has increased yearly the same every year, at six cents a ton, besides the hire of boats and horses; 1802, $2,000; 1806, $16,800; the accounts for 1807 are not made up.

The land purchased for the canal cost $58,000, including divers mill privileges, building lots, and farms; the cutting and forming the canal is not less than $478,000. To make the proprietors whole, and defray the expenses, the annual reception ought to be $36,000; the banks grow solid and hard, and the repairs will never be great. The proprietors were incorporated in 1793, and their powers, as a corporation, and their estate in the canal are perpetual.

Great advantages will result from clearing the Merrimack, and there are several corporations formed in New Hampshire for that purpose.

C. No. 3.

SUSQUEHANNAH AND SCHUYLKILL CANAL.

Answers to the queries respecting the Schuylkill and Susquehannah navigation.

1. The points united by the canal, are Reading on the Schuylkill, below Tulpehocken, and Middleton on Susquehannah, a distance of seventy miles.

2. The elevation of the highest ground or summit level, is ascertained to be above three hundred and ten feet above the water of the Schuylkill; and calculated to be about three hundred and eight feet above those of the Susquehannah.

3. The whole distance would require ninety locks, from six to eight feet lift each, according to the ground, and situated at different distances; must be built of hewn stone, as brick will not stand the sudden and severe changes of climate. The five locks now constructed are sixty-six feet long by nine feet six inches wide, to admit boats of sixty feet long and nine feet wide, carrying thirty tons.

4. The supply of water at the summit level is from a number of springs in the adjoining ground, which have been accurately measured, to admit seventy-five boats of seven to ten tons to ascend and descend. They are all at hand, and, without the expense of a feeder, run into the summit level as a reservoir. Further east and west along the rivers, the supply is abundant, and far exceeding any wants. If, hereafter, the trade should require additional supply of water on the summit level, either a small steam engine, or an Archimedes screw-auger might be fixed at each end thereof, at a small expense, to pump up the deficiency.

5. In the beginning it was calculated only to dig through the summit level, and a little way down each stream to a sufficient strength of water; to use the natural channels by means of dams and locks. It is now found necessary to make a canal the whole distance of seventy miles.

6. It has been determined, that the width of the bottom be twenty feet; that the depth of water be three feet and a half; that the width of the canal be thirty feet and a half; that the width of the towing path be ten feet; that the towing-path be not less than one foot above the surface of the water at any place; that the descent of the canal be at the rate of two inches per mile.

7. Some aqueducts across small creeks would be necessary; also some bridges for main roads; but solid fords will, in general, be substituted in lieu of bridges.

8. The only obstruction and difficulty is the great amount which this grand communication would naturally cost.

9. The defects in the original plan were, that this national benefit was, for want of knowledge, begun on too contracted a scale, and with inadequate funds.

10. It is estimated that many thousand boats of thirty tons will be constantly employed to convey the masts, ship timber, iron ore, coal, grain, and other produce. And it is calculated that though the expense of carriage by canal will not exceed one-third the expense by land, the quantity of produce, timber, and minerals conveyed through this canal, when finished, will give a dividend of six per cent. on a capital of one and a half million, since it would bring forth many bulky articles, and to a ready market, which the expensive land carriage, and the badness of the roads, now prevent.

11. The capital already expended is two hundred and fifty thousand dollars. A million of dollars will be amply sufficient to finish it in a masterly style, if economy is used, and good management takes place.

12. The expense per mile has been found not to exceed seventeen thousand dollars for digging, and, including the locks, each calculated to cost nine thousand dollars.

13. The rate of tolls will vary according to the bulk and value of each article. The annual repairs of canals is trifling if originally substantially finished.

14. The enclosed pamphlet, printed in 1795, recites the charter and acts of the Legislature, except that passed on 1st March, 1806, and the 1st March, 1807.

SIR: PHILADELPHIA, *December* 21, 1807.

In answer to your communication of the 7th August last, to the president and managers of the Schuylkill and Susquehannah Navigation, enclosing the queries of the Secretary of the Treasury respecting canals and artificial roads, I have the honor, on behalf of the company, to make the following reply:

The Schuylkill and Susquehannah Company was incorporated by the Governor of Pennsylvania, in pursuance of an act of the Legislature of 29th September, 1791, by the name of "the President, Managers, and Company of the Schuylkill and Susquehannah Navigation." The capital stock of the company was to consist of one thousand shares, at four hundred dollars each, amounting to four hundred thousand dollars; and the dividends were not to exceed twenty-five per cent. on the cost. The privileges and franchises of the corporation were deemed liberal

and extensive, although they were afterwards found to be deficient. The immediate object of the law was to unite the Susquehannah and Schuylkill, between Middleton and Reading, in the counties of Berks and Dauphin, by the waters of the Tulpehocken on the east, and of the Quittapahilla and Swatara to the west. This, however, was but a part of what the Legislature had in view. It was easy to foresee, in the improving state of the country, the advantages of a water communication between the lakes and great waters to the westward of the mountains, and the tide waters to the east. The most ready means of accomplishing so desirable an end were afforded by the head waters of the Allegany, of the western branch of the Susquehannah, and of the Schuylkill.

These waters, with the different portages, were surveyed and examined by the late David Rittenhouse and others, and estimates of the expense of opening a communication were laid before the Legislature.

Upon this, the above-recited law was enacted, as also another, to open the communication between Morristown and the Delaware, by Philadelphia. These were to complete the first links of the great chain of western inland navigation, between the Delaware, the Ohio, and Lake Erie. It was then contemplated only to cut and complete a still-water navigation between the Tulpehocken and Quittapahilla, a distance of between four and five miles, to navigate the natural channels of these rivers, and of the Swatara, by clearing out their beds, and by dams and temporary locks.

The works were accordingly commenced in the latter end of 1792, under the superintendence of persons appointed by the board, and were afterwards conducted under the direction of William Weston, Esq., an able engineer from England, who arrived in the year 1793. From his report to the company, in January, 1794, it appeared desirable, for the reasons urged by him, to make at once a great still-water navigation from the Schuylkill to the Susquehannah, a distance of seventy miles, and that, too, in the most complete and permanent manner. Of the expense, a particular and detailed estimate was made and laid before the board, amounting to about seventeen thousand dollars per mile, or twelve hundred thousand for the whole. By the month of December following, the summit level, and five succeeding locks, of bricks, coped with stone, each of six feet lift, and which are now but little injured, were completed; and bricks, &c. were conveyed in boats on the said summit level of the canal. This was by far the most difficult and expensive part of the work. The cost proved the estimate to be large, as the expenditure fell eight thousand dollars short of the engineer's calculation. In the mean time, application was made to the Legislature for assistance; and a law was passed, authorizing the company to raise, by way of lottery, two-thirds of four hundred thousand dollars. Under this law about forty thousand dollars were raised. The moneys paid by the subscribers amounted to near two hundred thousand dollars. Owing to the high price of labor at this time, the enormous sums paid for land and water rights, the want of judgment and experience at the commencement of a work so large and novel, and from the inadequate sums proposed to be raised by way of lottery, which was also slow in its operation, it appeared evident that the work could not be completed; and, accordingly, at the end of 1794 or beginning of 1795, its progress was arrested, leaving debts unpaid to the amount of several thousand dollars.

The charter, too, did not sufficiently protect the company from imposition in the valuation of land and water rights necessary to the works; it defined with too much precision the rate of tolls, and required bridges over the canal that would have cost enormous sums, and are now found unnecessary and even nugatory.

In this state things have remained until the last year or two, during which measures have been taken to prepare for the accomplishment of this great work. Some of the debts due to this company have been collected, and others are put into train to be collected gradually, and may ultimately prove nearly sufficient to discharge the debts owing. The Legislature have amended the charter in many material points: they have dispensed with the building of bridges; they have left the company to impose and collect their tolls in their own way, with no other restriction than not to exceed twenty-five per cent. per annum; they have guarded against imposition in the valuation of land and water; they have extended the time for completing the work; and have agreed to interest the State, on certain terms, to the amount of three hundred thousand dollars. Measures are also taken to raise, by way of lottery, the authorized sum; and the shares not paid up have been forfeited, according to law.

When it is considered that the price of labor is reduced; that the alterations in the charter will make great savings, and are otherwise encouraging; that the land for the track of the canal may now be had for a more reasonable compensatiou, and in some instances, it is expected, without any; that the sum to be derived from the lottery law may, if successful, be considerable; and that the products of the country on the waters of the Susquehannah, during the last fifteen years, have increased to an immense extent, it is conceived that the undertaking may hereafter proceed to advantage to those interested, as well as to great and permanent utility to the State and the United States, by facilitating the intercourse between the great eastern and western waters.

But the main-spring is wanting: the large capital that it is now ascertained to be necessary to finish this grand national undertaking, is beyond the means of the moneyed interest of this city, which, with more advantage and immediate benefit, is absorbed already. Though the late Legislatures of this State, equally convinced with their predecessors for more than thirty years past, of the great benefit resulting to a very great proportion, if not the whole, of this State, and the public at large, have been very liberal, nay, generous, in giving every encouragement which they could give to this undertaking, so novel and incredible to most persons in this country. Yet it must languish, and remain *in statu quo* for many years, unless a mode can be devised to procure a loan, either at home or abroad, for a million of dollars. Till this loan is procured, and at a moderate interest, it would be unadvisable to expend a single dollar, since the canal cannot be productive without the whole distance being completed and well finished, which, from the number of locks and the distance of digging, may be done in seven years, but, in the opinion of the stockholders, will require ten. Hence, the interest on the capital gradually expended will considerably increase the cost; yet the amount necessary for finishing could easily be raised in Europe, and probably on very moderate terms, by proper application, but not without a fund pledged for its ultimate redemption at a distant period, and the punctual payment of half-yearly interest, or a guarantee, on these principles, from the United States. It is therefore the intention of the present stockholders to make an application to the Congress of the United States, during this session, if the public affairs will warrant the same, either for this guarantee of principal and interest till refunded by the company, or by a grant of a certain quantity of land, either as a gift or as a collateral security for this loan, which, in a certain given period, might be gradually paid off from the receipt of the tolls; which, it is presumed, might easily be done in fifteen years after the canal is finished.

I beg leave to send by the bearer a bundle containing pamphlets printed in 1795, giving full elucidation on this subject, which, agreeable to its direction, you will please to forward to the Secretary of the Treasury, with my best respects and wishes, to cause them to be delivered, agreeable to their direction, that this subject, so highly interesting to the nation, may be fully understood, when it cannot fail of meeting with national encouragement and assistance. Any further information on this subject I shall with pleasure communicate at any time.

I have the honor to be, with great respect and esteem, sir, your most obedient servant,

CHARLES G. PALESKE.

WILLIAM MCPHERSON, Esq., *Naval Officer, Philadelphia.*

An historical account of the rise, progress, and present state of the canal navigation in Pennsylvania, with an appendix, containing abstracts of the acts of the Legislature since the year 1790, *and their grants of money for improving roads and navigable waters throughout the State; to which is annexed an explanatory map.* [*See map annexed.*]

INTRODUCTION.

Commerce between the inhabitants of different countries, as regulated by the general laws of nature and nations, and by particular treaties, is the surest means of uniting all mankind in one happy bond of civilization, peace, and prosperity.

By commerce, in this enlarged sense of the word, "the whole world becomes as it were one single family." What nature has denied to the inhabitants of one climate is supplied by what she has liberally bestowed on another; and the superabundance of each becomes common stock.

What commerce, considered in this view, is to mankind in general, by means of foreign trade and external navigation, she is, in a smaller degree, to particular States and societies by means of inland navigation and good roads; whereby the produce of one part of the country, as the case may require, is easily exchanged for that of another, and the superfluities of the whole readily carried to the principal marts or seaports for exportation.

Without improvements of this kind, together with a good Government and laws for the encouragement of industry and protection of property, the inhabitants of countries rich by nature, capable of being bound together in one flourishing and civilized whole, sensible of a common interest, and rejoicing in the common prosperity, may continue long in a state of almost savage wretchedness and poverty, insensible to the benefits of social and civil life, contributing scantily to the relief of their own wants, and nothing to relieve the wants of others, or to increase the common stock of felicity in their own country and of the world in general.

When a country is well improved by means of good roads and canals, joining its principal rivers, and thus establishing a general inland communication; each district with its superfluity may, as already mentioned, purchase what it wants of another, and each be reciprocally furnished with all necessaries and commodities; and, therefore, improvements of this kind are among the strongest marks of the good policy of a nation.

Canals and water carriage in particular, (as is well observed by the writers on this subject,) "render land carriages and beasts of burthen less necessary; and they may be more profitably employed in tillage and agriculture. By canals dry and barren grounds are fertilized, and marshy and watery grounds are drained. By means of them manufactures require fewer hands and less expense; and traffic is extended and animates all parts of a country, procuring plenty and happiness to the individuals, and enlarging the power and strength of a State or sovereignty in general.

"In fine, by canals a people may be supplied" in their cities, towns, and elsewhere, "with grain, forage, fuel, materials for building, and also all other heavy and raw materials for manufactures, which otherwise would remain of little value at a distance from the place where they are wanted, because of the great expense commonly attending their transportation by carriages, &c. for a barge of a reasonable size, worked by two men and drawn by two horses, can transport seventy or eighty tons; which weight by any other carriage would have required forty men and about one hundred and sixty horses." This calculation is made for the canals in England, where by means of turnpikes, a level country, and improved roads, land carriage has a great advantage over any land carriage that can for many years be completed throughout the greatest part of the United States; and the calculations are also verified by considering the difference between land and water carriage in the immense commerce carried on by canals in Holland, France, and Italy. To estimate the difference of expense between land and water carriage in Pennsylvania, while our rivers continue in an unimproved state, is difficult. An estimate, however, was attempted for this purpose, founded on the most authentic documents, and laid before the Legislature in February, 1791,* as may be seen from page 838 to page 840 of the following papers, and was greatly in favor of water carriage. But when the canals now in operation shall be completed, even to the connexion of the city of Philadelphia with Presque Isle, on Lake Erie, (two short portages only excepted) the difference in favor of water carriage, it is probable, will be far greater than is estimated in England, Holland, France, and Italy, or indeed any other European country.

It is no wonder, then, that from the earliest stages of commerce in the old world, and even for the conveniency of military expeditions, and manœuvres both of attack and defence, canals for water carriage should have been among the first improvements made on the face of nature by the most powerful States, both ancient and modern.

Among the canals executed by the ancients, the first mentioned by historians is that which connected the Red Sea and the Mediteranean; by which it is said King Solomon passed with his fleet to join that of Hiram, King of Tyre, to proceed together to Ophir in search of gold, as in 1 Kings, chap. 9. Herodotus, Diodorus, and Strabo among the ancients, Delisle, Father Sicard, and Rollin among the moderns, have all borne testimony to the existence of this canal, and its ruins have been traced by sundry travellers; Rollin, in particular, gives the following account of it:

"The canal which joined the Red Sea and the Mediterranean is not one of the least advantages which the Nile afforded Egypt. This canal had its beginning near the town of Bubastus; it was one hundred cubits, that is, fifty yards broad, so that two boats could pass with ease, deep enough for the largest vessels, and above one hundred *stadia*, that is, fifty leagues long." But this canal, useful and extensive as it is said to have been, can hardly be compared in point of utility or extent to what may be anticipated in the future prospects of commerce in the United States by means of canals and rivers joining the tide waters of Delaware, Susquehannah, Potomac, Hudson river, &c. with the Ohio, Mississippi, the great Western lakes, and perhaps the South Sea itself.

It would be foreign to the main subject of the following papers to speak of the military canals of the Romans; such as the Fossa Mariana to draw subsistence by sea up the Rhone; the canal from the Isser (which empties into the Zuyderzee) to the Rhone and Rhine; the canal joining the river Nyne in England, near Peterborough, with the Witham below Lincoln. But it may be proper to observe, that even in a military as well as commercial view, it may be worthy of the United States of America to improve the natural advantages of their situation along our sea-coasts as well as in the internal parts of our country. For example, if it should ever be the misfortune of these States to be engaged in a foreign war, especially with maritime Powers, how easy and safe might a water communication be made from Rhode Island and the eastern States of New York; and from New York to Philadelphia, by joining the Millstone and other branches of the Raritan with the river Delaware and the city of Philadelphia; and then from Philadelphia down the Delaware, and (by a short cut of about four miles and a half below Newcastle) from the Delaware to Chesapeake bay, Baltimore, Annapolis, and the city of Washington, on Potomac; thence still by bays, canals, and cuts, through Virginia, North and South Carolina, to Savannah, in Georgia. In time of war, this might not only give a safe communication from one extremity of the United States to another,

* The plan of a more accurate estimate will be added to the report of the engineer for the year 1794 in subsequent papers.

similar to the communication from province to province and from town to town in Holland, free from the interruption of the privateers of a foreign enemy; but even in time of peace such a communication at certain seasons by vessels not fit for a coasting trade, and the danger of doubling capes and going out to sea might answer many commercial purposes, and make shorter and safer voyages. But this hint is only thrown out hastily, and by the by. We return to the subject of ancient and modern canals for internal navigation.

Next to the canals of the ancients already mentioned, and indeed superior in name to any of them, is the canal of China, begun about the end of the third century, which is said to be the source of immense riches, being constantly covered with a multitude of vessels and boats; by which one may travel within land from Pekin to the extremity of the empire, a space of six hundred leagues. "The principal canal discharges itself on both sides into a great number of others, which accommodate the most part of the towns and villages, and answer the conveniency of travellers and traffic. The small canals are again subdivided into a number of smaller to fertilize the neighboring plains. Travellers speak with ecstasy of this canal, and of the magnificence and beauty of the stone bridges over the same, the piers being so slender by the goodness of the materials, that the arches, which are very high, appear at a distance as if suspended in the air; and when many can be seen at once they form a prospect the most agreeable in the world: yet these ingenious people have not the use of locks and sluices, but by the help of ropes and pulleys draw their boats up dams of masonry, where there is a fall which is sometimes attended with great danger."

Of modern canals, those of France deserve particular notice. "As early as the reign of their Henry IV. the French became sensible of the great advantages the Dutch and Flemings enjoyed by joining rivers and seas by canals; and, therefore, conceived many projects of this kind. The most important of those executed are the following:

1. The canal for joining the Seine and Loire, which was the first made in that country, with locks and sluices to ascend and descend boats, without the labor and danger of ropes and pulleys, as in the ancient method.

2. The canal of Orleans, to aid the former, is of great importance to the city of Paris; and which meets the Loire a little above Orleans, and was finished in 1724, making the navigation of the Seine, from near Orleans, as good as can be desired.

3. But of all the great works executed in France, the canal of Languedoc, called also the canal of the two seas, is the greatest, and reflects more honor on Louis XIV. than all the victories and splendid acts of his reign. By means of this grand canal, a ready communication is made between the two fertile provinces of Guyenne and Languedoc, and, in consequence, between the Atlantic and Mediterranean. "It is sixty-four leagues long, and has one hundred and four locks, extending, in some places, for a mile together by a passage dug through rocks under ground. The expense was thirteen millions of livres, of which the king contributed seven millions, and the province of Languedoc the rest.—(See Savare Dict. Comm.) "And if the king, on the representation of Colbert, had not shared the expense, and magnificently given the perpetual revenues of it to the celebrated engineer, Mr. Riquet and his heirs, subject only to the sole charge of keeping it in repair, this great work had, perhaps, remained unfinished to this day. The States of Languedoc, with equal magnanimity, contributed their part, by a tax on that province, without any view to a share of the profits, excepting so far that they rightly considered the tax as continuing only for a time, but that the expenditures of the profits would be amongst themselves, and continue a permanent source of riches, increasing more and more, by the advantages they would reap from trade, added to that of obtaining, with ease, those things which they stood in most need of; and the event confirmed their expectations."

"The opposition which Mr. Riquet met with from the owners of the ground, through which the canal was to pass, being made known to Colbert, he thought the only way to avoid these difficulties was to engage the king to indemnify all those who might think themselves aggrieved; who, accordingly, took the canal into his own protection; bought the ground through which it was to pass; erected it into a fief, and gave the property to Mr. Riquet, as aforesaid."

A similar opposition has been made by some of the owners of lands on the route of the Pennsylvania canals; but this, it is hoped, may be overcome gradually by the good sense of the people: if not, the remedy is in the power of the Legislature, by an amendment of the incorporating acts, providing more effectually for a valuation, by good and lawful men, indifferent to the parties.

But to return to some further account of the Languedoc canal, which, traversing an immense tract of country, and joining two oceans by an entire inland navigation, bears the greatest similitude (although upon a shorter scale) to the canals proposed for joining the Atlantic ocean by means of the tide waters of Hudson river, the Delaware, Susquehannah and Potomac on the east, with Ohio or Mississippi, and the great lakes, which are in the nature of oceans, on the west.

The Languedoc canal (according to the account of Vallancey, an able engineer, whose authority is made use of in many parts of this introduction,) is "divided into two principal parts, running from its* point of partage, which is the most elevated spot in the neighborhood of Castlenaudari. The first, which extends ninety-six thousand three hundred and fifteen French fathoms towards the Mediterranean, descends from the point of partage to the Lake of Thau, near Agde, and passes from thence to the port of Cette in the Mediterranean. The second, which extends twenty-nine thousand three hundred and sixty-six fathoms, descends from the point of partage to the ocean, at its mouth, in the Garonne, below Toulouse; so that, between the two mouths of this grand canal, the whole extent is one hundred and twenty-five thousand six hundred and eighty-one fathoms, or fifty French leagues and a half. An exact level of the ground being taken, it was found that the point of partage was six hundred French feet higher than the Lake of Thau, which is on a level with the Mediterranean, and one hundred and eighty-six French feet above the mean height of the Garonne, taken immediately below Toulouse."

To pass the boats from the port of Cette up to the point of portage, there are seventy-four locks,† of about eight feet fall each; and twenty-six locks from the same point to the Garonne, which is navigable from Toulouse to the

* The point of partage is that point on the summit of some mountain, or highest middle ground, where the waters, head springs, or sources of different great rivers rise, and, dividing themselves, run different ways. Thus, in the navigation from Philadelphia, by means of the Schuylkill, Susquehannah, and Juniata rivers on the east side, and the Conemaugh, Kiskeminetas, Allegany and its branch, called French creek, on the west side, (see the map,) by which the tide waters of Delaware may be connected with Lake Erie, and the other great lakes, at *Presque Isle*, and with the Mississippi waters, at the heads of Conemaugh. The point of partage is on a fine level on the Allegany mountain, where large springs running eastward into the Juniata branch of Susquehannah, and westward into the Conemaugh branch of Allegany river, and consequently of the Ohio and Mississippi, are but a few rods apart; and the present carrying place, from the mouth of Poplar run, on Juniata, to the forks of Little Conemaugh, less than sixteen miles.

† To pass from the summit level of the Schuylkill and Susquehannah canal to the mouth of Tulpehocken on Schuylkill eastward, in the distance of near thirty-five miles, the fall is three hundred and ten feet, proposed to be divided into forty-five locks; the descent from the west end of the summit level to the Susquehannah, at the mouth of its Swatara branch, has not been finally ascertained, nor, consequently, the number of locks, should it be eventually necessary to make a canal and locks the whole way, and every where to quit the bed of the river.

ocean; so that this canal contains one hundred great locks. The only difficulty in the accomplishment of this work (for the ground is level and of a good kind) was the expense which was supplied as above stated.

Of these one hundred locks, the most beautiful are the eight locks together, near Beziers, which form one continued cascade of one hundred and fifty fathoms long and sixty-six French feet fall; that is, eight feet three inches fall to each lock. Similar to this, and equally beautiful, are the five locks together, at the east end of the summit level of the Schuylkill and Susquehannah canal, between Myers-town, near the head of the Tulpehocken branch of Schuylkill, and Lebanon, at the head of the Quittapahilla and Swatara branch of Susquehannah. Here there is thirty feet fall, that is, six feet fall to each lock, comprised in the distance of three hundred and seventy feet; by which junction there is a saving of about a fifth of the expense which would have been requisite in the construction of so many locks separately.

In the route of the Languedoc canal, there are several hills and mountains in the aforesaid space of fifty leagues which the canal was to cross; all of which are cut through, except that of Malpas, which, being very high and rocky, is hollowed or tunnelled in the form of a vault, with a foot bank four feet broad, to draw the boats along. This work passes for as extraordinary and noble a thing as any of the ancient Romans.

This canal (of Languedoc) is sixty feet broad at top, thirty feet at bottom, and six feet deep. At the point of partage there is a great basin, called Narouse, of an octangular form, being four hundred yards long, three hundred broad, and seven feet deep—its sides lined with masonry. The greatest difficulty in joining the two seas by means of this canal, was thought to be that of finding a sufficient quantity of water at the point of partage to supply a continual navigation of fifty leagues, because of the inevitable loss by the gates, the oozing, and evaporation. It was here that Riquet gave proof of his superior abilities, for providing for so essential an article, by the reservoir* of St. Farriol—the greatest work that has been executed by the moderns; this he accomplished by means of a trench collecting the waters which rise and descend from the Black Mountain into the grand reservoir at the summit level, or point of partage. The waters of this reservoir run out through large brass cocks, which communicate with vaulted galleries, made at the bottom of the dam, one hundred feet below the surface.

In constructing this grand canal they inevitably crossed many rivers and rivulets; and then thought of no other expedient than to bring them into it, and let them overflow again at particular places, that they might always keep a sufficient depth of water for the navigation; and, so far from thinking these foreign waters an inconvenience, they were considered as proper to supply what was lost by evaporation. At the end of some years they found their error; for the mud, which these foreign waters brought into the canal, increased so fast, that the canal would not have remained long navigable, had not the celebrated engineer Vauban found means to separate these foreign waters from the canal, and to let in as much of them as they pleased, and when they thought proper. This he completed by back drains, or side ditches, and aqueducts of his own invention—there are forty-five of these on this canal, which are of two kinds; the first, called aqueduct bridges, raised on arches, to support the canal, under which pass these foreign rivers and waters. There are thirty-nine others, passing syphon-wise† from one side ditch to another under the canal. There are many other canals, which it would be needless to describe on this occasion; such as that of Grave, navigable to Montpelier, and from thence, by the river Lez, to the sea; that of Lunel, emptying itself likewise into the sea; those of Radelle, Burgogne, and Silvestal, communicating from Aiguemote, on the Rhine, to the sea; the canal of Movella, crossing the lakes of Salees, Palme, and Signeau, from the neighborhood of Perpignan to Narbonne, from thence to the river Aude, within one league of the great canal; the whole facilitating one great and various communication, from the mouth of the Rhone to Perpignan, and to the ocean, without running any risks by sea.

It would be likewise needless to describe, or even to attempt, on this occasion, to enumerate all the canals made in Holland and the Netherlands within the two last centuries, for the benefit of commerce. The whole country exhibits one chain of water-carriage, for profit as well as pleasure, from port to port, and from town to town, and from village to village, through these countries. "Even under the government of a woman, Elizabeth Eugenia, in the low countries, one hundred and seventy years ago, the famous canal of St. Mary was made; which joins the Rhine and the Meuse, extending from Rheinberg to Vanlo, in order to transport all the merchandise which comes from Germany into Brabant, and to deprive the Dutch of that trade. Foreseeing the jealousy that this work would create amongst her Dutch rivals in trade, she caused it to be fortified by twenty-four redoubts of defence, to support the workmen, in case they should be molested; and although the Prince of Orange attacked them several times, he could not prevent the work from being perfected.

"In addition to this, it may not be improper to mention the exertions of the Czar, Peter I.; who, of all the sovereigns who have endeavored to polish and enrich an almost barbarous multitude of subjects, justly merited the title of Great. This Prince travelled through England, Holland, Germany, and France, to instruct himself in military discipline, trade, navigation, and the art of Government; and having engaged many learned and skilful persons of foreign nations in his service, contemplated, in imitation of France, by internal navigation, to join the seas which surrounded his kingdom.

"The principal rivers of Russia are the Dwina, which falls into the White sea; the Don, into the Baltic; and Wolga, into the Caspian sea. The Czar thought that the junction of these rivers by canals would give his subjects a communication with all the seas; and after going himself over this vast tract, having taken all the levels, resolved on the places of the canals for their junction; in a word, having planned every thing for so great a project, he began by the junction of the Wolga with Wolkava, which empties into Lake Ladoga, running by Petersburg, into the Baltic sea. In this manner, it was practicable to cross all Russia by water, which is above eight hundred leagues from the Baltic to the Caspian sea. The intention of this monarch was, that Petersburg, by its favorable situation, should become a magazine for the commerce of the whole world; which would probably have happened, if he had not died in one thousand seven hundred and twenty-five, before the completion of his projects."

In England, Scotland, and Ireland, it may be unnecessary to observe what facilities have been given to trade and commerce, by means of roads and canals—mountains have been traversed and levelled for land-carriage, and, where necessary, perforated for water-carriage; rivers running contrary courses, and seas washing opposite shores, have been made to embrace each other; and an easy and cheap inland navigation formed through all parts of the insular dominion. The joining the friths of Forth and Clyde, in Scotland, and the Duke of Bridgewater's navigation, not to mention a multitude of others, in England, might be adduced as examples. Of the latter, namely, the Duke of Bridgewater's, the republication of a short extract from Memoirs of the Life of Mr. James Brindley, may

* This reservoir is said to contain a body of water, whose superficies is two millions three hundred and forty thousand square feet, and one hundred feet depth, which makes above one million cubic fathoms of water. The reservoir and locks, on the summit level of the Schuylkill and Susquehannah canal, are supplied by the head springs of Tulpehocken, which empties into the Schuylkill branch of Delaware, and the head springs of the Quittapahilla and Swatara branch of Susquehannah. An estimate of the quantity of water which these head springs will carry into the reservoir at the summit level will be found in the following papers.

† Commonly called culverts.

be proper to show that neither mountains nor valleys, rivers nor marshes, can be any long impediment to skill and perseverance, supplied and supported by adequate finances.

"The Duke of Bridgewater hath, at Worsley, about seven miles from Manchester, a large estate, rich with mines of coal, which had hitherto lain useless in the bowels of the earth, because the expense of carriage was too great to find a market for consumption.

"The duke, wishing to work these mines, perceived the necessity of a canal from Worsley to Manchester: upon which occasion, Mr. Brindley, who was now become famous in the country, was consulted. Having surveyed the ground, he declared the scheme to be practicable. In consequence of this, an act was obtained in the years 1758 and 1759, for enabling the duke to cut a canal from Worsley to Salford, near Manchester, and to carry the same to, or near, Hollin ferry, in the county of Lancaster. It being, however, afterwards discovered, that the navigation would be more beneficial, both to the Duke of Bridgewater and the public, if carried over the river Irwell, near Barton bridge, to Manchester, he applied again to Parliament, and procured an act, which enabled him to vary the course of the canal agreeably to this new plan, and likewise to extend a side branch to Longford bridge in Setford. Mr. Brindley, in the mean time, had begun these great undertakings, being the first of the kind ever attempted in England, with navigable subterraneous tunnels, and elevated aqueducts. The principle laid down at the commencement of this business reflects much honor on the noble undertaker, as well as upon his engineer. It was resolved that the canal should be perfect in its kind, and that, in order to preserve the level of the water, it should be free from the usual obstructions of locks; but, in accomplishing this end, many difficulties occurred, which were deemed unsurmountable. It was necessary that the canal should be carried over rivers, and many large and deep valleys, where it was evident that such stupendous mounds of earth must be raised as could scarcely, it was thought, be completed by the labor of ages; and above all, it was not known from what source so large a supply of water could be drawn, as, even upon this improved plan, would be requisite for the navigation: but Mr. Brindley, with a strength of mind peculiar to himself, and being possessed of the confidence of his great patron, conquered all the embarrassments thrown in his way, not only from the nature of the undertaking itself, but by the passions and prejudices of interested individuals, and the admirable machines he contrived, and the methods he took to facilitate the progress of the work, brought on such a rapid execution of it, that the world began to wonder how it could have been esteemed so difficult.

"When the canal was completed as far as Barton, where the Irwell is navigable for large vessels, Mr. Brindley proposed to carry it over that river, by an aqueduct of thirty-nine feet above the surface of the water. This, however, being generally considered as a wild and extravagant project, he desired, in order to justify his conduct towards his noble employer, that the opinion of another engineer might be taken; believing that he could easily convince an intelligent person of the practicability of his design. A gentleman of eminence was accordingly called in; who, being conducted to the place where it was intended that the aqueduct should be made, ridiculed the attempt; and when the height and dimensions were communicated to him, he exclaimed, 'I have often heard of castles in the air, but never before was shown where any of them were to be erected.'

"This unfavorable verdict did not deter the Duke of Bridgewater from following the opinion of his own engineer. The aqueduct was immediately begun; and it was carried on with such rapidity and success, as astonished all those who had but a little before condemned it as a chimerical scheme.

"This work commenced in September, 1760; and the first boat sailed over on the 17th July, 1761. From that time, it was not uncommon to see a boat loaded with forty tons drawn over the aqueduct, with great ease, by one or two mules; while below, against the stream of the Irwell, persons had the pain of beholding ten or twelve men tugging at an equal draught; a striking instance of the superiority of a canal navigation over that of a river not in the tide way. The works were then extended to Manchester, at which place, the curious machines for landing coal upon the top of the hill, gives a pleasing idea of Mr. Brindley's address in diminishing labor by mechanical contrivances.

"The Duke of Bridgewater perceiving, more and more, the importance of these inland navigations, not only to himself in particular, but to the community in general, extended his ideas to Liverpool; and though he had every difficulty to encounter, that could arise from the novelty of his undertakings, his grace happily overcame all opposition, and obtained, in 1762, an act of Parliament for branching his canal to the tide way of the Mersey. This part of the canal is carried over the Mersey and Bollen, and over many wide and deep valleys. Over the valleys it is conducted without the assistance of a single lock: the level of the water being preserved by raising a mound of earth, and forming therein a channel for the water across the valley at Setford, through which the Mersey runs: this kind of work extends nearly a mile.

"A person might naturally have been led to conclude, that the conveyance of such a mass of earth must have employed all the horses and carriages in the country, and that the completion of it would be the business of an age. But our excellent mechanic made his canal subservient to this part of his design, and brought the soil in boats of a peculiar construction, which was conducted into caissons or cisterns. On opening the bottom of the boats, the earth was deposited where it was wanted; and thus, in the easiest and simplest manner, the valley was elevated to a proper level for continuing the canal. The ground across the Bollen was raised by temporary locks, which were formed of the timber used in the caissons, just mentioned. In the execution of every part of the navigation, Mr. Brindley produced many valuable machines, which ought never to be forgot in this kingdom; nor ought the economy and forecast, which are apparent through the whole work, to be omitted, in the stops or floodgates, fixed in the canal where it is above the level of the land. The stops are so constructed that, should any of the banks give way, and thereby occasion a current, the adjoining gates will rise by that motion only, and prevent any other part of the water from escaping, except that which is near the breach between the two gates. The success with which the Duke of Bridgewater's undertakings were crowned encouraged a number of gentlemen, and manufacturers, in Staffordshire, to revive the idea of a canal navigation through that country, for the conveying to market, at a cheaper rate, the products and manufactures of the interior parts of the kingdom. This plan was patronized by Lord Gower and Mr. Anson; and met with the concurrence of many persons of rank, fortune, and influence in the neighboring counties. Mr. Brindley was, therefore, engaged to make a survey from the Trent to the Mersey; and, upon his reporting that it was practicable to construct a canal from one of those rivers to the other, and thereby to unite the ports of Liverpool and Hull, a subscription for carrying it into execution was set on foot in 1765, and an act of Parliament* was obtained in the same year.

"In 1766, this canal, called by the proprietors "the canal from the Trent to the Mersey," but more emphatically by the engineer, "the grand trunk navigation," on account of the numerous branches which he justly supposed

* He was the greatest enthusiast in favor of artificial navigations that ever existed. Having spoken upon various circumstances of rivers before a committee of the House of Commons, in which he seemed to treat all sorts of rivers with great contempt, a member asked him, for what purpose he apprehended rivers were created? Brindley, considering with himself a little before he gave an answer, replied at last, "to feed navigable canals."

would be extended every way from it, was begun, and under his direction conducted with great spirit and success as long as he lived. Mr. Brindley's life not being continued to the completion of this important and arduous undertaking, he left it to be finished by his brother-in-law, Mr. Henshall, who put the last hand to it in May, 1777, being somewhat less than eleven years after its commencement. We need not say that the final execution of the grand trunk navigation gave the highest satisfaction to the proprietors, and excited a general joy in a populous country, the inhabitants of which already receive every advantage they could wish from so truly noble an enterprise.

"This canal is ninety-three miles in length, and, besides a large number of bridges over it, has seventy-six locks and five tunnels. The most remarkable of the tunnels is a subterraneous passage of Harecastle, being two thousand eight hundred and eighty yards in length, and more than seventy yards below the surface of the earth. The scheme of this inland navigation had employed the thoughts of the ingenious part of the kingdom for upwards of twenty years before, and some surveys had been made; but Harecastle hill, through which the tunnel is conducted, could neither be avoided nor overcome by any expedient the ablest engineers could devise. It was Mr. Brindley alone who surmounted such difficulties, arising from the variety of minerals, strata, and quicksands, as no one but himself would have attempted to conquer.

"Soon after the navigation from the Trent to the Mersey was undertaken, application was made to Parliament by the gentlemen of Staffordshire and Worcestershire, for leave to construct a canal from the grand trunk, near Haywood, in Staffordshire, to the river Severn, near Bewly. The act being obtained, the design was executed by our great engineer; and hereby the port of Bristol was added to the two before united ports of Liverpool and Hull. This canal, which is about forty-six miles in length, was completed in 1772. Mr. Brindley's next undertaking was the survey and execution of a canal from Birmingham, to unite with Staffordshire and Worcestershire canal near Wolverhampton. This navigation, which was finished in about three years, is twenty-six miles in length. As by means of it vast quantities of coal are conveyed to the river Severn, as well as to Birmingham, where there must be a peculiar demand for them, extraordinary advantages have accrued to manufactures and commerce.

"Our engineer advised the proprietors of the last mentioned navigation, in order to avoid the inconvenience of locks, and to supply the canal more effectually with water, to have a tunnel at Smethwick. This would have rendered it a complete work. But his advice was rejected; and to supply the deficiency, the managers have lately erected two of Messrs. Watts and Boulton's steam engines. The canal from Droitwich to the river Severn, for the conveyance of salt and coal, was likewise executed by Mr. Brindley. By him, also, the Coventry navigation was planned, and it was a short time under his direction.

"The canal from Chesterfield to the river Trent, at Stockwith, was the last public undertaking in which Mr. Brindley was engaged.

"And notwithstanding some of the canals passed through the fine villas and extensive lawns of many gentlemen's retreats, yet their magnanimity induced them to sacrifice their private convenience for public utility.*

"He surveyed and planned the whole, and executed some miles of the navigation which was successfully finished by Mr. Henshall in 1777.

"The last of our great mechanic's ingenuity and uncommon contrivances that we shall mention, is his improvement of the machine for drawing water out of mines, by a losing and gaining bucket. This he afterwards employed to advantage in raising up coal from the mines."

P. S. Upon an extensive view of the natural advantages which Pennsylvania enjoys for improvements of this kind, a few of her citizens, in the year 1789, united by the name of "the Society for promoting the improvement of Roads and Inland Navigation;" and the number of members soon increased to more than one hundred, residing in various parts of the State, whose meetings were to be on every Monday evening, during the session of the Legislature, in order to suggest information, schemes, and proposals for promoting internal trade, manufactures, and population, by facilitating every possible communication between the different parts of the State.

The following are the principal memorials which have hitherto been acted upon by the Legislature, so far as concerns land and water carriage.

To the honorable the Senate and House of Representatives of the freemen of the commonwealth of Pennsylvania, in General Assembly met. The memorial of "The Society for promoting the improvement of Roads and Inland Navigation," respectfully showeth:

That your memorialists, residing in various parts of this State, with a view to contribute their best endeavors to promote the internal trade, manufactures, and population of their counrry, by facilitating every possible communication between the different parts of the State, have lately formed themselves into a society by the name above mentioned. And knowing that the Legislature, with the laudable intention of advancing the best interests of this commonwealth, and availing themselves of the extensive information which they have obtained of the geography and situation of the country, have now under their consideration the important subject of roads and inland navigation, we therefore beg leave, with all possible deference, to suggest some important considerations which have occurred to us in our inquiries into this subject.

Pennsylvania, from her situation and extent of territory, is a respectable commonwealth in the Union. Her soil is fertile, her products various, and her rivers, by the bountiful author of nature, have been made to flow in every direction, as if on purpose to bear from all parts the wealth and produce of the land, in an easy, cheap and expeditious manner, to her principal mart and port in the city of Philadelphia. To combine the interests of all the parts of the State, and to cement them in a perpetual commercial and political union, by the improvement of those natural advantages, is one of the greatest works which can be submitted to Legislative wisdom; and the present moment is particularly auspicious for the undertaking, and if neglected, the loss will be hard to retrieve.

When once our trade hath forced its way, even through a less advantageous channel, it is difficult to alter its course, and a little expense, judiciously and seasonably applied, may retain a stream in its channel which, with immense sums, cannot be restored, if once diverted from it. Large emigrations from Europe are now directing their course to this country, and will be encouraged by every improvement we make, by means of roads and water communications with the distant parts of the State. The constant influx of settlers from the Eastern States, is also a considerable object. Being stopped for the present by the Indian disturbances from swarming into the Western territory, many of them may be encouraged to make a halt or settlement in this State, if they find good roads and communications in the different parts thereof.

It may be proper, therefore, before we proceed further, to subjoin a general statement of the various communications and improvements of which Pennsylvania is capable in this way, so far as relates to navigation.

*Persons were offered to be appointed to value the ground, and assess damages, which they refused.

DELAWARE NAVIGATION.

	Miles.	Chains.	Total miles.	Total chains.
No. 1. *From the tide water at Trenton Falls to Lake Otsego, the head of the north-east branch of the Susquehannah.*				
From Trenton falls to the mouth of Lehigh at Easton,	50	15	50	15
To Lechewacksin branch of Delaware,	94	12	144	27
Thence to Stockport, on the Delaware, a little below the junction of the Mohawk and Popachton branches,	66	24	210	51
Portage from Stockport to Harmony, at the great bend,	20	00	230	51
Thence up the northeast branch of Susquehannah, to Otsego lake,	70	00	300	51
No. 2. *From the tide water on Delaware to Oswego, on Lake Ontario.*				
To Harmony, at the great bend of Susquehannah, as above,	230	51	230	51
Down Susquehannah to the mouth of Tioga,	65	00	295	51
Up Tioga to Newtown,	18	00	313	51
Portage to Conedessago lake, which may be turned wholly into lock navigation by Newtown creek,	18	00	331	51
Down Conedessago lake,	36	00	367	51
Down Seneca or Onandago river to Oswego,	86	00	453	51

Estimate of the expense of opening this navigation from Trenton Falls to Stockport, near the State line.

From Trenton falls to the mouth of Lehigh,	£1,005
From Lehigh or Easton to Stockport,	1,243
Portage from Stockport to Harmony, at £20 per mile,	400
	£2,648

SUSQUEHANNAH NAVIGATION,

As connected with the Schuylkill on the east, and Ohio and the great lakes on the west.

	Miles.	Chains.	Total miles.	Total chains.
No. 1. *From Philadelphia, or the tide waters of the Schuylkill, to Pittsburgh, on the Ohio.*				
Up Schuylkill to the mouth of Tulpehocken,	61	00	61	00
Thence up Tulpehocken to the end of the proposed canal,	37	09	98	09
Length of the canal,	4	15	102	24
Down Quittapahilla to Swatara,	15	20	117	44
Down Swatara to Susquehannah,	23	00	140	44
Up Susquehannah to Juniata,	23	28	163	72
Up Juniata to Huntingdon,	86	12	250	04
From Huntingdon, on Juniata, to the mouth of Poplar run,	42	00	292	04
Portage to the Canoe Place on Conemaugh,	18	00	310	04
Down Conemaugh to Old Town at the mouth of Stony creek,	18	00	328	04
Down Conemaugh and Kiskeminetas to Allegany,	69	00	397	04
Down Allegany river to Pittsburgh on the Ohio,	29	00	426	04

Estimate of the expense of clearing this navigation from Philadelphia to Pittsburgh.

Schuylkill, from the tide water, to Reading, by David Rittenhouse and others,	£1,147 0s.
By Benjamin Rittenhouse and John Adlum,	1,519 13
Clearing the Tulpehocken, by do.	1,419 9
The canal from Tulpehocken to Quittapahilla, 20 feet wide and 7 feet deep on an average.*	
The Quittapahilla and Swatara,	18,900 0
Susquehannah, from Swatara to Juniata,	300 0
The Juniata to Frank's town,	2,320 0
Canal or lock navigation to Poplar run, (if found necessary, which probably will not be the case,)	7,000 0
Portage of 18 miles to Conemaugh, at £20 per mile,	360 0
Conemaugh and Kiskeminetas to Allegany,	7,150 0
Total expense from Philadelphia to Pittsburgh, being four hundred and twenty-six miles.	

No. 2. *From Philadelphia to Presque Isle, on Lake Erie, by the Juniata and Kiskeminetas, &c.*				
To the mouth of Kiskeminetas, by the same route as above,	397	04	397	04
Up the Allegany to French creek,	83	43	480	47
Up French creek to Le Bœuf,	65	40	546	07
Portage from Le Bœuf to Presque Isle,	15	40	561	47

N.B. The sum of £500 for French creek, and £400 for the portage, is all the additional expense in the navigation from Kiskeminetas to Presque Isle or the lakes.

* The society have left a blank for the estimate of the canal, as they mean to inquire further whether it cannot be done cheaper upon a plan of lock navigation.

SUSQUEHANNAH NAVIGATION—Continued.

	Miles.	Chains.	Total miles.	Total chains.
No. 3. *From Philadelphia to Presque Isle, by the west branch of Susquehannah, Sinnemahoning, and Conewango.*				
From Philadelphia to Swatara, as above,	140	44	140	44
Up Susquehannah to the west branch at Sunbury,	65	00	205	44
Up the west branch to the mouth of Sinnemahoning,	106	00	311	44
Up Sinnemahoning to the forks,	15	20	326	64
Up the north branch of the Sinnemahoning,	19	40	346	24
By the portage to the head of Allegany river,	23	00	369	24
Down Allegany river (partly through New York State) to the mouth of Conewango,	76	00	445	24
Up Conewango to New York line 11 miles—thence, up the same, through the State of New York, 17 miles, to Chataughque lake,	28	00	473	24
Across Chataughque lake to its head,	17	00	490	24
Portage to Lake Erie at the mouth of Chataughque creek,	9	20	499	44
Along Lake Erie to Presque Isle,	25	00	524	44
No. 4. *From Philadelphia to Presque Isle, by the west branch of Susquehannah, Sinnemahoning, and Toby's creek.*				
From Philadelphia to the forks of Sinnemahoning, as above,	326	64	326	64
Up the west branch of Sinnemahoning,	24	00	350	64
Portage to Little Toby's creek,	14	00	364	64
Down Little Toby's creek to the main branch,	10	00	374	64
Down the main branch of Toby's creek to the Allegany,	70	00	444	64
Up the Allegany to French creek,	35	00	479	64
Up French creek and the Portage to Presque Isle,	81	00	560	64
No. 5. *From the tide waters of Susquehannah to Pittsburgh.*				
From Thomas's, near Susquehannah ferry, to the mouth of Swatara,	54	00	54	00
From the mouth of Swatara, as above, to Pittsburgh,	285	40	339	40
No. 6. *From the tide waters of Potomac, at Georgetown, to Pittsburgh.*				
From Georgetown to Williamsport at the mouth of Conecocheague,	98	15	98	15
From Williamsport to Fort Cumberland,	93	36	191	51
From Fort Cumberland to the mouth of Savage river,	30	44	222	15
Portage from the mouth of Savage river on the Potomac to Dunkard Bottom on Cheat river,	37	20	259	35
Down Cheat river to Monongahela,	25	00	284	35
Down Monongahela to Pittsburgh,	102	00	386	35
No. 7. *From Conedessago lake to New York.*				
From Geneva, at the outlet of Conedessago lake, by Seneca river, to the Three Rivers,	62	00	62	00
To the Oneida lake,	28	00	90	00
Up the Oneida lake to Wood creek,	18	00	108	00
By Wood creek, (a very crooked course 25 miles, but supposed longer,)	30	00	138	00
Portage to the Mohawk river,	1	00	139	00
To the rapids or falls of the Mohawk river,	60	00	199	00
Portage,	1	00	200	00
Down the Mohawk river to Schenectady,	55	00	255	00
Portage to Albany,	15	00	270	00
By Hudson river to New York,	165	00	435	00
No. 8. *From the middle of the Genesee country to New York.*				
Down Genesee river to Lake Ontario,	30	00	30	00
Along Lake Ontario to Oswego,	60	00	90	00
From Oswego to the Three Rivers,	24	00	114	00
From thence to New York, as above,	373	00	487	00
No. 9.				
From Conedessago lake, by the portage, and by Tioga and Susquehannah, to the mouth of Swatara,	260	00	260	00
Thence to Philadelphia, as above,	140	00	400	00
No. 10.				
From Conedessago, by Tiago and Susquehannah, to the great bend,	101	00	101	00
The portage to Stockport, and down the Delaware to tide water,	230	51	331	51
To Philadelphia,	34	00	365	51

On the inspection of the map hereunto annexed, compared with the foregoing statement of distances and water communications, as they may be improved to connect the western waters of the Susquehannah, the Ohio, and great lakes, with the port of Philadelphia, an almost unbounded prospect of future wealth and importance opens to the citizens of this commonwealth. That this subject may be better comprehended in detail, give us leave to consider it under two great heads.

First, The Delaware navigation, as stated in Nos. 1 and 2, by which the countries on the waters of the north-east branch of Susquehannah up to its head at Lake Otsego, and all the countries lying from the mouth of Tioga to Lake Ontario, may be connected with the city of Philadelphia; having only twenty miles portage from Stockport on Delaware to Harmony, at the great bend of Susquehannah, in the whole distance of three hundred miles and a half from the tide water of Delaware to Lake Otsego; and only eighteen miles more in the much larger distance of four hundred and fifty-three miles and a half from the same tide waters to Oswego on Lake Ontario.

The expense of this whole navigation, by the estimate annexed, is only—

For the river Delaware, - - - - -	£2248 0
The portage of twenty miles, - - - -	400 0
And the Tioga waters and portage, about - - - -	

But as the Tioga waters, and the communications from thence to Lake Ontario, lie within the State of New York, it is probable they will not be improved by that State, unless it can be done with a view to draw the trade of that country by the Oneida lake, Wood creek, &c. into Hudson river, and even when that shall happen, by a happy rivalship between the cities of Philadelphia and New York, to draw the trade of those vast countries to their respective ports, a great part of it will come with more ease to the former than to the latter; and while the waters are left in their present unimproved state, every advantage is on the side of Pennsylvania, by means of the navigation down the Tioga, and then either down Susquehannah to the mouth of Swatara, and thence to Philadelphia by the waters of Swatara, Quittapahilla, Tulpehocken, and Schuylkill; or from the mouth of Tioga up Susquehannah to the great bend, and thence by the portage to Stockport, and by Delaware to Philadelphia. Taking Conedessago lake as a central place of embarcation for the settlers in the Genesee country, the distance to the city of New York will be four hundred and thirty-five miles (see No. 7,) whereof seventeen miles are land carriage; and the distance to Philadelphia, by Delaware, (see No. 2,) will be three hundred and thirty-one miles; or by Swatara and Schuylkill (see No. 9,) will be four hundred and one miles. Or if the middle of the Genesee settlement, on the Genesee river, be taken as the place of beginning, the distance to New York will be four hundred and eighty-seven miles, whereof * seventeen miles are land carriage, (see No. 8,) and the distance to Philadelphia three hundred and sixty-five miles and a half (see No. 10,) whereof thirty-eight miles are land carriage.

Connected with the Delaware navigation, we beg leave further to add, that above Stockport, the Mohawk and Popaughton branches, are each navigable for boats of fifteen tons for more than fifty miles above their junction, and considerably higher still for rafts. The Lehigh and Lechawacksen, likewise offer themselves as very important branches of this navigation, lying in the interior parts of the State, but nothing need be added to the report of the commissioners on this head. We proceed, therefore, to the second great and most important head, viz:

The Susquehannah navigation, as it may be connected with the Schuylkill waters on the one hand, and the Ohio waters and great lakes on the other. Here is a navigation which we may properly call our own, passing through the most inhabited and central parts of the State; in which we can have no rivals, if duly improved, and opening such numerous sources and channels of inland trade, all leading to the port of Philadelphia, as perhaps no other nation or sea-port on the whole globe can boast of.

For, in the first place, if we turn our view to the immense territories connected with the Ohio and Mississippi waters, and bordering on the great lakes, it will appear from the table of distances, that our communication with those vast countries, (considering Fort Pitt as the port of entrance upon them,) is as easy and may be rendered as cheap as to any other port on the Atlantic tide waters. The distance from Philadelphia to the Allegany, at the mouth of Kiskeminetas, is nearly the same as from the mouth of Monongahela to Georgetown, on Potomac; and supposing the computed distances from Pittsburg to the Dunkard bottom to be just, and the navigation of Cheat river, on the one hand, and the Potomac, at the mouth of Savage river, on the other, to be, at all seasons of the year, equal to the navigation of the Kiskeminetas, Conemaugh, and Juniata, yet as the portage from Dunkard bottom to the Potomac, at the mouth of Savage river, is thirty-seven miles and a quarter, and the portage from Conemaugh to Juniata only eighteen miles, (which may be considerably shortened by locks,) there can be no doubt but that the transportation of all kinds of goods and merchandise from Philadelphia to Pittsburg may be at a much cheaper rate than from any other sea-port on the Atlantic waters.

This is not mentioned with a view to disparage the internal navigation of our sister States, more especially Maryland and Virginia. We admire their noble exertions to improve the natural advantages of their country, and desire to imitate and emulate them. Every improvement, and every new communication with the Western territories, promoted by any of the United States, by which the trade of the lakes, the Ohio and Mississippi waters can be drawn to our sea-ports, is a benefit to the whole Union. By no other methods than by opening easy communications, both by good roads and safe water carriage, can the settlers in those vast Western countries be made useful to the Atlantic States, and comfortable in their own situation. Nor can we expect by any other means than by inviting their trade, and making it their interest to be connected with us, that we can long secure such connexion. But although a considerable part of the settlers on the Ohio waters may be accommodated by the Potomac navigation, and the State of Pennsylvania may only have a share in the trade of those waters; yet there remains to us the immense trade of the lakes, taking Presque Isle, which is within our own States, as the great mart or place of embarcation. Here there can be no competition in respect to the distances or the fease of water carriage, between the port of the Philadelphia and any other port on the Atlantic tide waters, whichsoever of the three communications, between Philadelphia and Presque Isle, we may choose to pursue.

Of these three communications, it is of importance to choose the best in the first instance, and not to neglect the improvement of it; nor to entertain doubts and delays, till the opportunity of receiving benefit from it be entirely lost, and the trade of those vast countries drawn into other channels.

We shall speak first of the communication with Presque Isle, by the Chadaughque lake, the Conewango river, part of Allegany, the Sinnemahoning, Susquehannah, Swatara, and Schuylkill, (see No. 3,) which appears to be the shortest, being about five hundred and twenty-four miles and a half. The navigation of the Conewango and north branch of Sinnemahoning, according to the report of the commissioners, may be made very good, and is, on that account, as well as the shortness of the distance, preferable to that by way of Toby's creek and west branch of Sinnemahoning. But a considerable part of this communication lies through the State of New York, in a yet unsettled country; and although it leads, in the most direct way, to Presque Isle and the great lakes, it cannot be of any great use in the main communication with the Ohio and Mississippi by the way of Pittsburg, which is the great object of present consideration.

* In this route to New York there are the same portages, viz. seventeen miles, as in the other from the Conedessago lake supposing Genesee river could be made navigable; but it is doubtful whether it can be made useful in navigation, having many falls, and one of them sixty feet.

The second route from Philadelphia to Presque Isle, by the west branch of Susquehannah, as connected with Swatara and Schuylkill, and by the Sinnemahoning and Toby's creek, being five hundred and sixty miles and a quarter, (see No. 4,) passes indeed wholly through our own State; but besides what has been already mentioned concerning the waters of Toby's creek, compared with the Conewango and Chadaughque lake, this navigation could be of no further use than the former, in respect to the main communication with Pittsburg, as the mouth of Toby's creek lies fifty miles higher on the Allegany than the mouth of Kiskeminetas; and even with respect to Presque Isle, the navigation from Philadelphia, by the way of the Juniata and Kiskeminetas, is as short as by the way of Toby's creek, the latter being five hundred and sixty miles and three-quarters, as mentioned above, and the former five hundred and sixty-one miles and a half.

Third. This third communication, then, is that which embraces all present interests. It connects Philadelphia with Pittsburg and all the Ohio waters, by the Schuylkill, the Swatara and Juniata branches of Susquehannah, and the Kiskeminetas branch of Allegany, with the distance of five hundred and sixty-one miles and a half, (see No. 2,) and also Philadelphia and Presque Isle, using the same waters as above, to the mouth of Kiskeminetas, and then by the easy waters of Allegany and French creek. In this whole communication to Pittsburg, there are only eighteen miles portage between the Juniata and Conemaugh, which may be considerably reduced, as is said before, and only the addition of fifteen miles and a half more at the portage from Le Bœuf to Presque Isle, which portage is likewise included in both the other communications. In this statement of portages, it is supposed that the canal or lock navigation between the heads of Tulpehocken and Quittapahilla is to be completed; but if that work should be thought too great to begin with, it will be only the addition of four miles portage, by an excellent and level road.

The navigation by this route we beg leave to recommend to the Legislature, as one of the first and greatest works which they can undertake for the honor and advantage of their country. It is a work within their reach; a work in which not only the citizens of this State, but of the United States in general, are deeply interested. The expense, even including the canal, has been estimated, and doth not exceed the sum which would be requisite to complete a good road of fifty or sixty miles in some of the interior parts of the State, and which, after all, would only be of partial benefit, contributing but little to unite the remote parts of the same, in one easy central chain of communication with the capital.

The improvement of roads is, however, one great part of the design of our association, and we mean to make it our endeavor to bring forward and to encourage useful plans for this purpose. Some roads, as connected with the plan of inland navigation, require the immediate attention of the Legislature. Among these are the different portages mentioned in the respective water communications stated above; and, particularly, that between Stockport on Delaware, and Harmony, at the great bend of Susquehannah, and between the mouth of the Poplar run on Juniata, and the Canoe Place on Conemaugh. Another most important road, as connected with the navigation scheme, will be from the highest boatable waters of Yohiogeny, near the Turkey Foot, to the junction of the Raystown branch of Juniata and Dunning's creek near Bedford; or even to the mouth of Poplar run on the Frankstown branch. By this road all the inhabitants of the upper parts of Washington and Fayette counties, and part of Bedford county, would have access to the great water communication by the Juniata, or to the great State road from Bedford to Philadelphia; avoiding the mountainous and circuitous course they are now obliged to pursue; and a great part of their trade, which would otherwise go to Potomac, would be thereby secured to Pennsylvania.

In this view, also, the State road through Lancaster, Carlisle, and Bedford, to Pittsburg, is an object of primary consideration, and may be undertaken without delay or injury to the plan of Western navigation. This commonwealth, we are happy to believe, is now, in its resources, equal to the accomplishment of all necessary improvement, both of roads and navigation.

We would beg leave, before we conclude, to point out some other roads as worthy of attention, viz:

1. The road through Reading and Sunbury, and thence to be continued by the best and most practicable route to Presque Isle, or the lands on French creek.

2. The road through Bethlehem to the northern boundary of the State, at some point between Delaware and the great bend of Susquehannah.

3. A road leading from Hudson river, in the State of New York, to be continued from Stockport on Delaware, across towards the west branch of Susquehannah, between Munsey and the great island, and to join the road mentioned above, as leading to French creek and Presque Isle.

But, in every view, we humbly conceive, that the laying out and improving those roads ought not to interfere with, or delay the improvement of, our inland navigation. The ease and cheapness of water carriage, compared with every other, furnish sufficient arguments on the subject, if there were none else.

The annexed comparative view of the expenses of both is submitted to the consideration of the Legislature, as a conclusion to this memorial.

Signed on behalf and by order of the society.

ROBERT MORRIS, *President.*

FEBRUARY 7, 1791.

Remarks and calculations respecting the communications between Schuylkill and Susquehannah.

In the present year, 1790, by the best estimates that can be obtained, the quantity of one hundred and fifty thousand bushels of grain have been brought down the Susquehannah, and passed through Middletown, on its way to Philadelphia market. Juniata has afforded a very considerable part of this quantity; and here it must be observed that the lands on this river are but in an infant state of cultivation; and suppose them to be ever so well improved, the proportion they bear to the lands on the other branches of the Susquehannah is not more that one-fifth part.

In the year 1788, large quantities of wheat and flour were carried up the river for the use of the settlers in Northumberland county; since last March, about thirty thousand bushels of wheat returned down the stream to market from said county. It may also be reasonably expected, that should an easy inland communication be effected between the Susquehannah and the Schuylkill, the whole produce of Cumberland, and part of York county, would cross the Susquehannah to the Philadelphia market. From these principles it is evident, that there will be an annual increase of country produce that will descend the Susquehannah, although, from so short an experience, certainty in our estimates cannot be expected; but, in order to reduce the subject more to view, let the annual increase be put at one-eighth, which I expect will be allowed, on all hands, to be guided by moderation and justified by strong probability.

I said one hundred and fifty thousand bushels of grain are allowed to have passed to Middletown in the present year, which, augmented by an annual increase of one-eighth, will, in 1793, amount to two hundred and six thousand two hundred and sixty bushels, which, at two shillings and six pence per bushel, (the carriage, on the present principles, to the Philadelphia market,) amounts to twenty-five thousand seven hundred and eighty-one pounds, five shillings; then, by adding one-eighth, the annual increase, it will stand thus:—

For the year 1793,	£25,781 5 0
For the year 1794,	28,125 0 0
For the year 1795,	30,468 15 0
For the year 1796,	32,812 10 0
For the year 1797,	35,156 5 0
For the year 1798,	37,500 0 0
For the year 1799,	39,843 15 0
For the year 1800,	42,187 10 0
Whole amount of carriage to market,	£271,875 0 0

The abovementioned quantity of grain is equal to five thousand five hundred and twenty-four tons and a half; and suppose one-third of the weights carried back in salt, liquors, and other merchandise, at five shillings per hundred, or five pounds per ton, there will be one thousand eight hundred and forty-two tons, with an annual increase of one hundred and sixty-seven tons. It will then stand thus:—

For the year 1793,	£ 9,210 0 0
For the year 1794,	10,045 0 0
For the year 1795,	10,880 0 0
For the year 1796,	11,715 0 0
For the year 1797,	12,550 0 0
For the year 1798,	13,385 0 0
For the year 1799,	14,220 0 0
For the year 1800,	15,055 0 0
Whole amount of back carriage in eight years,	£97,060 0 0

The whole amount of carriage to and from Middletown in eight years:—

To Philadelphia,	£271,875
To Middletown,	97,060
	£368,935

Suppose the quantities before mentioned to be carried by water, the wheat at one shilling and six pence per bushel, and the back loads at three shillings per hundred, or three pounds per ton, it will then stand thus:—

To this market,	£15,468 15 0	For the year 1793,	From this market,	£5,426 0 0
	16,875 0 0	1794,		5,927 0 0
	18,281 5 0	1795,		6,428 0 0
	19,687 10 0	1796,		6,929 0 0
	21,093 15 0	1797,		7,430 0 0
	22,500 0 0	1798,		7,931 0 0
	23,906 5 0	1799,		8,432 0 0
	25,312 10 0	1800,		8,933 0 0
	£163,125 0 0			£57,436 0 0
	57,436 0 0			
	£220,561 0 0	Whole amount of carriage by water.		

Carriage by land in eight years,	£368,935
Carriage by water,	220,561
Balance,	£148,374

A number of observations naturally present themselves as consequences of this water communication: First, the difference between the carriage by land and that by water, during the aforesaid period, is one hundred and forty-eight thousand three hundred and seventy-four pounds, which will be a clear gain to the country; and the stock now vested in horses, wagons, &c., could be employed to other useful purposes. The so general use of horses might be abated and oxen used in their stead by the farmers, whose principal reason for giving so decided a preference to horses, is their being supposed better for draught on the roads: a more general use of oxen would not only be attended with immediate profit to the husbandman, but would tend to increase the article of beef as an export. The lands in the old counties, below the mountains, are known to have abated in that virgin fertility which attends all new cultivation; they must now be manured. Added to this, the population is increasing very rapidly. The operation of these causes, in a few years more, will make the consumption equal to the produce in the old counties. If the staple of the port of Philadelphia is to be supported, it can be best done by conducting the streams of commerce, in the article of grain, from the Susquehannah to this city.

The late information obtained from the commissioners who have viewed the communications with the Allegany and Lake Erie, make it highly probable, that an immense trade will, one day, be carried on from Philadelphia with the great lakes and fur countries, and with the settlements on the Ohio, &c. The proposed communication between Schuylkill and Susquehannah will serve as a basis to this traffic, whether the route be by the Juniata or the other branches of the Susquehannah.

The expense attending the transportation of two hundred and six thousand two hundred and fifty bushels of grain to market.

The above quantity of grain is equal to five thousand five hundred and twenty-four tons and a half; and a boat to carry six tons will be equal to nine hundred and twenty-one boat loads; and each boat to pass and repass eight times, annually, it will take one hundred and fifteen boats to transport the quantity above mentioned in a season.

The expense of hands and provisions attending each load will be £15; consequently, nine hundred and twenty-one loads will cost £13,815; and the annual increase of expenses, for an additional number of boats, hands, &c., to transport the increase of produce, will be £1,520 a year; and then it will stand thus:

For the year 1793,	£13,815 0 0
For the year 1794,	15,335 0 0
For the year 1795,	16,855 0 0
For the year 1796,	18,375 0 0
For the year 1797,	19,895 0 0
For the year 1798,	21,415 0 0
For the year 1799,	22,935 0 0
For the year 1800,	24,455 0 0
	£153,080 0 0

The whole expense of carriage, and for seventy-seven additional boats, some of which will be seven-eighths worn, and so on to one-eighth, allowing a boat to last eight years.

Amount of carriage by water in eight years,	£220,561
Expense attending the same,	153,080
Balance,	£ 67,481

It is supposed, by these calculations, that the boats, for the beginning of the carriage, will be taken in the estimate with the canal.

The grain consumed as horse feed will be another object of attention. Two hundred and six thousand two hundred and fifty bushels of grain, at forty-five to a wagon load, are equal to four thousand five hundred and eighty-three loads: each team, to be ten days on the road, will eat ten bushels of rye, which is equal to forty-five thousand eight hundred and thirty bushels, which, with the annual increase, will, in eight years, amount to four hundred and eighty-three thousand four hundred and eighty bushels; or, annually, it will stand thus:

	Bushels.
For 1793,	45,840
For 1794,	50,010
For 1795,	54,180
For 1796,	58,350
For 1797,	62,520
For 1798,	66,690
For 1799,	70,860
For 1800,	75,030
	483,840

Estimate of the expense of clearing the river Schuylkill, from the falls to Reading, by David Rittenhouse and others, in the year 1773.

Clearing the Schuylkill from the falls to the Spring Mill,	£192 0 0	
Ditto to Reading,	955 0 0	
		£1,147 0 0

Estimate of the expense of clearing the river Schuylkill, from the falls to Reading, by Benjamin Rittenhouse and John Adlum, in 1789.

Clearing the Schuylkill from the falls to the Spring Mill,	£270 0 0	
Ditto to Reading,	1,111 10 0	
Contingencies, £10 per cent.,	138 3 0	
		£1,519 13 0

Estimate of the expense of clearing the Tulpehocken creek, from its mouth to the head of the same, by Benjamin Rittenhouse and John Adlum.

Clearing the Tulpehocken from its mouth to Lechner's mill, twenty-eight miles and sixteen chains up said stream,	£1,289 10 0	
Contingent expenses, say 10 per cent,	129 19 0	
Amount of the estimate from Lechner's mill to the mouth of the creek,		1,419 9 0
A canal to be cut from Lechner's mill to Loy's spring, at the head of the Tulpehocken creek, about seven miles and a half in length, suppose twenty feet wide, and, on an average, seven feet deep, the expense of common cutting at nine pence per yard,	7,699 19 9	
For ten locks in the above distance,	2,000 0 0	
For temporary damages to lands, impediments to works, &c.. suppose 10 per cent. on the above,	970 0 0	
Amount of expense from Lechner's mill to the head of Tulpehocken creek,		10,669 19 9
For cutting the canal from Loy's spring, the head of Tulpehocken creek, to Kucher's dam, on the head of the Quittapahilla creek, four miles and sixty perches, on an average twenty-five feet deep and thirty feet wide, the expense of common cutting, nine pence per yard,		23,031 4 6
The amount of the expense for clearing the Schuylkill, Tulpehocken canal, &c., to the head of the Quittapahilla,		36,640 6 3

N. B. This expense may be avoided by leaving a portage of about four miles, which will reduce the whole to £32,540.

Amount of expense on Quittapahilla and Swatara to Susquehannah, by Matlack, Maclay, and Adlum, in 1790,	£18,900	0	0
Amount of expense from Philadelphia to Susquehannah, by way of Schuylkill and Swatara,	55,540	6	3
From the mouth of Swatara, up the Susquehannah, to the mouth of Juniata, by Galbreath, Boyd, and Huling,	300	0	0
Up Juniata to Water street on the Frank's town branch of Juniata,	820	0	0
Clearing the Frank's town branch to Frank's old town, by Matlack, Maclay, and Adlum,	1,500	0	0
Canal from thence to Poplar run,	7,000	0	0
Portage to Little Conemaugh, eighteen miles, at £20 per mile,	360	0	0
From the Canoe Place, on the Little Conemaugh, down the same, and Kiskeminetas to Allegany,	7,150	0	0
Opening French creek to Le Bœuf,	500	0	0
Road from Le Bœuf to Presque Isle,	400	0	0
Contingencies in Matlack's, Maclay's, and Adlum's estimate,	3,599	0	0
Amount of expense from Philadelphia to Presque Isle on Lake Erie, by way of Schuylkill, Swatara, Juniata, &c.,	£77,169	6	3

N. B. This may be reduced to £54,169, by leaving a portage of four miles between the Tulpehocken and Quittapahilla.

Estimate of the expense for opening the navigation and communications to Presque Isle, on Lake Erie, from Philadelphia by way of Schuylkill, Swatara, the west branch of Susquehannah, Sinnemahoning, Conewango, &c.

From Philadelphia to the mouth of Swatara, by Schuylkill, &c.,	£55,540	6	3
From Swatara to North town, at the forks of Susquehannah,	600	0	0
To the Canoe Place, on Sinnemahoning,	660	0	0
Portage to the Allegany,	460	0	0
From the head of the Allegany to the mouth of Chataughque creek, on Lake Erie,	1,400	0	0
Whole amount of expense to Presque Isle, as above,	£58,660	6	3

N. B. This estimate may be reduced to £35,660, by leaving the distance between Tulpehocken and Quittapahilla a portage.

Estimate of the expense of opening the river Delaware, from the falls, at Trenton, to Stockport, near the Popachton branch of the same, and the portage across to Harmony, on the great bend of the Susquehannah.

From the falls at Trenton to Easton,	£1,005	0	0
From thence to Stockport,	1,243	0	0
Portage to the great bend on the northeast branch of the Susquehannah,	400	0	0
Amount,	£2,648	0	0

A proposal and plan for carrying into immediate execution the improvement of roads and inland navigation.

To the Senate and House of Representatives of the Commonwealth of Pennsylvania, in General Assembly met:

The Society for promoting the Improvement of Roads and Inland Navigation beg leave to present the result of their inquiries concerning the best method and most effectual plan for the carrying that important work into immediate execution; and, in the first place, with respect to the improvement of roads, on turning our attention to the history of this work, as it hath been conducted in other countries, and especially in the island of Great Britain, we find that but little attention was paid to the improvement of roads till, in the year 1285, the first statute was passed for widening the roads between market towns "in England;" but this was done purely to prevent robberies, and not the least hint of its being yet necessary for the use of carriages or to promote commerce. But, in the year 1555, a statute was passed "taking notice that the highways were becoming very noisome, and tedious to travel, and dangerous to all passengers and carriages;" wherefore, it was enacted, "that every parish should annually choose two surveyors of the highways to see that the parishioners, according to their lands, abilities, and farms, shall send their carts, horses, men, tools, &c. four days in every year, for mending the roads, &c.; and, from this time to the reign of Charles II., there were no less than twenty-six statutes, on similar principles, passed for keeping the highways in repair, from which the road laws of Pennsylvania have been in a great measure copied, only substituting townships for parishes. But, soon after the restoration of Charles II., we find it set forth—"that the vast increase of the capital city of London, and of the nation's commerce and manufactures, with the concomitant increase of wealth and luxury, had introduced such numbers of heavy wheel carriages on the roads, as rendered it impracticable, in most cases, for parishes to keep their own part of the roads in repair, more especially in the counties lying nearer London, and in the manufacturing counties; and, therefore, a more equitable and effectual method was introduced of tolls and toll-gates, called turnpikes, by which means the burden of putting and keeping the roads in repair (as it is strongly expressed) was put upon the identical wearers-out of the roads, according to the use they made of them; and, accordingly, upon this new and more equitable and effectual plan, many local, as well as general statutes have been enacted, for limiting the weight of wagon-loads, the breadth of wheel-rims, called fellies, the number of horses, &c. And what has been said of roads may be applied to the deepening of rivers, and the improvement of inland navigation, by locks, tolls, and canals," which was begun about the same time, and is now extended over the whole kingdom by subsequent acts of Parliament special and local as well as more general.

The present circumstances of Pennsylvania, in respect to the increase of commerce, wheel-carriages, &c. and the unimproved state of our roads and inland navigable waters, being so similar to those of England in the time of Charles II., the foregoing reasoning will justify the conclusion which we mean to draw from it, namely: that the putting or keeping the great roads in repair, either in the counties near the capital city of Philadelphia, or, indeed, in dis-

tant counties but thinly inhabited, would be a burden not only intolerable to the inhabitants of the particular townships through which the roads pass, but likewise unequal in itself, and ought neither to be borne by the State at large, nor yet by the particular townships and counties; but, for the greater part, "by the *identical wearers-out* of the roads, according to the use they make of them." And the like reasoning applies to the improvement of rivers and opening of canals for water carriage.

From these preliminary observations, the Society beg leave to lay down the following principle, as the groundwork of the plan herewith submitted to the consideration of the Legislature of Pennsylvania:

First. The method of turnpike roads and toll navigation must be adopted.

Secondly. The work, both of roads and navigation, must be undertaken and carried into execution by separate companies and associations of men, upon some uniform and consistent plan, aided and directed by the Legislature; as neither the State alone, nor any number of companies, without public regulations and assistance, can be adequate to the great work in all its parts; and, therefore, the assistance of the State should be apportioned to different parts of the work with a liberal and equal hand in respect both to roads and navigation as it may be most necessary, and where the smallness of the tolls, the distance from the market and other circumstances may yield the least probability of an adequate encouragement or speedy reimbursement to the adventurers.

Upon those principles, the society beg leave to offer the following

Heads of a plan:

I. The Legislature to appropriate a sum not less than ——— dollars to this object.

II. In order that there may be sufficient wisdom, consistency, experience, impartiality, and public spirit attached to the execution of the work, and interested in its success. The Legislature to appoint by law a "board of commissioners for the improvement of roads and inland navigation within the State of Pennsylvania."

III. The board to consist of ——— members, of which the Governor shall be president, with a vice president, to be annually elected. They shall meet once a week, or as often as may be needful. The time and place of every meeting to be announced in one of the daily newspapers, and the members present, being not less than ———, to be capable of transacting business.

IV. The board of commissioners to be allowed the use of a room or rooms in some of the public buildings in the city of Philadelphia, wherein they may hold their meetings, and deposite their books, maps, plans, and other papers. They are to be allowed firing, candles, stationary, clerks' hire, and actual contingent necessary expenses to be paid by the public; but they shall not receive any pay for their own time or personal services, unless when any of them shall be employed by the board to make surveys, or to inspect or superintend any of the works that may be carried on under their direction; in which cases they shall be entitled to their travelling charges and expenses.

V. The general and standing powers of the said board of commissioners shall be as follows, viz:

1. To employ at the public expense a proper person or persons to examine, survey, mark out, and report in writing such roads as may be deemed the most proper to be established as turnpikes, assigning their reasons that induced them to be of opinion in any instance that it will be of public utility to depart from the present or old line of any established road.

2. To determine finally (after considering such reports and obtaining all necessary information) upon the line of road which shall be established as turnpike.

3. To determine on such roads as not being suitable for turnpike, ought to be made or repaired at public cost, and to employ proper persons to perform the same.

4. To advertise the roads which they shall establish for turnpikes; receive propositions and enter into contracts with individuals, companies, or corporations, for constructing and mending the said roads in such manner and upon such principles as have in other countries been found upon experience to be best.

5. To fix in each contract the particular road and the extent and length thereof which the parties are to improve, and the rates or tolls which they shall be entitled to receive for horses, cattle, carriages, &c.

6. To appoint a superintendent, if desired by the contractors, who shall attend and survey the work, and see that it be well executed, and at as moderate an expense as may be practicable: he shall likewise examine and certify every account, so as to ascertain truly the actual amount necessarily expended.

7. To engage with such contractors as shall submit their operations to the control of a superintendent.

First. That if the tolls fixed should, upon experience, be found so unproductive as not to yield, after paying annual charges, six per centum per annum, clear upon the capital expended, the board of commissioners shall in such case pay the annual deficiency; or may annul such contract on repaying to the contractors the money expended.

Secondly. That, on the contrary, where the toll shall be found so productive as to yield more than six per cent. per annum, the commissioners may, at the end of ——— years, annul such contract, paying back the capital sum with an advance of ——— per cent. to the proprietors. But if the contractors do not agree to a public superintendent or ask aid, it may be supposed that the contract is amongst the advantageous ones, and the commissioners may, at the end of ——— years, annul the same as above.

8. To authorize the contracting parties to establish fences and gates at such distances as may be deemed necessary and proper to enable the due collection of the tolls with the least possible inconvenience to travellers.

9. The several boards of contractors shall be declared by law to be corporations or bodies politic, for carrying into effect the purposes of their contracts for and during the terms thereof; and shall be authorized

First. To divide the capital sum expended into shares of ——— dollars each; and

Secondly. To grant a certificate to every proprietor of a share, which shall be transferable at pleasure, and every holder of a share, whilst he continues so to be, shall be a member of the corporation.

Thirdly. Each corporation shall have a right to elect a treasurer and managers to conduct the affairs of the corporation agreeably to such rules and regulations as it may from time to time establish.

Fourthly. Every share to entitle the holder to a vote in establishing general rules and regulations, and in the choice of the treasurer and managers.

Fifthly. The managers to have power—

1st. To call upon the contractors or subscribers for such proportions, from time to time, of their respective subscriptions, as may be necessary to carry on the work until finished, placing the sums collected in the hands of the treasurer.

2d. To employ workmen, purchase materials, and conduct the whole business, either under their own inspection, or by their agent or agents.

3d. To settle all accounts, and draw orders upon the treasurer for the payments or advances which ought to be made.

4th. To superintend the collection of the tolls, either by proper agents to be employed for the purpose, or by farming the same to individuals.

5th. To settle the accounts of the tolls and make dividends half-yearly, which shall be announced in the newspapers.

6th. To call the corporation together whenever they shall find it necessary, and to lay their proceedings and accounts before it, at least once a year, and oftener, if thereunto required by a quorum thereof.

10. The said board of commissioners to have the care and superintendence of inland navigations, respecting which they should be empowered—

First. To determine which of those that are proposed by the report of the committee of Assembly shall be undertaken solely at the public expense, and which of them can best be performed by contractors entitled to tolls, &c. The latter to be preferred whenever the situation and nature of the improvements will admit of it. With respect to the former, the Board should be authorized to carry on the work at the public expense, under the direction of such agent or agents as they may appoint for that purpose. In regard to the latter, viz: such improvements as may be entitled to tolls, the Board should be empowered:

1st. To advertise for contracts.

2d. To appoint superintendents to examine, survey, and report the works necessary to be performed.

3d. To make the contracts and engagements with individuals, or companies, willing to undertake the same, and who are to be declared bodies politic, as proposed in the case of roads.

4th. The commissioners shall also have power to fix the tolls, and to divide the capital into shares transferable, &c., as in the case of turnpike roads.

11. By an article in each contract, the Government shall be restrained from laying out or establishing turnpikes, or toll navigations, in a second instance, that, during ——— years, would destroy or diminish the income or revenue of turnpikes or toll navigations which they had established in the first instance.

12. The board of commissioners to be empowered to lend public money, if necessary, to any contractors or subscribers, to turnpike roads, or toll navigations, for the purpose of completing what they have undertaken, if, after going certain lengths, it should appear that they would be unable to complete the same without such aid, sufficient security being given, that the sums so lent shall be faithfully applied to the uses intended, and repaid at the end of the term stipulated. Or, the said board may subscribe, on behalf of the Commonwealth, such number of shares, under any contract for turnpike roads or toll navigations, as may be found necessary, and be entitled to all the rights and privileges conferred on the shareholders.

13. The board of commissioners shall make application to the Governor, for his warrant upon the treasurer, for the sums of money which they may, from time to time, require, for carrying their duty into effect; their requisitions to be made in writing, and to be founded upon estimates of expenditures necessary, or actually made, or upon engagements, subscriptions, or contracts, made for the purposes of their appointment, and the Governor to grant his warrants upon such requisition, (to be paid out of the fund appropriated to this use,) unless he shall see sufficient cause to refuse; in which case he shall assign his reasons in writing.

The society have directed an accurate geographical and hydrographical map to be compiled from actual surveys; exhibiting a general and complete view of the roads and water communications, which are proposed to be improved, connecting them with the roads and water communications of the neighboring States; and they have promoted a liberal subscription for the immediate publication of the same; considering that such a map will not only be highly useful to all persons who wish to gain a general knowledge of the situation of the country, and the various improvements of which the State of Pennsylvania is susceptible, but it will likewise be useful to the public, by directing their attention to the different parts of the State which are the objects of improvement, and bringing forward individuals, as well as companies, to promote and undertake the execution of the same. But as the subscriptions of the members of the society alone may not be sufficient encouragement for the publication of a map of such an expensive nature, the society beg leave to recommend the further encouragement of the same to the Legislature, and herewith have presented the original draught of the same to their inspection.

All which is humbly submitted.

By order, and on behalf, of the society,

ROBERT MORRIS, *President.*

The foregoing memorial, with the estimates and proposed plan of execution, having been referred by the Legislature to committees of their respective houses, to confer with the committee of the society of roads and navigation, and to report thereon; the result of the whole, after mature deliberation, was the adoption of the following general principles:

That the Legislature, although animated with the warmest zeal for the improvement of their country, by means of roads and inland navigation, yet could not subject the finances of the State (even if adequate) to the burden of the whole; but they would make liberal appropriations of public money for the improvement of such roads and navigable waters, as lying too remote from the more populous parts of the country, and the inhabitants but thinly settled, rendered it impracticable for them either to improve their own roads and waters by subscriptions or the usual county taxes; and the profits of the tolls would yet be too small to induce companies to undertake the work at their own expense; and that in the more settled parts of the country, especially near the metropolis, they would be ready to incorporate companies, for the gradual and progressive improvement of roads and waters, where the tolls would be sufficient to recompense the subscribers or stockholders, and the charge would fall, according to justice, upon those who were to be benefited, in proportion to the use they might make of such roads and waters.

The Legislature, therefore, in discharge of their part, and to set a laudable example of public spirit, made large appropriations, by law, for the improvement of sundry roads and waters. [See the appendix following.] They also passed the following acts of incorporation, viz:

AN ACT to enable the Governor of this Commonwealth to incorporate a Company for opening a Canal and Lock Navigation between the rivers Schuylkill and Susquehannah, by the waters of Tulpehocken, Quittapahilla, and Swatara, in the counties of Berks and Dauphin.

Whereas the opening a communication, by water, for the transportation of the produce of the country, and of goods, wares, and merchandises, between the city of Philadelphia and the western and northwestern counties of the State of Pennsylvania, will greatly tend to strengthen the bands of union between citizens inhabiting distant parts of a country governed by the same free and happy constitution and laws, to the encouragement of agriculture and manufactures, and the promotion of commerce: And whereas, from reports, made by certain commissioners, appointed by the late supreme executive council, in pursuance of an act of the General Assembly of this Commonwealth, in such case provided, it appears that the waters of the Tulpehocken, Quittapahilla, and Swatara, in the counties of Berks and Dauphin, united by means of a canal and locks, will be sufficient for an inland navigation for the purposes aforesaid; and it is reasonable that the expense of procuring so great a convenience should be defrayed by the persons who will derive an immediate benefit by the use of it:

Sec. 1. *Be it therefore enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania, in General Assembly met, and it is hereby enacted by the authority of the same,* That Henry Drinker, Robert Hare, Joseph Heister, George Latimer, George Fry, William Montgomery, and Samuel Miles, be, and they are hereby, appointed commissioners, to do and perform the several duties hereinafter mentioned, that is to say: They shall, and may, on or before the 1st day of December next, procure a book, and therein enter as follows:— "We, whose names are hereto subscribed, do promise to pay to the president, managers, and company of the Schuylkill and Susquehannah Navigation, the sum of $400 for every share of stock in the said company set opposite to our respective names, in such manner and proportions, and at such times, as shall be determined by the said president and managers, in pursuance of an act of the General Assembly of Pennsylvania, entitled 'An act to enable the Governor of this Commonwealth to incorporate a company for opening a canal and lock navigation between the rivers Schuylkill and Susquehannah, by the waters of Tulpehocken, Quittapahilla, and Swatara, in the counties of Berks and Dauphin;'" and shall, thereupon, give notice in three of the public newspapers printed in Philadelphia, one whereof shall be in the German language, for one calendar month, at least, of the time and place, when and where, the said book will be opened to receive subscriptions of stock for the said company, at which time and place the said commissioners, or any three of them, shall attend, and shall permit and suffer all persons who shall offer to subscribe in the said book, which shall be kept open for at least fifteen days, for any number of shares of the said stock, not exceeding ten, by or for any one person or copartnership, at one time; and, if need be, shall adjourn, from time to time, as the said commissioners shall find proper and necessary, until the number of subscriptions shall amount to 1,000 shares of stock; and if, while the said subscription shall be open, a greater number of shares shall be applied for, than will fill up the said number of shares, then the said commissioners shall apportion the whole number of shares previously applied for, by lottery, to and among the persons who shall have subscribed, or offered to subscribe, before the said commissioners shall have declared the subscription to be full, and the book closed; and when the said subscription shall be filled to the amount of 500 shares, the said commissioners shall return to the Governor of this Commonwealth a full and perfect list of all the subscriptions to the said stock, with the number of shares by them respectively subscribed, certified under the hands and seals of the said commissioners.

Sec. 2. *And be it further enacted by the authority aforesaid,* That whenever 500 shares shall be subscribed to the capital stock of the company, that then it shall and may be lawful to and for the Governor of this Commonwealth, by letters patent, under the great seal of the State, to create and erect the said subscribers into one body corporate and politic, in deed, and in law, with perpetual succession, and with all the privileges and franchises incident to a corporation, by the name, style, and title of "The President, Managers, and Company of the Schuylkill and Susquehannah Navigation;" and by such name the said subscribers shall be able and capable, by force of this act and the said letters patent, of exercising all and singular the said privileges and franchises; and, moreover, shall be able and capable of holding their said capital stock, and the increase and profits thereof, and of enlarging the same, from time to time, by new subscriptions, in such manner and form as they shall think proper, if such enlargement shall be found necessary to fulfil the end and intent of this act; and of purchasing, taking, and holding to them, their successors and assigns, in fee simple, or for any lesser estate, all such lands, tenements, and hereditaments, as shall be necessary for them in the prosecution of their works; and of doing all and every other act, matter, and thing, which a corporation or body politic may lawfully do.

Sec. 3. *And be it further enacted by the authority aforesaid,* That the first seven persons named in the said letters patent shall, as soon as conveniently may be, after sealing the same, give notice, in three of the newspapers published in the city of Philadelphia, as aforesaid, of a time and place by them appointed, not less than thirty days from the time of issuing the said notice, at which time and place the said subscribers shall proceed to organise the said corporation, and shall choose, by majority of votes of the said subscribers, by ballots, to be delivered in person, or by proxy, one president, twelve managers, one treasurer, and such other officers as they shall think necessary to conduct the business of the said company, for one year, and until other officers shall be elected; and shall or may make such by-laws, rules, orders, and regulations, not inconsistent with the constitution and laws of this Commonwealth, as shall be necessary for the well-ordering the affairs of the said company: *Provided always,* That no person shall have more than twenty votes in the said elections, or in determining any question arising at such meeting, whatever number of shares he may be entitled unto, and that each person holding one or more shares, under the said number of twenty, shall have one vote for every share by him held.

Sec. 4. *And be it further enacted by the authority aforesaid,* That the said company shall meet on the first Monday in January in each succeeding year, at such place within this State as shall be fixed by the rules and orders of the said company, to be made as aforesaid, for the purpose of choosing such officers as aforesaid for the ensuing year, and at such other time as they shall be assembled by the managers for the purpose of making such further by-laws, rules, orders, and regulations, not inconsistent with the constitution and existing laws of this State, as shall, from time to time, be necessary, of which meetings previous notice shall be given; in such manner as shall be provided by such rules and orders.

Sec. 5. *And be it further enacted by the authority aforesaid,* That the said president and managers shall procure certificates to be written or printed, for every share of the capital stock of the said company, and deliver one to each subscriber, signed by the president and sealed with their common seal, he paying to the treasurer of the company the sum of seventy-five dollars for every share by him subscribed, which certificate shall be transferable at his pleasure, in the presence of the treasurer of the said company, subject, however, to all payments thereupon due and to grow due; and the holder of every such certificate, having first caused the assignment to him to be entered into a book of the company, to be kept for that purpose, shall be a member of the said corporation, entitled to one share of the capital stock, and of all the estate and emoluments of the company, and to vote as aforesaid at the general meetings thereof.

Sec. 6. *And be it further enacted by the authority aforesaid,* That the said president and managers shall have full power and authority to appoint all officers necessary to supply vacancies by death, resignation, or otherwise, and also to appoint one or more superintendent of the works to be undertaken by them, and to hire and employ all such engineers, artists, workmen, and laborers, as they shall find necessary to carry on the same; and by the said superintendent, engineers, artists, workmen, and laborers, to enter into and upon all and singular the land and lands covered with the water situate upon, near, and between Tulpehocken creek, in the county of Berks, and Swatara creek, in the county of Dauphin, and to lay out and survey such route or tracks as shall be most practicable for effecting a navigable canal between the rivers Schuylkill and Susquehannah, by means of locks and other devices; doing, nevertheless, as little damage as possible to the grounds and enclosures in and over which they shall pass; and thereupon it shall and may be lawful to and for the said president and managers to contract and agree with the owners of any lands and tenements, for the purchase of so much thereof as shall be necessary for the purpose of making, digging, and perfecting the said canal, and of erecting and establishing all the necessary locks, works, and devices, to such a navigation belonging, if they can agree with such owners; but in case of disagree-

ment, or in case the owner thereof shall be *feme coverte*, under age, *non compos mentis*, or out of the State, then it shall and may be lawful to and for the said president and managers to apply to two of the justices of the supreme court of this commonwealth, who, upon such application, are hereby authorized and empowered, enjoined, and required, to frame and issue one or more writ or writs, as occasion shall require, in the nature of a writ of *ad quod damnum*, to be directed to the sheriff of the county in which such lands and tenements shall be, commanding him, that by the oaths and affirmations of twelve good and lawful men of his bailiwick, who shall be indifferent to the parties, he shall inquire whether the person or persons owning any lands and tenements, necessary to be used by the said president and managers, or which shall be injured in establishing the said canal and navigation, which person or persons shall be named, and which lands and tenements shall be described in such writ or writs, will suffer and sustain any, and what damages, by reason or means of taking any lands, tenements, mill, mill-pond, water, water course, or other real hereditament, necessary for the use of the said canal and navigation, and the locks and works thereto belonging, and to return the same writ, together with the finding of the said jury, to the next supreme court of this commonwealth after such finding; and, upon such writ being delivered to the said sheriff, he shall give at least ten days' notice, in writing, to all and every the owners of the lands and tenements in the said writ described, of the time of executing the same, and shall cause to come upon the premises, at the time appointed, twelve good and lawful men of his bailiwick, who shall be selected in such manner as struck juries usually are, to whom he shall administer an oath or affirmation, that they will diligently inquire concerning the matters and things in the said writ specified, and a true verdict give, according to the best of their skill and judgment, without favor or partiality; and thereupon the said sheriff and inquest shall proceed to view all and every the lands and tenements in such writ specified; and, having considered the quantity of land, land covered with water, mills, buildings, or other improvements, that shall be necessary to be vested in the said company for the purposes aforesaid, and any water course then existing, the use whereof will be necessary for the purpose aforesaid, they shall cause the same to be minutely and exactly described by metes and bounds, or other particular descriptions, and shall value and appraise the injury or damages, if any, which the owner or owners of the said lands, tenements, mills, waters, water courses, buildings, or improvements will, according to their best skill and judgment, sustain and suffer, by means of so much of the said lands and tenements being vested in the said company; or by means of such improvements being destroyed, or rendered useless or of less value, or by means of the said company being permitted to turn such water to fill their canal and locks, or by means of the said company being permitted to enlarge any mill-pond, mill-race, or other water-course, and to use the same as and for part of their said canal and navigation, or by any other means whatsoever, defining and ascertaining, as well all such lands and tenements, liberties and privileges, so to be vested in the said company, as the several sums at which the said injuries and damages shall be so assessed; and the said sheriff and jury shall make an inquisition under their hands and seals, distinctly and plainly setting forth all the matters and things aforesaid; and the sheriff shall forthwith return the same, together with the said writ, to the office of the prothonotary of the supreme court; and at the first supreme sourt which shall be held next after the return of any such writ, the justices of the said court shall examine the same, and if the said writ shall appear to have been duly executed, and the return thereof be sufficiently certain to ascertain the lands and tenements, rights, liberties, and privileges, intended to be vested in the said company, and the several compensations awarded to the owners thereof, then the said court shall enter judgment, that the said company, paying to the several owners as aforesaid the several sums of money in the said inquisition assessed, or bringing the same into the said court, over and beside the costs of such writ, and of executing and returning the same, shall be entitled to have and to hold to them, and their successors and assigns forever, all and every the lands, tenements, rights, liberties, and privileges, in the said inquisition described, as fully and effectually as if the same had been granted to them by the respective owners thereof; and if any return so to be made shall not be sufficiently certain for the purposes aforesaid, the said court shall award an inquisition *de novo*.

SEC. 7. *And be it further enacted by the authority aforesaid*, That wherever the said canal shall cross any public or private laid out road or highway, or shall divide the grounds of any person into two parts, so as to require a ford or bridge to cross the same, the jury who shall inquire of the damages to be sustained, in manner herein directed, shall find and ascertain whether a passage across the same shall be admitted and maintained by a ford or by a bridge; and, on such finding, the said president, managers, and company, shall cause a ford to be rendered practicable, or a bridge, fit for the passage of carts and wagons, to be built and for ever hereafter maintained and kept in repair, at all and every the places so ascertained by the said jury, at the costs and charges of the said company; but nothing herein contained shall prevent any person from erecting and keeping in repair any foot or other bridge across the said canal, at his own expense, where the same shall pass through his ground, provided the same shall be of such height above the water as shall be usual in the bridges erected by the company; and provided, also, that such foot or other bridges, so to be erected by the owners of such land, shall not interfere with any of the locks, buildings, or other works of the company.

SEC. 8. *And be it further enacted by the authority aforesaid*, That the said president and managers shall have power and authority, from time to time, to fix the several sums of money which shall be paid by the subscriber or holder of every share of the stock of the said company, in part of the sum subscribed, and the time when each and every dividend or part thereof shall be paid, and the place where it shall be received, and shall give at least thirty days' notice, in three of the public newspapers published in the city of Philadelphia, as aforesaid, of the sum or dividend, and the time and place of receiving the same; and if any holder of any share shall neglect to pay such proportions, at the place aforesaid, for the space of sixty days after the time so appointed for paying the same, every such shareholder or his assignee shall, in addition to the dividend so called for, pay after the rate of five per cent. for every month's delay of such payment; and if the same, and the said additional penalty, shall not be paid for such space of time as that the accumulated penalties shall become equal to the sums before paid for and on account of such shares, the same shall be forfeited to the said company, and may and shall be sold by them to any person or persons willing to purchase, for such prices as can be obtained therefor.

SEC. 9. *And be it further enacted by the authority aforesaid*, That it shall and may be lawful to and for the said president and managers, and their superintendents, engineers, artists, workmen, and laborers, with carts, wagons, wains, and other carriages, with their beasts of draught and burden, and all necessary tools and implements, to enter upon the lands contiguous or near to the said track of the intended canal and navigation, first giving notice of their intention to the owners thereof, and doing as little damage thereto as possible, and repairing any breaches they may make in the enclosures thereof, and making amends for any damages that may be sustained by the owners of such ground, by appraisement, in manner hereinafter directed, and upon a reasonable agreement with the owners, if they can agree, or, if they cannot agree, then upon an appraisement to be made upon the oath or affirmation of three, or, if they disagree, any two indifferent freeholders, to be mutually chosen, or, if the owners neglect or refuse to join in the choice, to be appointed by any justice of the peace of the county, and tender of the appraised value; to carry away any stone, gravel, sand, or earth, being most conveniently situate for making or repairing the said canal and navigation, and to use the same in carrying on the said works.

Sec. 10. *And be it further enacted by the authority aforesaid*, That it shall and may be lawful to and for the said president and managers of the said company, so soon as the said canal and navigation, or any part thereof, shall be perfected, to appoint such and so many collectors of tolls for the passage of boats and vessels in, through, and along the same, and in such places as they shall think proper; and that it shall and may be lawful to and for such toll collectors and their deputies to demand and receive of and from the persons having the charge of all boats and vessels, and rafts of timber, boards, plank, or scantling, passing through the said canal and navigation, and the locks thereto belonging, such tolls and rates for every ton weight of the ascertained burden of the said boats and vessels, and for every hundred feet, cubic measure, of timber, and twelve hundred feet, board measure, of boards, plank, or scantling, in rafts, as the said president and managers shall think proper, at any lock or other convenient place; provided that the amount of all the tolls, from the mouth of the Swatara to the mouth of the Tulpehocken, shall not exceed, in the whole, the sum of one dollar for every ton of the burden of such boat or vessel, and for every hundred feet, cubic measure, of timber, and twelve hundred feet, board measure, of boards, plank, or scantling, and so in proportion for any smaller distance and lesser number of locks, in any interval between the mouths of the said creeks.

And in order to ascertain the tonnage of boats using the said canal navigation, and to prevent disputes between the supercargoes and collectors of tolls concerning the same—

Sec. 11. *Be it further enacted by the authority aforesaid*, That, upon the request of the owner, skipper, or supercargo of such boat or raft, or of the collector of the said tolls at any lock upon the said canal and navigation, it shall and may be lawful for each of them to choose one skilful person to measure and ascertain the number of tons which the said boat or vessel is capable of carrying, and to mark the same in figures upon the head and stern of the said boat, in colors mixed with oil; and that the said boat or vessel, so measured and marked, shall always be permitted to pass through the said canal and locks, for the price per ton to which the number of tons so marked on her shall amount unto, agreeably to the rates fixed in the manner aforesaid; and if the owner, skipper, or supercargo of such boat or vessel shall decline choosing a person resident within four miles of the place where such toll is payable, to ascertain the tonnage thereof, then the amount of such tonnage shall be fixed and ascertained by the person appointed for that purpose by the said president and managers, or chosen by the said collector of tolls for the said company, and the toll shall be paid, according to such measurement, before any such boat or vessel shall be permitted to pass the lock or place where such toll shall be made payable by the said company.

Sec. 12. *And be it further enacted by the authority aforesaid*, That if any person or persons whatsoever shall wilfully and knowingly do any act or thing whatsoever, whereby the said navigation, or any lock, gate, engine, machine, or device thereto belonging, shall be injured or damaged, he or they so offending, shall forfeit and pay to the said company fourfold the costs and damages by them sustained by means of such known and wilful act, together with costs of suit in that behalf expended, to be recovered by action of debt in any court having jurisdiction competent to the sum due.

Sec. 13. *And be it further enacted by the authority aforesaid*, That the collectors of tolls, duly appointed and authorized by the said president and managers, may stop and detain all boats and vessels using the said canal and navigation until the owner, skipper, or supercargo of the same shall pay the tolls so as aforesaid fixed, or may distrain part of the cargo therein contained, sufficient, by the appraisement of two credible persons, to satisfy the same, which distress shall be kept by the collector of the tolls taking the same, for the space of five days, and afterwards be sold by public auction, at the most public place in the neighborhood, to the highest bidder, in the same manner and form as goods distrained for rent are by law sold and saleable, rendering the surplus, if any there be, after payment of the said tolls and the costs of distress and sale, to the owner or owners thereof.

Sec. 14. *And be it further enacted by the authority aforesaid*, That the president and managers of the said company may demand and require of and from the said treasurer, and of and from all and every other the superintendents, officers, and other persons by them employed, bonds, in sufficient penalties, and with such sureties as they shall, by their rules, orders and regulations, require for the faithful discharge of the several duties and trusts to them, or any or either of them, respectively committed.

Sec. 15. *And be it further enacted by the authority aforesaid*, That the president and managers of the said company shall keep fair and just accounts of all moneys received by them from the subscribers to the said undertaking, for their subscriptions thereto, and all penalties for delay or non-payment thereof, and of all moneys by them expended in the payment of the costs and charges of procuring and purchasing all estates, rights and titles, in the said company, to be vested in pursuance of this act, or by any other means, and in paying their several officers by them to be appointed, and the wages of the different engineers, artists, workmen and laborers by them to be employed, and for the materials and work furnished and done in the prosecution of the works projected by the said company, and shall, once at least in every year, submit such account to the general meeting of the stockholders, until the said canal and creeks, therewith connected, shall be rendered navigable, and until all the costs, charges, and expenses of effecting the same shall be fully paid and discharged, and the aggregate amount of such expenses shall be liquidated; and from and after the liquidation thereof, if the one thousand shares above mentioned shall not be sufficient, it shall and may be lawful to and for the said president, managers and company, at a general meeting of the stockholders thereof, held in pursuance of the preceding provisions, or called by the president and managers of the company for the especial purpose, by public notice in three newspapers in manner aforesaid, (which shall be given three months previous to the opening of the said subscriptions,) to increase the number of shares to such extent as shall be deemed sufficient to accomplish the object of this act, and to demand and receive such additional subscriptions from the former, or, in case of their neglect or refusal from new subscribers, and upon such terms, and in such manner, as, by the said general meeting shall be agreed upon; and the said president and managers shall also keep a just and true account of all and every of the moneys received by their several and respective collectors of tolls in and through the said canal and navigation, from one end thereof to the other, and shall make and declare a dividend of the clear profits and income thereof (all contingent costs and charges being first deducted) among all the subscribers to the said company's stock; and shall, on every the second Mondays of January and July, in every year, publish the half yearly dividend to be made of the said clear profits to and amongst the stockholders, and of the time and place when and where the same shall be paid, and shall cause the same to be paid accordingly.

Sec. 16. *And be it enacted by the authority aforesaid*, That the said president and managers shall, at the expiration of every third year from the date of their incorporation, lay before the General Assembly of this commonwealth an abstract of their accounts, showing the whole amount of the capital expended in purchasing real estates, and in digging, erecting, and establishing the whole of the said canal, locks and works, and the whole income and profits arising from the said tolls for and during the said periods, together with the exact amount of the contingent charges of supporting, maintaining, and keeping the same in repair for the said periods, to the end that the clear annual profits may be known; and if, at the end of two years after the said canal navigation shall be completed, it

shall appear that the said clear profits and income will not bear a dividend of six per centum per annum on the whole capital stock of the said company, so expended, then it shall and may be lawful to and for the said president, managers, and company to increase the tolls herein above allowed to them, so much per ton through the whole length of the canal and navigation, and in proportion for each separate part thereof, as will raise the dividends up to six per centum per annum; and at the end of every period of ten years after the said canal shall be completed, they shall render a like abstract to the General Assembly of their accounts for three preceding years; and if, at the end of any such decimal period it shall appear, from such abstract, that the clear profits and income of the said company will bear a dividend of more than twenty-five per centum per annum, then, and in such case, the said tolls shall be reduced so much per ton, as will reduce the said clear profits and income to a dividend not exceeding twenty-five per centum per annum.

Sec. 17. *And be it further enacted by the authority aforesaid*, That whenever the profits of the said society shall amount to a clear annual dividend of fifteen per centum on the whole amount of their capital, there shall then be reserved one per centum out of the same, which shall be applied, at the direction of the Legislature, for the establishment of schools, and the encouragement of the arts and sciences, in one or more seminaries of learning, according to the provisions of the constitution.

Sec. 18. *And be it further enacted by the authority aforesaid*, That if the said company shall not proceed to carry on said work within the space of two years from the passing of this act, or shall not, within the space of ten years from the passing of this act, complete the same canal and navigation, so as to open an easy and safe water communication from the mouth of Swatara to the mouth of Tulpehocken, navigable for boats of at least seven tons burden, then, and in either of those cases, it shall and may be lawful for the Legislature of this commonwealth to resume all and singular the rights, liberties, and privileges, hereby granted to said company.

WILLIAM BINGHAM,
Speaker of the House of Representatives.

RICHARD PETERS,
Speaker of the Senate.

Approved, September 29, 1791.

THOMAS MIFFLIN,
Governor of the Commonwealth of Pennsylvania.

AN ACT to enable the Governor of this commonwealth to incorporate a company for opening a canal and water communication between the rivers Delaware and Schuylkill, and for other purposes therein mentioned.

Whereas, connecting the waters of the rivers Delaware and Schuylkill by means of a canal, will not only immediately contribute to the convenience of the citizens, but correspond with the extensive plan of connecting the eastern with the western waters of the State, and there being ample reasons for expecting that the same may be effected by individual citizens, if invited thereto by reasonable encouragement: Therefore,

Section 1. *Be it enacted by the Senate and House of Representatives of the commonwealth of Pennsylvania in General Assembly met, and it is hereby enacted by the authority of the same*, That David Rittenhouse, William Moore Smith, Elliston Perot, Cadwallader Evans, Jun., and Francis Johnston be, and they are hereby, appointed commissioners to do and perform the several duties hereafter mentioned; that is to say, they shall and may, on or before the first day of July next, procure a book or books, and therein enter, as follows: "We, whose names are hereunto subscribed, do promise to pay to the president and managers of the Delaware and Schuylkill canal navigation the sum of two hundred dollars for every share of stock in the said company set opposite to our respective names, in such manner and proportions, and at such times, as shall be determined by the said president and managers, in pursuance of an act of the General Assembly of this commonwealth, entitled 'An act to enable the Governor of this commonwealth to incorporate a company for opening a canal and water communication between the rivers Delaware and Schuylkill;'" and shall thereupon give notice in three of the public newspapers printed in Philadelphia, one whereof shall be in the German language, for one calendar month at the least, of the time and place when and where the said book or books will be opened to receive subscriptions of stock for the said company; at which time and place the said commissioners, or any three of them, shall attend, and shall permit and suffer all persons who shall offer to subscribe in the said book or books, which shall for that purpose be kept open at least six hours in every juridical day, for the space of at least three successive days; and on any of the said juridical days, within the hours aforesaid, any person of the age of twenty-one years shall have liberty to subscribe, in his own or any other name or names, by whom he shall be authorized, for one share; on the second day, for one or two shares; on the third, for one, two, or three shares; and on any succeeding day, while the said books shall remain open, for any number of shares in the said stock; and if, at the expiration of the said three first days, the said book shall not have two thousand shares therein subscribed, the said commissioners may adjourn, from time to time, until the said number of shares shall be subscribed, of which adjournments public notice shall be given in at least one public paper; and when the said subscriptions in the said books shall amount to the respective numbers aforesaid, the same shall respectively be closed; and if, on that day, and before the said subscriptions shall be declared to be full, applications shall be made to subscribe more shares than will fill the said book to the numbers aforesaid, respectively, then the said commissioners shall apportion the whole number of shares unsubscribed on the morning of that day among all those who shall have subscribed, or offered to subscribe, as aforesaid, on that day, by deducting from the subscribers of more shares than one such proportion of the shares by them respectively subscribed as will, with the least fraction, and leaving every person one or more shares, come nearest to the exact number of shares aforesaid: *Provided always*, That every person offering to subscribe in the said book, in his own name, or any other name, shall previously pay to the attending commissioners ten dollars for every share to be subscribed, out of which shall be defrayed the expenses attending the taking such subscriptions, and other incidental charges, and compensation to the said commissioners, not exceeding two dollars to each of them for every day they shall be publicly employed in the said business; and the remainder shall be paid over to the treasurer of the corporation as soon as the same shall be organized, and the officers chosen, as hereinafter mentioned.

Sec. 2. *And be it further enacted by the authority aforesaid*, That, when one hundred persons, or more, shall have subscribed five hundred or more shares in the said stock, the said commissioners may, or, when the whole number of shares aforesaid shall be subscribed, they shall certify, under their hands and seals, the names of the subscribers, and the number of shares subscribed by, or apportioned to, each subscriber, to the Governor of this commonwealth; and thereupon it shall and may be lawful to and for the Governor, by letters patent, under the great seal of the State, to create and erect such subscribers into one body, politic and corporate, in deed and in law, with perpetual succession, and with all the privileges and franchises incident to a corporation, by the name, style, and title of "The President, Managers, and Company of the Delaware and Schuylkill Canal Navigation;"

and by such name the said subscribers, and such other subscribers as may thereafter become shareholders, not exceeding the number of two thousand as aforesaid, shall be able and capable of holding their said capital stock, and the increase and profits thereof, and of enlarging the same, from time to time, by new subscriptions, in such manner and form as they shall think proper, if such enlargement shall be found necessary to fulfil the end and intent of this act, and of purchasing, taking, and holding to them, their successors, and assigns, in fee simple, or for any lesser estate, all such lands, tenements, and hereditaments, as shall be necessary for them in the prosecution of their work, and of doing all and every other act, matter, and thing which a corporation or body politic may lawfully do.

Sec. 3. *And be it further enacted by the authority aforesaid*, That it shall and may be lawful for the said president and managers to take water from the river Schuylkill, by means of a canal, beginning at any place on the easterly side of the said river, between the upper side of the mouth of Stony creek, at Norriton, and the north bound of the city of Philadelphia, where it strikes the said river, and to conduct the water thereof, by means of a canal, along the easterly bank of the said river, or as near thereto as the nature of the ground and intervening obstacles and impediments will admit; and from thence, to conduct the said water, as nearly parallel as may be, to the north bounds of the said city, by the most convenient route, to the river Delaware, the width of the said canal, at or near the place where it shall be taken from the river Schuylkill, not to exceed thirty feet; and no more water shall be drawn from the said river, than will pass through a thirty feet water way, which shall be erected of stone or wood by the said company, and be kept in constant repair, under the penalty of forfeiting all the rights and immunities granted by this act; which water way shall be erected within the distance of one mile, at most, from the mouth of the said canal on the river Schuylkill; but no part of the said work shall be commenced, before the said president and managers shall have ascertained and paid for the value of the ground to be occupied by the said canal and works, as also for any damage which the owners may sustain, by means of such alienation, or otherwise, by means of the canal passing through their grounds, agreeably to the mode hereinafter directed: *Provided, always*, That wherever the said president and managers shall find it most convenient to commence the said canal, they shall have liberty to erect a wing from the easterly shore of the said river Schuylkill, extending up the stream, but not to extend more than one-third across the said river, except the said wing shall be erected at the upper side of the mouth of Stony creek, in which case it may extend to the head of the island opposite thereto; but the said canal shall not be commenced, and the said wing be erected, at any place which shall render the navigation of the said river dangerous, by forcing boats or rafts on the opposite shore, or on rocks or shoals, which they might otherwise have passed in safety; and if the said president and managers shall be of opinion that it may be advisable to construct a canal between the said rivers Schuylkill and Delaware, by means of lock navigation, to be supplied with water from the streams lying between the north bounds of the city of Philadelphia, and the distance of eight miles therefrom, it shall and may be lawful for them so to do, and, to effect the same, shall have power to conduct any of the said streams into such canal, paying for the damage occasioned thereby in manner aforesaid.

Sec. 4. *And be it further enacted by the authority aforesaid*, That the said president and managers shall have power to form dry and wet docks, for the accommodation of vessels, near the city of Philadelphia, to communicate with the waters of the said canal, and to supply the city of Philadelphia, and the neighborhood thereof, with water, by means of pipes and other conductors, under the public roads, streets, and alleys, conveying water from thence for the use of such persons as will agree to pay for the same such annual prices as shall be established by the said president and managers: *Provided, always*, That they shall immediately repair any injury which they may do to said roads, streets, or alleys, by means of laying down or repairing any of the said pipes or conductors, and give as little obstruction to the use of the said roads, streets, or alleys, as the nature of the works will admit: *Provided, also*, That the said company shall not be entitled to any greater price for water to supply the city, and neighborhood thereof, than will create the annual profit of ten per centum on the capital that may and shall be expended for that particular purpose, exclusive of the general expense of the canal.

Sec. 5. *And be it further enacted by the authority aforesaid*, That the seven persons first named in the said letters patent shall, as soon as conveniently may be, after sealing the same, give notice in three of the newspapers, published in the city of Philadelphia as aforesaid, of a time and place by them to be appointed, not less than thirty days from the time of issuing the said notice, at which time and place the said subscribers shall proceed to organize the said corporation, and shall choose, by majority of votes of the said subscribers, by ballots, to be delivered in person or by proxy, one president, twelve managers, one treasurer, and such other officers as they shall think necessary to conduct the business of the said company, for one year, and until such other officers shall be elected; and shall or may make such by-laws, rules, orders, and regulations, not inconsistent with the constitution and laws of this commonwealth, as shall be necessary for the well ordering of the affairs of the said company: *Provided, always*, That no person shall have more than twenty votes in the said elections, or in determining any question arising at such meeting, whatever number of shares he may be entitled to, and that each person holding one or more shares, under the said number of twenty, shall have one vote for every share by him held.

Sec. 6. *And be it further enacted by the authority aforesaid*, That the said company shall meet on the first Monday of January, in each succeeding year, at such place as shall be fixed by the rules and orders of the said company, to be made as aforesaid, for the purpose of choosing such officers as aforesaid for the ensuing year; and at such other times as they shall be assembled by the managers for the purpose of making by-laws, rules, orders, and regulations, not inconsistent with the constitution and existing laws of this State, as shall, from time to time, be necessary; of which meetings previous notice shall be given, in such manner as shall be provided by such rules and orders.

Sec. 7. *And be it further enacted by the authority aforesaid*, That the said president and managers shall procure certificates to be printed or written, for every share of the capital stock of the said company, and deliver one to each subscriber, signed by the president, and sealed with their common seal, he paying to the treasurer of the company the sum of twenty-five dollars for every share by him subscribed, which certificate shall be transferable at his pleasure, in the presence of the treasurer of the said company, subject, however, to all payments due and to grow due; and the holder of every such certificate, having first caused the assignment to him to be entered into a book of the company, to be kept for that purpose, shall be a member of the said corporation, entitled to one share of the capital stock, and of all the estate and emoluments of the company, and to vote as aforesaid at the general meetings thereof.

Sec. 8. *And be it further enacted by the authority aforesaid*, That the said president and managers shall have full power and authority to appoint all officers necessary to supply vacancies by death, resignation, or otherwise, and also to appoint one or more superintendents of the works to be undertaken by them, and to hire and employ all such engineers, artists, workmen, and laborers as they shall find necessary to carry on the same; and by the said superintendent, engineers, artists, workmen, and laborers, to enter into and upon all and singular the land and lands, which may be deemed most convenient for accommodating the said canal navigation, and to lay out and survey such route or tracks as shall be deemed most practicable for effecting a navigable canal between the rivers Delaware and Schuylkill, near the said city, by means of locks and other devices, conformably to the provisions in

the third section of this act, doing, nevertheless, as little damage as possible to the ground and enclosures in and over which they shall pass; and, thereupon, it shall and may be lawful to and for the said president and managers to contract and agree with the owners of any lands and tenements, for the purchase of so much thereof as shall be necessary for the purpose of making, digging, and perfecting the said canal, and of erecting and establishing all the necessary locks, works, and devices, to such a navigation belonging, if they can agree with such owners; but, in case of disagreement, or in case the owner thereof shall be *feme coverte*, under age, *non compos mentis*, or out of the State, or otherwise incapacitated to convey, then it shall and may be lawful to and for the said president and managers to apply to two of the justices of the supreme court of this commonwealth, who, upon such application, are hereby authorized and empowered, enjoined, and required, to frame and issue one or more writ or writs, as occasion shall require, in the nature of a writ *ad quod damnum*, to be directed to the sheriff of the county in which such lands and tenements shall be, commanding him, that by the oaths and affirmations of twelve good and lawful men, of his bailiwick, who shall be indifferent to the parties, he shall inquire whether the person or persons owning any lands and tenements necessary to be used by the said president and managers, or which shall be injured in establishing the said canal and navigation, which person or persons shall be named, and which lands and tenements shall be described in such writ or writs, will suffer and sustain any, and what, damages, by reason or means of taking any such lands, tenements, or other real hereditaments, necessary for the use of said canal and navigation, and the locks and works thereto belonging, and to return the same writ, together with the finding of the said jury, to the next supreme court of this commonwealth after such finding; and upon such writ being delivered to the said sheriff, he shall give at least ten days' notice, in writing, to all and every the owners, or their representatives, of the lands and tenements in the said writ described, of the time of executing the same, and shall cause to come upon the premises, at the time appointed, twelve good and lawful men, of his bailiwick, who shall be selected in such manner as struck juries usually are, to whom he shall administer an oath or affirmation, that they will diligently inquire concerning the matters and things in the said writ specified, and a true verdict give, according to the best of their skill and judgment, without favor or partiality; and thereupon the said sheriff and inquest shall proceed to view all and every the lands and tenements, or other real hereditaments, in such writ specified, and having considered the quantity and quality thereof, which shall be necessary to be vested in the said company, for the purposes aforesaid, they shall cause the same to be minutely and exactly described, by metes and bounds, or other particular descriptions, and shall value and appraise the injury and damages which the owner or owners of the said lands, tenements, or other real hereditaments or improvements, will, according to their best skill and judgment, sustain and suffer, by means of so much of the said lands, tenements, or other real hereditaments or improvements, being vested in the said company, or by means of any works being destroyed, or rendered useless or of less value, or by means of the said company being permitted to turn any water course, for the use of the said canal, or by means of said company being permitted to enlarge any pond or water course, and to use the same for the purposes aforesaid, or by any other means whatsoever, defining and ascertaining, as well all such lands and tenements, liberties, and privileges, so to be vested in the said company, as the several sums at which the said injuries and damages shall be so assessed; and the said sheriff and jury shall make an inquisition, under their hands and seals, distinctly and plainly setting forth all the matters and things aforesaid, and the sheriff shall forthwith return the same, together with the said writ, to the office of the prothonotary of the supreme court; and at the first supreme court which shall be held next after the return of any such writ, the justices of the said court shall examine the same; and if the said writ shall appear to have been duly executed, and the return thereof be sufficient to ascertain the lands and tenements, rights, liberties, and privileges intended to be vested in the said company, and the several compensations awarded to the owners thereof, then the said court shall enter judgment, that the said company, paying to the several owners, as aforesaid, the several sums of money in the said inquisition assessed, or bringing the same into the said court, over and besides the cost of such writ, and of executing and returning the same, shall be entitled to have and to hold to them, and their successors and assigns forever, all and every the lands, tenements, rights, liberties, and privileges, in the said inquisition described, as fully and effectually as if the same had been granted to them by the respective owners thereof; and if any return so to be made shall not be sufficiently certain for the purposes aforesaid, the said court shall award inquisition *de novo*.

Sec. 9. *And be it further enacted by the authority aforesaid*, That whenever the said canal shall cross any public or private laid out road or highway, or shall divide the grounds of any person into two parts, so as to require a ford or bridge to cross the same, the jury, who shall inquire of the damages to be sustained in any manner herein directed, shall find and ascertain whether a passage across the same shall be admitted and maintained by a ford or bridge; and, on such finding, the said president and managers, and company, shall cause a ford to be rendered practicable, or a bridge, fit for the passage of carts and wagons, to be built, and forever after maintained and kept in repair, at all and every the places so ascertained by the said jury, at the cost and charges of the said company; but nothing herein contained shall prevent any person from erecting, and keeping in repair, any foot or other bridge across the said canal, at his own expense, where the same shall pass through his ground, provided the same shall be of such a height above the water as shall be usual in the bridges erected by the company; and provided that such foot or other bridges, so to be erected by the owners of such lands, shall not interfere with any of the locks, or buildings, or other works of the company.

Sec. 10. *And be it further enacted by the authority aforesaid*, That the said president and managers shall have power and authority, from time to time, to fix the several sums of money which shall be paid by the subscriber or holder of every share of the stock of the said company, in part, or for the sum subscribed, and the time when each and every dividend or part thereof shall be paid, and the place where it shall be received; and shall give at least thirty days' notice, in three of the public newspapers, published in the city of Philadelphia, as aforesaid, of the sum or dividend, and the time and place of receiving the same; and if the holder of any share shall neglect to pay such proportions at the places aforesaid, for the space of sixty days after the time so appointed for paying the same, every such shareholder, or his assignee, shall, in addition to the dividend so called for, pay after the rate of five per centum for every month's delay of such payment; and if the same, and the said additional penalty, shall not be paid for such space of time, as that the accumulated penalties shall become equal to the sums before paid for and on account of such shares, the same shall be forfeited to the said company, and may and shall be sold by them, to any person or persons willing to purchase, for such prices as can be obtained therefor.

Sec. 11. *And be it further enacted by the authority aforesaid*, That it shall and may be lawful to and for the said president and managers, and their superintendents, engineers, artists, workmen, and laborers, with carts, wagons, wains, and other carriages, with their beasts of draught and burden, and all necessary tools and implements, to enter upon the lands contiguous or near to the said track of the intended canal and navigation, first giving notice of their intention to the owners thereof, or their representatives, and doing as little damage thereto as possible, and repairing any breaches they may make in the enclosures thereof, and making amends for any damages that may be sustained by the owners of such ground, by appraisement in manner hereinafter directed, and upon a reasonable agreement with the owners, if they can agree, or, if they cannot agree, then upon an appraisement to be made upon

the oath or affirmation of three, or, if they disagree, any two indifferent freeholders, to be mutually chosen, or, if the owners neglect or refuse to join in the choice, to be appointed by any justice of the peace of the county, and tender of the appraised value, to carry away any stone, gravel, sand, or earth, thereon, being most conveniently situate for making or repairing the said canal and navigation, and to use the same in carrying on the said works.

Sec. 12. *And be it further enacted by the authority aforesaid*, That it shall and may be lawful to and for the said president and managers of the said company, so soon as the said canal and navigation shall be perfected, to appoint such and so many collectors of tolls, for the passage of boats, vessels, and rafts, in, and through, and along the same, and in such places as they shall think proper; and that it shall and may be lawful to and for such toll collectors, and their deputies, to demand and receive, of and from the persons having the charge of all boats, vessels, and rafts passing through the said canal and navigation, and the locks thereto belonging, such tolls and rates, for every ton weight of the ascertained burden of the said boats and vessels, and for every hundred feet, cubic measure, of timber, and twelve hundred feet, board measure, of boards, plank, or scantling, in rafts, as the said president and managers shall think proper, at any lock or other convenient place at the said canal: *Provided*, That the amount of the said tolls shall not, in the whole, exceed the rate of one-sixteenth of a dollar per mile, for every ton of the burden of such boat or vessel, and for every hundred feet, cubic measure, of timber, and twelve hundred feet, board measure, of boards, plank, or scantling.

Sec. 13. *And be it further enacted by the authority aforesaid*, That, in order to ascertain the size of rafts and the tonnage of boats using and passing the said canal and navigation, and to prevent disputes between the supercargoes and collectors of tolls concerning the same, upon the request of the owner, skipper, or supercargo of such boat or raft, or of the collector of the said tolls, at any lock upon the said canal and navigation, it shall and may be lawful for each of them to choose one skilful person to measure and ascertain the size of the said rafts, or the number of tons which the said boat or vessel is capable of carrying, and to mark the said tonnage, so ascertained, in figures upon the head and stern of the said boat, in colours mixed with oil, and that the said boat or vessel, so measured and marked, shall be permitted to pass through the said canal and locks, for the price per ton to which the number of tons so marked on her shall amount to, agreeably to the rates fixed in the manner aforesaid; and if the owner, skipper or supercargo of such boat or vessel shall decline choosing a person resident within two miles of the place where such toll is payable, to ascertain the tonnage thereof, then the amount of such tonnage shall be fixed and ascertained by the person appointed for that purpose by the president and managers, or chosen by the said collector of tolls for the said company, and the toll shall be paid according to such measurement, before any such boat or vessel shall be permitted to pass the place where such toll shall be made payable by the said company: *Provided always*, That if any of the said boats shall have been marked on any other canal, the said collectors may admit the same as the rate of tonnage, unless they shall have cause to suspect that the same is not correct, in which case a new mark shall be painted, without defacing the old mark.

Sec. 14. *And be it further enacted by the authority aforesaid*, That, if any person or persons whatsoever shall wilfully and knowingly do any act or thing whatsoever, whereby the said navigation, or any lock, gate, engine, machine, or devise, thereto belonging, shall be injured or damaged, he or they so offending shall forfeit and pay to the said company fourfold the costs and damages by them sustained by means of such known and wilful act, together with costs of suit in that behalf expended, to be recovered by action of debt, in any court having jurisdiction competent to the sum due.

Sec. 15. *And be it further enacted by the authority aforesaid*, That the collectors of tolls, duly appointed and authorized by the said president and managers, may stop and detain all boats and vessels using the said canal and navigation, and also all rafts passing the same, until the owner, skipper or supercargo of the same, shall pay the tolls so as aforesaid fixed, or may distrain part of the cargo therein contained, or a part of such rafts, sufficient, by the appraisement of two credible persons, to satisfy the toll, which distress shall be kept by the collector of the tolls taking the same for the space of five days, and afterwards sold by public auction, at some public place in the neighborhood, to the highest bidder, in the same manner and form as goods distrained for rent are by law sold and saleable, rendering the surplus, if any there be, after payment of the said tolls, and the costs of distress and sale, to the skipper, or supercargo or owners thereof.

Sec. 16. *And be it further enacted by the authority aforesaid*, That the president and managers of the said company may demand and require of and from the said treasurer, and of and from all and every other the officers, superintendents, and other persons by them employed, bonds, in sufficient penalties, and with such sureties, as they shall by their rules, orders, and regulations require, for the faithful discharge of the several duties and trusts to them, or any of them, respectively committed.

Sec. 17. *And be it further enacted by the authority aforesaid*, That the president and managers of the said company shall keep fair and just accounts of all moneys received by them from the subscribers to the said undertaking, for their subscriptions thereto, and all penalties for delay or non-payment thereof, and of all moneys by them expended in the payment of the cost and charges of procuring and purchasing all estates, rights, and titles, in the said company to be vested in pursuance of this act, or by any other means, and in paying their several officers by them to be appointed, and the wages of the different engineers, artists, workmen and laborers, by them to be employed, and for the materials and work furnished and done in the prosecution of the works projected by the said company, and shall, once at least in every year, submit such account to the general meeting of the stockholders, until the said canal and navigation shall be completed, and until all the costs, charges and expenses of effecting the same shall be fully paid and discharged, and the aggregate amount of such expenses shall be liquidated; and from and after the liquidation thereof, if the works shall not be sufficiently perfected, or from any casualty should be injured, so as to require an increase of the capital stock, it shall and may be lawful to and for the said president, managers, and company, at a general meeting of the stockholders thereof, held in pursuance of the preceding provisions, or called by the president and managers of the company for the especial purpose, by public notice in three newspapers in manner aforesaid, (which shall be given three months previously to the opening of the said subscriptions,) to increase the number of shares to such extent as shall be deemed sufficient to acomplish the object of this act, and to demand and receive such additional subscriptions from the former, or, in case of their neglect and refusal, after ten successive days from the time of such meeting, from new subscribers, and upon such terms, and in such manner, as by the said general meeting shall be agreed on.

Sec. 18. *And be it further enacted by the authority aforesaid*, That the said president and managers shall also keep a just and true account of all and every the moneys received by their several and respective collectors of tolls on the said canal navigation, and shall make and declare a dividend of the clear profits and income thereof (all contingent costs and charges being first deducted) among all the subscribers to the said company's stock; and shall, on every the second Mondays of January and July, in every year, publish the half-yearly dividend to be made of the said clear profits to and amongst the stockholders, and of the time and place, when and where the same shall be paid, and shall cause the same to be paid accordingly.

Sec. 19. *And be it further enacted by the authority aforesaid*, That the said president and managers shall, at the expiration of every third year from the date of their incorporation, lay before the General Assembly of this commonwealth an abstract of their accounts, showing the whole amount of the capital expended in purchasing real estates, and in digging, erecting, and establishing the whole of the said canal, locks, and works, and the whole income and profits arising from the same, for and during the said periods, together with the exact amount of the contingent expenses of supporting, maintaining, and keeping the same in repair for the said periods, to the end that the clear annual profits may be known. And if, at the end of two years after the said canal and navigation shall be completed, it shall appear that the said clear profits and income will not bear a dividend of six per centum per annum on the whole capital stock of the said company so expended, then it shall and may be lawful to and for the said president, managers, and company to increase the tolls herein above allowed to them so much per ton as will raise the dividend up to six per centum per annum. And at the end of every period of ten years after the said canal shall be completed, they shall render a like abstract to the General Assembly of their accounts for three preceding years; and if, at the end of any such decennial period, it shall appear from such abstract that the clear profits and income of the said company will bear a dividend of more than twenty-five per centum per annum, then, and in such case, the said tolls shall be reduced so much per ton as will reduce the said clear profits and income to a dividend not exceeding twenty-five per centum per annum.

Sec. 20. *And be it further enacted by the authority aforesaid*, That whenever the profits of the said company shall amount to a clear annual dividend of fifteen per centum on the whole amount of their capital stock so expended, there shall then be reserved one per centum per annum out of the same, which shall be applied, under the direction of the Legislature, for the establishment of schools, and the encouragement of the arts and sciences in one or more seminaries of learning.

Sec. 21. *And be it further enacted by the authority aforesaid*, That if the said company shall not proceed to carry on the said work within the space of two years from the passing of this act, or shall not, within the space of ten years from the passing of this act, complete the same canal and navigation, so as to open an easy and safe water communication from the river Schuylkill to the river Delaware, which canal or water shall be of the depth of three feet, and the width of at least twenty-four feet, then, and in either of those cases, it shall and may be lawful for the Legislature of this commonwealth to resume all and singular the rights, liberties, and privileges hereby granted to the said company.

WILLIAM BINGHAM,
Speaker of the House of Representatives.
SAMUEL POWELL, *Speaker of the Senate.*

Approved, April 10, 1792.

THOMAS MIFFLIN,
Governor of the Commonwealth of Pennsylvania.

AN ACT to incorporate the Conewago Canal Company.

Whereas the General Assembly of this commonwealth did, in and by an act, entitled "An act to provide for the opening and improving sundry navigable waters and roads within this commonwealth," authorize and empower the Governor to contract with individuals or companies, among other things, for improving the navigation of the river Susquehannah, from Wright's ferry to the mouth of Swatara creek, inclusive, and for that purpose appropriated the sum of five thousand two hundred and fifty pounds. And whereas a contract and articles of agreement were made and entered into on the third day of July, in the year of our Lord one thousand seven hundred and ninety-two, between Thomas Mifflin, Governor of the commonwealth of Pennsylvania, on behalf of the State, of the one part, and Robert Morris, William Smith, Walter Stewart, Samuel Meredith, John Steinmetz, Tench Francis, John Nicholson, John Donaldson, Samuel Miles, Timothy Matlack, David Rittenhouse, Samuel Powel, Alexander James Dallas, William Bingham, Henry Miller, Abraham Witmer, and Robert Harris, all of the State of Pennsylvania, of the other part, as a company, by the name of the Conewago company, for opening and improving that part of the river Susquehannah from Wright's ferry to the mouth of Swatara creek, inclusive, agreeably to the true intent, meaning, and design of the Legislature; whereby the said Robert Morris and others, as a company, and each of them, did agree, undertake, and contract, to and with the said Thomas Mifflin and his successors, governors of the said commonwealth, that they, the said company, will well and truly open and improve the navigation of the said river Susquehannah, between Wright's ferry and mouth of Swatara aforesaid, agreeably to the true intention of the Legislature, in the manner set forth in the said contract, reference being thereto had at large; and, particularly, that at the Conewago falls they will cut, establish, and maintain a canal of a sufficient and convenient width, not less than forty feet, of a length sufficient to pass and extend beyond all obstructions created in the navigation of the said river by means of the said Conewago falls, and of a depth sufficient at all times to contain and convey, through the whole distance of the said canal, a body of water at least four feet deep; and that they will also erect and maintain on the said canal a sufficient number of safe and commodious locks, not less than two, for the benefit of navigation; and that the said canal and locks, and the works thereunto belonging, shall be forever kept and maintained in good and perfect order and repair by them, the said contractors, their heirs, executors, administrators, and assigns, at the proper cost of them, and of every of them, and opened as a public highway and for public use forever, so that all persons whosoever, with boats, rafts, and other suitable vessels, and their freights, may thenceforth, at all seasons when the navigation of the said river Susquehannah is not rendered impracticable by ice, pass and repass in the said canal, and use and enjoy the benefit of the said locks, free of toll, and any and every other charge whatsoever, as freely as if the said canal and locks were made and established by the public, and duly declared by law to be a public highway. And whereas the said Thomas Mifflin, in behalf of this commonwealth, in consideration of the undertakings and contracts of the said company, did covenant and agree that they shall have and receive the sum of five thousand two hundred and fifty pounds, the sum appropriated by law, to be taken as full satisfaction and compensation of all their services and expenses in carrying on, completing, and maintaining the said works. And whereas it has been represented to the Legislature, by the said company, that no provisions having been made by the public to purchase the ground through which the said canal is to pass, for the distance of three hundred and six perches, more or less, nor to compel the owners to part with the same at a reasonable price or valuation for the public use, and that they have been obliged to purchase the same at their own expense, and at a very high rate, appropriating to the use of the public such part of their grounds as may be necessary to the said canal and works, the whole of which is to be constructed and maintained within the grounds so purchased; but that, in the execution of the said important work for the public use and benefit, as well as for securing and maintaining the necessary constructions and erections from trespasses and damages, the better managing their several shares, dividing and transferring the same, making and executing contracts for carrying on the work,

and the improvement of the natural advantages of their estates and interest in the lands contiguous to and connected with the said canal, (including the ferry at the lower end of the said Conewago falls,) they labor under many inconveniences, as a number of individuals, bound by temporary articles to the execution and support of a public work for permanent and perpetual use to the community at large, and have, therefore, prayed that they may be constituted into a body politic and corporate, with the powers, rights, and privileges incident and necessary to a corporation of the like nature and kind.

SEC. 1. *Be it therefore enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania in General Assembly met, and it is hereby enacted by the authority of the same*, That the said Robert Morris, William Smith, Walter Stewart, Samuel Meredith, John Steinmetz, Tench Francis, John Nicholson, John Donaldson, Samuel Miles, Timothy Matlack, David Rittenhouse, Samuel Powel, Alexander James Dallas, William Bingham, Henry Miller, Abraham Witmer, and Robert Harris, their successors and assigns, shall be, and they are hereby, incorporated into a body politic and corporate in deed and in name, by the name, style, and title of "The Conewago Canal Company;" and by the same name, style, and title, they shall have succession forever, and be able and capable in law to sue and be sued, to implead and be impleaded, and to have and to make one common seal to use in their affairs, and the same to break and alter at their pleasure; and to hold and enjoy any lands, tenements, goods, wares, and merchandise, and all manner of estates, real and personal, and mixed, provided the same shall not exceed at any time one million of dollars; and shall have power to meet, choose, appoint, and contract with all officers, servants, and persons necessary in the management of their affairs, and to do and perform such acts, and to make such rules, ordinances, by-laws, and regulations, (not inconsistent with the laws of the United States, and of this State,) as they, or a majority of them, shall, from time to time, find convenient, useful, and necessary for establishing and maintaining the said canal and locks, and the works thereunto belonging or connected with the same; and in general for the better managing and promoting the interests of the said corporation and company, and the improvement of the natural advantages of their estate in the premises, in as full and ample a manner as any other corporate body within this commonwealth can or may do.

SEC. 2. *And be it further enacted by the authority aforesaid*, That the said canal and locks shall be, and the same are hereby, declared to be, a public highway, and as such shall be kept and maintained by the said corporation and company for public use forever, so that all persons with boats, rafts, and other suitable vessels, with their freights, may at all seasons, when the navigation of the river Susquehannah and the said canal is not rendered impracticable by ice, pass and repass in the same, and use and enjoy the benefit of the said locks free of toll, and any and every other charge whatsoever; and the said company shall keep and maintain a skilful person for opening and shutting the locks, and for assisting the boatmen in their passage through the same.

SEC. 3. *And be it further enacted by the authority aforesaid*, That, if any person or persons whatsoever shall, wilfully and knowingly, do any act or thing whatsoever, whereby the said navigation, or any lock, gate, engine, machine or device, thereto belonging, shall be injured or damaged, he, she, or they, so offending, shall forfeit and pay to the said company fourfold the costs and damages by them sustained by means of such known and wilful act, together with costs of suit in that behalf expended, to be recovered, by action of debt, before any justice of the peace, or in any court having jurisdiction competent to the sum due.

SEC. 4. *Provided always, and be it further enacted by the authority aforesaid*, That nothing in this act contained, shall be held, deemed, taken, or in anywise understood to invalidate the contract had and made between the Governor of this commonwealth and the said company, for completing the said canal and locks in the manner, and in the time therein specified, nor to release the said company, or any of them, from their responsibility, each for the other, jointly and severally, in the due and faithful execution of the work, according to the true intention of the Legislature, as specified and set forth in the said contract.

GERARDUS WYNKOOP,
Speaker of the House of Representatives.
SAMUEL POWEL,
Speaker of the Senate.

Approved, April 10, 1793.

THOMAS MIFFLIN,
Governor of the Commonwealth of Pennsylvania.

SCHUYLKILL AND SUSQUEHANNAH CANAL NAVIGATION.

To the Senate and House of Representatives of the Commonwealth of Pennsylvania in General Assembly met:

The president, managers, and company of the Schuylkill and Susquehannah navigation, with every sentiment of respect and grateful acknowledgment of that protection, encouragement, and support, which they have received from the Legislature in the carrying on the great work committed to their trust and direction, beg leave to submit to the consideration of the General Assembly, an account of the work already executed, the moneys expended, the plan and probable expense of the work remaining to be accomplished, and the prospect of an effectual completion of the whole undertaking within the time limited by law.

The magnitude and immense importance of the system of roads and inland navigation projected, and now in rapid progress through the various parts of the State, as tending to the increase of our commercial and agricultural interest, to the general prosperity of our citizens of every class and degree, and strengthening the bands of their union to the most distant parts of the State, need not be mentioned to an enlightened Legislature, which hath nursed this great work, by the aid of public money from the beginning, and hath incorporated and encouraged companies with liberal franchises, for carrying on and completing the same.

Within the whole habitable globe, there is not a country, of equal dimensions, which offers to its industrious inhabitants more resources of wealth, independence and happiness, than Pennsylvania; considering the salubrity of climate, the fertility of soil, the variety of produce and manufacturing materials, and the means of communication by improved roads and the inland navigation of our great rivers and their numerous branches, embracing and interlocking with each other, and spreading themselves (up to their sources) through all the parts of the State; and forming water communications by sundry routes, from the tide waters of Delaware and the Atlantic, to the great lakes and extreme bounds of the United States.

The canal which is to connect the Schuylkill and Susquehannah navigation, is the chief link of this vast chain; a link on which the success and utility of the whole must necessarily depend.

The summit level of this canal, between Lebanon and Myerstown, for upwards of three miles is completed; in respect to the heavy digging, and the purchase of all the ground for the site of the canal, the locks and towing

paths, as well as the grounds containing the sources and springs of waters, and through which they are to be conducted into the reservoir at the summit level. The exorbitant price allowed by juries for some of the lands and waters necessary to the work, has considerably enhanced the expense of this part; but a sufficiency of water to fill the canal and locks at the middle ground was of such essential consequence to the success of the undertaking that the whole system of our inland navigation must have been deranged, and have become abortive, if the managers had been deterred, or slackened their exertions on account of the expense, which, after all, does not greatly or disproportionably exceed the original estimates for the middle ground; and the final amount of expenditures on this part will not be above forty thousand pounds.

The two remaining parts of this grand communication under our direction, are—

1. The Tulpehocken canal navigation, from the east end of the middle ground, down to Schuylkill at the mouth of Tulpehocken, being, by the courses of the creek and along its margin, thirty-five miles.

2. The Quittapahilla and Swatara navigation, from Lebanon to Susquehannah, being thirty-two miles.

The report of our engineer, his plan and estimates, together with his able and judicious arguments and reasons for preferring, generally, a canal navigation along the margin, to the natural bed of the waters (as being a more complete navigation, with less injury to the meadows or mills of the land holders, and, on the whole, at an expense not so much greater as to be placed in competition with the permanent advantages to be derived from it) are herewith submitted to the Legislature.

But the original calculations, on framing the act by which we were incorporated, were grounded upon the presumption that the natural beds of those rivers, by means of dams and locks, might answer the purpose of a temporary navigation, with little more than eight or ten miles digging on the whole; whereas, on the present improved plan, (which will remain of permanent emolument to the State, so long as those rivers continue to run,) the expense will be about thrice the sum first contemplated, as will appear by the annexed estimate. It is an expense, however, (considering the magnitude of the undertaking,) which can, by no means, be viewed as beyond the powers of this State, and is a prize worthy of their public spirit, and utmost exertions to see accomplished. Your memorialists, therefore, cannot but entertain the most sanguine expectations of the aid and encouragement of the Legislature in prosecuting and completing the work.

By the estimates hereto annexed, it will appear that, in order to complete the navigation upon a permanent foundation, through the distance of about seventy miles, (from the mouth of Tulpehocken on Schuylkill, to the mouth of Swatara, on Susquehannah,) there will be a deficiency of £308,000; but the trade which may reasonably be expected through this immense communication with the western world will amply compensate the public, as well as the individual stockholders, for the capital stock to be employed in the work.

There are but two ways to raise this capital—

1. Either by enlarging the present capital, by the increase of shares and new subscriptions, on the terms of the act of incorporation; or

2. By the company's negotiating and obtaining an effectual loan.

A loan, in the opinion of the stockholders, and agreeably to their resolutions, at a meeting held to consider the state of their affairs, is the mode they would prefer; and, therefore, they have instructed the president and managers to pray the Legislature, and they accordingly pray—

For an aid in money to the amount of the said deficiency, or as much thereof as the Legislature may think proper to grant; either by lending the same to the company on interest, at the rate of six per centum per annum, the principal of the loan to be advanced by the State to the company in monthly instalments of ten thousand dollars each,) or by the State taking an interest in the work for the speedy accomplishment of the same, to the amount of the deficient capital, or such part thereof, as, in regard to the public emolument, they may think meet, and that, in case the loan shall be granted, as aforesaid, the corporation engage to pay the same with interest, by instalments of not less than fifty thousand dollars annually; the first instalment to be paid at the end of twelve months after the work shall be finished, and the commencement of the tolls thereon.

That, as by the act of incorporation, although some parts of the said canal navigation may be finished, and in use before the whole distance of seventy miles can be completed; yet the company are not enabled to receive toll for that part except at the rate of one dollar for every seventy miles, or the whole distance, which is only one cent and three-sevenths of a cent per mile; whereas the Delaware and Schuylkill canal is allowed one-sixteenth of a dollar per mile, whenever any part thereof is finished; and although a remedy is given for this inequality by the sixteenth section of the act of incorporation, which provides "that the company may increase the toll, if it should appear that the clear profits and income will not bear a dividend of six per centum per annum on the whole capital stock of the company expended, in such manner that the tolls will raise the dividend to six per centum per annum through the whole length of the canal and navigation, and in proportion for each separate part thereof;" yet this remedy cannot be applied to any particular part, till at the end of two years after the whole of the said canal and navigation shall be completed. Your memorialists are, therefore, instructed by the stockholders further to pray, and they do pray, that the Legislature will grant such toll per mile, for any part of the canal that may be finished, as is allowed on the Delaware and Schuylkill canal, under the same restrictions, for that part of the canal so finished, as are provided in the said sixteenth section of the act of incorporation, on the finishing of the whole canal.

By order, and on behalf, of the corporation,

ROBERT MORRIS, *President.*

Report of William Weston, Esq., engineer and superintendent, &c. To the President, Managers, and Company of the Schuylkill and Susquehannah Navigation.

GENTLEMEN:

Pursuant to an order of the board, made in April last, I have now the honor to lay before you a plan and estimate of that part of the Schuylkill and Susquehannah canal, which extends from the east end of the summit level to the junction of the Tulpehocken with the river Schuylkill, near Reading. Independent of other circumstances, I purposely delayed the survey of the intended line until autumn, as by that means I had an opportunity of viewing the creek in its lowest state. My instructions directed me to explore the Tulpehocken, the adjacent ground, and any other practicable course by which a navigable canal might be made to the Schuylkill. I had conceived very sanguine hopes in favor of the practicability of the latter mode, as I had been informed, by persons well acquainted with the face of the country, that there was a probability of finding a more direct route to the Schuylkill than by following the circuitous windings of the Tulpehocken. But, on a very attentive view, I do not hesitate to declare that it is impracticable to deviate from the course of the creek, which, from its source to its mouth, is environed with hills, so as to render it impossible to leave its banks at any considerable distance, as will be seen by an inspection

of the plan. One of the two remaining modes must, therefore, be adopted, viz: a canal navigation totally unconnected with the river, or, by using the beds of the present creeks, and making such improvements as they are capable of. I have well considered every argument that has been advanced in favor of, and every objection that has been made against, the latter mode. After stating, with as much perspicuity as I am able, the reasons that have influenced my determination, I shall leave it to the board to adopt that plan which to them appears most eligible. The contest between river navigation and canals is an old one. Many very plausible arguments have been adduced in favor of the former, and, until time had proved their fallacy, they had much weight, as may be conceived from the many fruitless attempts that have been made in England to render navigable the river Avon, from Stratford to Tewksbury, the Stour to the Severn, the Severn from Shrewsbury to Worcester, the Irwell, the Kennet, the Mersey, and the Thames from Crechlade to the tide water; the last of which rivers has employed the abilities of the first engineers for more than a century to no purpose; for, after immense sums have been expended upon it, it is now so imperfect as to be unnavigable six months in the year. A collateral canal has been recommended as much cheaper; but the prejudices of corporations, millers, and land owners have hitherto prevented the adoption of this plan. The unerring test of experience has at length convinced the warmest advocates for river navigations how inefficacious they are. I have mentioned the above instances, as practical examples are more conclusive than theoretical arguments. It should also be remembered that the danger to be encountered in this country is much greater than in England, as the floods are more violent and accompanied by ice in greater quantities. The usual method of making rivers navigable is to throw dams across the stream in the most convenient situations, and to build a lock in a collateral channel, to enable the boats to pass from one pond to the other. To obtain the necessary depth of water, the bed of the river, at the tail of each lock, must be deepened, or the water raised so much by the next dam as to effect the same purpose. In the instance before us, the former mode may be deemed impracticable, the bed of the creek being chiefly solid work. The latter is liable to the following objections: To obtain the requisite depth, the water will be raised higher than the adjacent meadows; to prevent their being overflowed, an embankment must be made, which obstructs the natural drainage from the meadows. This may be remedied by cutting a back drain to the tail of the next lock; but, in many instances, it will be impracticable. These banks are liable to be destroyed every winter by the floods, if raised only to the height necessary to pen up the water, as they will not be sufficient to confine the river in its bed at that time; and, if it overflows, it will inevitably destroy them. To prevent this, it follows that the banks should be raised sufficiently high, and of a proper strength to resist every effort of this powerful element. I am not so well acquainted with the state of the Tulpehocken, in the winter season, as to assign the just dimensions of these embankments, which will vary with the increase of its stream by every new accession of water. But, from the best information which I have been able to collect, I have reason to believe they will destroy as much land, and be nearly as expensive as cutting a canal; and, when every precaution has been taken that human ingenuity can suggest, they are in continual danger of being destroyed; and that these instances are far from being rare the works on the rivers I have before mentioned will evince, having been frequently swept away. The lifts of the locks on the canal will be, on an average, seven feet; but on the river it would not be prudent to make them more than four or five feet. This circumstance, by increasing the number of locks, will add considerably to the expense of execution, as the difference between a four feet and seven feet lock is not so much as may be imagined. For the ease and convenience of hauling, and also for its stability, a towing path should be as little elevated above the surface of the water as possible; but as, in the most favorable seasons, the water will be continually fluctuating, it would be necessary to raise it at least three times its usual height; and then it will be considerably damaged every flood. If the Tulpehocken was in a permanent state, it would be much less difficult to render it navigable; but its variations, both from natural and artificial causes, being so great, it will be almost impossible to assign a just proportion of fall and lockage, to acquire the opposite advantages requisite in a summer and winter season. The above are the most material objections that occur to me at present. The only argument advanced in favor of river navigation is, that they are less expensive in the execution. What the saving may amount to, in the case before us, is difficult to ascertain; but it will not be of any consequence when put in competition with the manifest advantages of a canal navigation; and the necessary annual repairs will, I am persuaded, amount to as much as the interest of the principal sum saved in the execution. As far as my opinion will influence the board, it is necessary to declare that, taking every object into consideration, I recommend, as most subservient to their immediate interest, and beneficial to the public at large, the adoption of a canal navigation, independent of the Tulpehocken, except in such instances as nature or art render it expedient to deviate therefrom. These particular cases will be pointed out in the course of the annexed description of the proposed line. Having done my duty by declaring my opinion, it only remains for me to assure the board that, whatever their decision may be, I shall execute their orders with as much alacrity as if my recommendation had been adopted.

The plan herewith exhibited will give the board a better information respecting the appearance of the country, the direction of the canal, and the course of the Tulpehocken, than could be conveyed by words. The track of the canal is shown by a red line; and, though I may hereafter find it expedient to vary therefrom, in some few instances, these variations will be so trifling as not to cause any sensible alteration in the plan.

The water courses intended to convey the several springs into the summit level of the canal are distinguished by different colors, which the table of reference on the plan will explain. In placing the locks, particular regard has been paid to their situation and lift, so as to combine the double advantage of suiting the ground, and affording the easiest communication with the divided lands, by bridges over the tails, which saves two hundred pounds in every instance. In a first survey it cannot be expected that every local circumstance can be comprehended. I may hereafter see sufficient reasons to induce me to make some alteration in their situation and lift; whenever that is done, it will be from economical motives. The ground in Loy's plantation would have admitted the lifts of the locks to have been ten feet; but, as it would have caused a considerable additional expenditure of water, I have deemed it most eligible to fix them at six feet; and this has been continued until additional supplies of water have justified increasing the falls of the subsequent locks.

The regular and uniform descent of the ground in the vicinity of the Tulpehocken prevents us having locks of more than eight feet fall, as the extra digging at the tail of each lock would be more expensive than the saving of an increased lift. On account of the proximity of the hills on each side of the Tulpehocken, the canal is obliged to keep very near the channel, and, consequently, in the meadows. This circumstance makes it very unpopular with the farmers; but it cannot be avoided, as any other course would enhance the expense of execution infinitely more than any consideration which will be made for the land. In the following estimate I have been as particular and accurate as the uncertainty of works of this kind will admit. I trust it will be found that sufficient allowance has been made for the execution. In some instances I may have overrated, and in others undervalued, the contingent expense; but I believe the average will be found very near what I have allowed it. Not to depend altogether upon appearances, to form a judgment of the quality of the ground through which the canal passes, I caused it to be bored in every field. I found the strata generally the same, viz. black earth, clay of different kinds, gravel, and rock, on which the borings mostly terminated, but at irregular depths from the surface, viz: from one

to six feet. The rock, in general, lies sufficiently deep from the surface to permit the canal to be cut without interfering with it. When it lies near the surface, I shall cause it to be accurately examined before the canal is set out, and shall regulate the locks accordingly. It has been a common complaint (and experience in general has evinced the justice of it) that the estimates of most public works have fallen considerably short of the sums afterwards actually expended in their execution. Whatever may have been the motives for these deceptions, they have not influenced me. The following estimate (though not greater than the majority of the English canals of the same length have cost) would not have been so high but for the unusual quantity of lockage, and the peculiar disadvantages it labors under in being far removed from most of the necessary materials, particularly stone and sand. However, the execution of the work will be as economical as possible, as I shall let all the work by contract that can be done with propriety.

The important article of lockage, I am well persuaded, will be found accurate. Bridges, the next object, I am not so confident of with respect to number. I have allowed them in all places where I suppose them necessary, but perhaps a jury may think otherwise. It would be advisable, in many cases, for the company to purchase the land cut off by the canal, as it is very rarely worth the expense of erecting a bridge, and very frequently not a fourth part. These parcels of land, if purchased and re-sold to the owners of the adjacent plantations, would save some thousand pounds. In the estimate I have not included the value of the land necessarily destroyed by the canal; this rests entirely with the juries, who have hitherto differed so much in their valuations, that no certain idea can be formed of it. In the article of fencing there would be a considerable saving by introducing the modern mode of towing path gates at the division of every enclosure.

The following description of the nature of the ground, through which the canal passes, aided by a reference to the plan, will convey as just an idea of it as can be obtained by any other mode than ocular observation: Beginning at the line of Michael Loy, the summit level is continued twenty-two perches to the head of the first lock, between which, and Michael Loy's road, there will be six other locks of six feet fall each; at the tail of the seventh lock we shall acquire a considerable accession of water, by taking in two copious streams which rise in the spring-houses of Loy and Spangler; from this place, therefore, the canal may be considered as abundantly supplied with water at all seasons. Leaving Leonard Immel's and Michael Ramler's on the south, the canal passes through the meadows to the west end of Bassler's mill-dam, across which an embankment must be made for a towing path, three hundred and twenty yards in length, with a waste wear under it to discharge the superfluous water into the mill-pond.

The tenth lock is intended to be placed at the road from Myerstown to Lebanon, with a bridge over the tail. Leaving Myerstown about a quarter of a mile to the northward, the canal passes through the lands of Simon Bassler and John Myers to Valentine Miller's, in very favorable ground; from thence to the line of John Kuster is one continued rock, in length forty perches; this part will be very expensive; I have considered it in the estimate as cut through the solid rock; but if, on trial, it should prove difficult to quarry, I shall bank over it as the cheapest mode. Through the plantations of Kuster, Haag, Kreitzer, and Wolborn, the ground in general is good. Through Sharf's plantation it will be rocky; but, by adapting the fall of the preceding lock to suit the level of the ground, it may, in a great measure, be avoided. Near the great spring the Tulpehocken makes a considerable elbow, as will be seen by the plan; the canal is laid down as crossing the isthmus. Of the propriety of this route I am not fully satisfied; the distance does not exceed twenty-two perches, but it is composed wholly of rocks in distinct but large masses. To cut the canal through these, and also a new channel for the Tulpehocken, will certainly be very expensive.

The next mode of execution is to carry the canal over the Tulpehocken, by means of two small aqueducts, and to bank across the isthmus; another mode is to make use of the bed of the river, which may be rendered navigable by erecting a dam at the second intersection, sufficient to raise the water to the requisite height. The first plan is the most perfect, and the last most economical. I am not now prepared to speak decisively on this point; but, before it is set out, I shall carefully examine the ground, and adopt that mode which shall appear most eligible. From the great spring no material obstacle occurs till we arrive at Lower's mill-dam. Here there are two routes; the first through the hill to the northward of the mill; the other by an embankment through the dam; this last is the most preferable, as being much the cheapest. In the estimate I have divided the canal into five districts, the first of which terminates at this place. The length is six miles four furlongs and six chains, and the fall one hundred and nine feet seven inches. From Lower's to Lechner's mill, the ground is various in quality, but in general it is not unfavorable. In many places it will be necessary to cut a new channel for the river, as it frequently runs so near the hills as not to leave a sufficient width for a canal and towing path; it will be unnecessary to specify these instances particularly, as they will be shown more plainly on the plan where they are denoted by a blue line. At Lechner's, the canal will pass through the hill between the mill and a small out building; at this place I propose to contract the width of the canal to eleven feet, admitting the passage of one boat only at a time; the length of this hill is twenty perches. From Lechner's the canal passes through the plantations of Lantz, Read, Kortz, Brown, Sheafer, and Meyer, in favorable ground. The course of the canal, through Debe's meadow, might have been more direct; but as the circuitous tract, laid down on the plan, saves a bridge, it will be the cheapest. At Edge's it will be advisable to make use of the present dam; indeed there is no alternative, as the hill, on the west side, approaching nearly perpendicular to the water edge, precludes every idea of making a canal in this place. All that is necessary here will be to make a towing path, elevated about three feet above the surface of the water, that being the height to which the floods generally rise in the winter season. This is the end of the second district, which is five miles seven furlongs, and two chains in length, and the fall is fifty-four feet eleven inches, divided into eight locks. Leaving the mill-dam by the new race cut to the slitting mill, the canal passes through the plantations of George Ege, Deppe, Lutz, and Clinger to Forrar's mill. From this place to the North hill creek the ground is very irregular in quality. In the wood, belonging to Jasper Stump, the canal crosses the North hill; at the time I viewed it the stream was very trifling, but from the appearance of its banks, and the width of the channel, it must be very considerable in the winter season. Until I am better acquainted with it I cannot determine upon the most eligible mode of crossing it, whether by an aqueduct or a tumbling dam. The latter will be the cheapest, but the most inconvenient for the boats. The third district terminates here; the length is six miles and seven furlongs; and the fall forty-eight feet eight inches, which I have divided into six locks. From hence the canal passes through the plantations of Shomo, Stouch, Geis, and Dunder, to Stouch's mill. From this place to Heister's mill the ground is various in quality and irregular in surface; a considerable portion is rock, the particulars of which will be specified in the estimate. From Heister's mill to Raeber's, the canal proceeds in very favorable ground; at this place the river must be turned from its natural course, which will be occupied by the canal. From Raeber's the line of the canal runs through the plantations of Bon, Ruhl, John Raeber, to Read's mill, near which the fortieth lock is placed. From Read's mill to the Schuylkill, the ground on each side of the Tulpehocken, with very few exceptions, is so extremely irregular and rocky, that, on account of the enormous expense that would be incident to a canal navigation, it will be the most eligible mode to make the

Tulpehocken navigable by means of dams and side locks. The ground on each side of the creek is well adapted to this purpose; in most places it will require no banking, nature having already performed that office; and in those places, where the water will be raised above the surface of the adjacent land, it is of so little value as to render the purchase of it an object of little importance. The length of this district, extending from Heister's mill to the Schuylkill, is eight miles seven furlongs and four chains, and the fall sixty-seven feet eleven inches. The total length of the canal, from the east end of the summit level to the Schuylkill, is thirty-four miles one furlong and six chains; the fall three hundred and ten feet, divided into forty-five locks.

I have the honor to be, gentlemen, your most obedient humble servant,

JANUARY 15, 1794. WILLIAM WESTON.

General estimate of the probable cost of completing the canal from Schuylkill to Susquehannah.

	Length.	Fall.		Amount.
	miles. fur.	feet. inches.	£. s. d.	£. s. d.
For the crown level from near Lebanon to Michael Loy's, nearly completed, upwards of three miles,	-	-	-	40,000 00 0
From the summit to Lower's mill, - -	6 4-6	109 7	54,233 0 11½	
From Lower's to Ege's, - - -	5 7-2	54 11	30,575 7 1½	
From Ege's to the North Hill, - -	6 7	48 8	30,819 2 3	
From North Hill to Heister's, - -	5 7-4	28 11	26,848 10 3¾	
From Heister's to the Schuylkill, - -	8 7-4	67 11	43,894 15 6¼	
				186,370 16 2
Cost of land already valued, - -	-	-	-	8,051 00 0
Cost of land necessary on the same estimate, -	-	-	-	15,300 00 0
Ten houses for clerks and toll-gatherers, -	-	-	-	1,500 00 0
Supposed damages to lands, mills, water, &c. -	-	-	-	4,700 00 0
Salaries, office hire, and incidental charges, for all persons employed by the company for four years,	-	-	-	10,078 3 10
Whole cost from Lebanon to Schuylkill, thirty-eight miles, average £7,000 per mile, -	-	-	-	266,000 00 0
From Lebanon to Susquehannah the difficulty will not be so great; thirty-two miles, supposed to cost £6,000 per mile, - - -	-	-	-	192,000 00 0
Total valuation, - - - -	-	-	-	458,000 00 0
Sum provided by law, 1,070 shares, at $400 each,	-	-	-	150,000 00 0
Deficit, and to be provided for, - -	-	-	-	£308,000 00 0

£116,000, a part of the sum deficient, will complete the work from Lebanon to Schuylkill; when that part is finished, the company will draw a considerable annual toll. The citizens of the State will be convinced that, although this great work will be attended with considerable difficulty, it can be surmounted so as to perfect a navigation from the Eastern to the Western waters. For finishing the work from Lebanon to Susquehannah, a further sum of £192,000 is to be provided, making, agreeably to the above estimate, £308,000.

But, as the work from Lebanon to Susquehannah has not yet been laid out by the engineer, £192,000 is mentioned as the greatest sum, supposing no part of the bed of the Quittapahilla and Swatara to be made use of; but if, instead of a canal navigation along the whole margin of the rivers, the beds of the said rivers, wherever they can be made safe and permanent, should be adopted, the expense may possibly be found less. This point will be ascertained during the ensuing summer.

Report of William Weston, Esquire, for the year 1794.

To the President and Managers of the Schuylkill and Susquehannah Navigation Companies.

GENTLEMEN: LEBANON, *December* 16, 1794.

Having received from the Secretary of the Schuylkill and Susquehannah canal the request of the managers for my immediate attendance on the committee who are appointed to state the present situation of their works, and a general statement of their affairs, I have endeavored to supply them with every information which the shortness of the notice would allow. It was my original intention to have postponed my report until the close of the present year; but the commands of the board not permitting me to carry it to that time, I have endeavored to anticipate, as accurately as possible, the probable state of the works at that period. It must be understood that the annexed details and statements relate only to that part of the canal eastward of the summit level, the operations of which commenced early in June; the previous expenses of day-wages, and some subsequent pieces of contract work on the summit, will be included in Mr. Roberdeau's accounts herewith exhibited.

I flatter myself the progress made in the works, in the short space of seven months, will prove satisfactory to the board. On a careful comparison of the actual state of the various works, and an ample allowance for the completion of such parts as remain unfinished, with the previous estimate laid before the board in my last report, it appears that, from the east end of the summit level to Michael Kreitzer's plantation, a distance of more than four miles and a quarter, the actual expenditure will fall far short of the estimated one, at least £3,000. Though I would not wish to appear too sanguine, yet I may be allowed to draw some favorable inferences of the remainder of the line, which, if realised, cannot be more gratifying to the board than pleasing to myself. Independent of this, I have well-founded

reasons for asserting that the works will rather proportionably diminish than increase in expense, as the important object of land carriage will, after the ensuing year, in a great measure, be done away, by the canal being made subservient to that purpose. The sand for the locks, bridges, &c. will be, from the approaching proximity of the canal, delivered at the respective works for little more than half the present cost; the same remark will hold good respecting the lime. Though the average value of the bricks, reduced to statute size, will not exceed twenty-four shillings per thousand, yet I must own I have been disappointed in the quantity made the last season—the unfavorable state of the weather, during the greater part of the summer has prevented the produce coming up to my calculations; at the same time that the number has been diminished, the cost of those actually made has, of consequence, been increased. From the difficulty of procuring wagons to haul bricks, lime, sand, &c., I was under the necessity of not employing half the number of bricklayers I had at first contemplated; though, at the same time, more work has been done in four months than is generally executed on most canals in one season. Five locks of six feet fall, and two road bridges are completed, and such progress made in the sixth lock, and two more bridges, that a fortnight's work, in the ensuing spring, will suffice to finish them. The whole of the works on the canal, excepting such parts as it would have been imprudent to set, have been executed by contract, and on such terms as I doubt not will be satisfactory to the board. As the subsequent statements contain the whole of the expenses incurred on the respective articles to the present period, it is proper to observe that a considerable portion thereof belongs to the next year's account; upwards of a million and a half of bricks, hollow quoins for ten locks, coping for nine bridges, and a considerable quantity of lime, sand, &c. are now on hand, ready for immediate use. The different works are classed separately; the amount of these will not contain the whole expenses of the present year, there being many accounts which could not, with any propriety, be fixed to any article; others that belong not solely to the present year; and others which I have had no opportunity of seeing; but the accounts of Mr. Roberdeau and Mr. Beatty will give the board every information they may desire on this head.

I am, gentlemen, with the greatest respect, your obedient humble servant,

WILLIAM WESTON.

Account of the number of bricks made for the use of the Schuylkill and Susquehannah canal, and the attendant expenses.

	£	s.	d.
Digging of clay, 9,785 cubic yards, at 6*d.*, 7*d.*, and 8*d.* per yard,	294	2	2
Moulding and burning,	1,418	17	9
Tempering and burning,	1,042	12	6
Wheeling and burning,	724	3	5
Off-bearing,	346	6	5
Wood-cutting, 2,388 cords of wood, at 2*s.* 6*d.*, 3*s.*, and 3*s.* 9*d.* per cord,	358	11	10½
Labor of various kinds; emptying kilns, stacking the bricks, &c.	622	00	0
Hauling wood, sand, dust, &c.	391	19	1
	5,198	13	2½

998,699 bricks laid in the locks and bridges.
72,065 bricks laid in the stop-gate, towing path, walls, &c.
1,419,236 bricks in the brick-yard.
106,000 bricks in the sixth lock.
204,000 bricks in kilns, clamps, chimneys, &c.

2,800,000 total, which reduced to statute size, and some deductions made which do not belong to the brick account, will average 24*s.* per thousand.

Bricklaying.

Laying 1,103,052 bricks in the five locks, bridges, &c.					987	19	4

Lime.

Burning 10½ kilns of lime, at £12 12*s.* per kiln,	£134	8	0		
Cutting wood and hauling,	99	5	11		
				233	13	11

7,500 bushels of lime, which is equivalent to 7½*d.* per bushel.

Sand.

Damages of land by digging, unbasing the sand-pit, digging and unloading the sand, and hauling the same to the locks and bridges,				281	16	1
Three hundred and sixty wagon loads have been delivered at the locks and bridges, containing 14,400 bushels, equal to 4½*d.* per bushel.						
				£6,702	2	6½

Cutting the canal from the east end of the summit to Kreitzer's.

Length 4 miles 16½ chains. Amount £8,526 13*s.* 2*d.*, viz:

	Chains.	Links.	£.	s.	d.
Through Loy's plantation,	46	25	876	7	3
Through Spangler's plantation,	20	51	369	11	8
Through Immel's plantation,	22	86	616	17	2
Through M. Rambler's plantation,	23	60	645	12	2
Through L. Rambler's plantation,	16	50	498	6	9
Through T. Bassler's plantation,	39	40	710	7	11
Through Myers's plantation,	41	50	1,353	11	10
Through S. Bassler's plantation,	18	50	522	6	4
Through Miller's plantation,	27	10	931	9	9
Through Kushter's plantation,	19	40	606	00	0
Through Haag's plantation,	30	90	746	9	8
Through Kreitzer's plantation,	30	00	649	13	8
Stone Work.					
	£.	s. d.			
Getting stone at the different quarries for the locks and bridges,	761	7 6			
Hauling stone from the quarries to the canal,	189	15 0			
Working and setting the coping of the bridges, hollow quoins of the locks,	424	15 0			
			1,375	17	6
Wagons.					
Hauling bricks, lime, &c. from May 19th to December 31,	186	4 7			
Feed for the company's horses, overseers' and wagoners' wages,	597	7 6			
			783	12	1
Lock-pits.					
By order, in favor of Samuel Galbraith, for cutting 1st lock-pit,	56	1 3			
By order, in favor of Samuel Galbraith, for cutting 2d lock-pit,	48	17 6			
By order, in favor of Samuel Galbraith, for cutting 3d lock-pit,	48	17 6			
By order, in favor of Samuel Galbraith, for cutting 4th lock-pit,	48	17 6			
By order, in favor of James Rannels, for cutting 5th lock-pit,	137	16 6			
By order, in favor of Samuel Galbraith, for cutting 6th lock-pit,	262	6 3			
By order, in favor of John Fletcher, for cutting 7th lock-pit,	97	17 9			
By order, in favor of John Butler, for cutting 8th lock-pit,	120	00 0			
By order, in favor of Thomas Morris, for cutting 9th lock-pit,	72	7 6			
			993	1	9
Backing the five locks in Michael Loy's wood, to December 31st,	-	-	465	5	0
			£12,134	9	6

A comparative statement of the expense of conveying twenty tons of produce from Middletown, on the Susquehannah, to the city of Philadelphia, by land and water carriage.

Water Carriage.

	miles
Schuylkill and Susquehannah canal, say	70
Schuylkill, from Reading to Norristown,	46
Schuylkill and Delaware canal,	16
	miles, 132

	£.	s.	d.
Toll on 20 tons of produce for 86* miles of canal navigation, at 10 cents per mile,	40	6	3
Hauling 20 tons 132 miles:			
One man, 5 days,	1	5	0
One boy, 5 days,	1	0	0
One horse, 5 days,	1	10	0
Freight or hire of a boat,		18	9
20 tons for	45	00	0

Or £2 5*s.* per ton;
Or 3*s.* 11¼*d.* per barrel of flour;
Or 1*s.* 2¼*d.* per bushel of wheat.

The above produce is conveyed to market by two men and one horse.

Land Carriage.

From Middletown to Philadelphia, - miles, 100

	£	s.	d.
The present price of carriage from Middletown to Philadelphia is 5*s.* 6*d.* per hundred weight, or for 20 tons,	110	0	0

Or £5 10*s.* per ton;
Or 9*s.* 7½*d.* per barrel of flour;
Or 2*s.* 11¼*d.* per bushel of wheat.

The same by land requires 20 men and 80 horses.

An attempt to ascertain the probable trade and consequent tonnage on the Schuylkill and Susquehannah canal, as referred to in the note at the bottom of page 330.

1. Taking the extent of country on an average width of 10 miles on each side of the canal, from Reading to Middletown, the distance being 55 miles by a straight course, we shall have 1,100 square miles, or 704,000 acres; and taking each plantation at 320 acres, we have 2,200 planta-

* Forty-six miles from Reading to Norristown, where the bed of the Schuylkill is to be used as a temporary navigation, being taken from the whole distance of one hundred and thirty-two miles, leaves eighty-six miles, as above, for the canal navigation subject to tolls.

tions. Supposing each plantation to cultivate 40 acres of grain, at 10 bushels per acre, the total produce will amount to 880,000 bushels, which, at 60 pounds per bushel, gives 23,576 tons; and taking the average tonnage at half the length of the canal, or 35 miles, according to its various windings, it amounts to, at one-sixteenth of a dollar per ton per mile, - - £19,351 19 4

2. The produce of the extensive country, bordering on the navigable waters of the Susquehannah and its numerous branches, are, at present, very great; but in a few years, from the natural increase of population, it will be so immense as to exceed the bounds of calculation; at present, we believe it may very safely be estimated at 600,000 bushels, or 16,071 tons, and, as the distance is 70 miles, the tonnage will amount to £1 12 9¾ per ton, - - - 26,366 9 8

3. Back carriage, consisting of salt, groceries, liquors, and various kinds of European and domestic manufactures; this we will estimate at one-fourth of the above, or - - - 11,429 12 3

4. The carriage of lime, timber, for building, coals, fire-wood, iron, stone, bricks, &c., will certainly be very great; but such as to render it impossible to form an accurate idea of the amount; but, taking it at the lowest rate, it may be estimated at one-eighth of the two first articles, - 5,714 16 1¼

£62,862 17 4¼

Exclusive of the above annual income, the stockholders will derive great emolument from the seats for water works, of which there will be many, from the surplus water at the different locks within the grounds purchased for the canal, and without damage to the mills erected on the lands of the adjoining owners. It will also be a peculiar advantage, that, from the situation of these water works, all produce and manufactures, or raw materials, may be loaded or unloaded directly, without the intervention of land carriage, to and from the boats. The waters of the Tulpehocken and Quittapahilla are abundantly copious to supply every demand for any purpose of this kind whatever. The above calculation, at a dividend of 12 per cent. per annum, is equal to a capital of £523,850; but, calculating the most moderate increase of population, the toll will increase, even on this capital, one per cent. per annum, until it amounts to the limitation, in the act of incorporation, and then the toll will be subject to a reduction according to law.

DELAWARE AND SCHUYLKILL CANAL.

This canal is intended to answer the double purpose of forming a capital link in the great chain of western navigation, from the Ohio and Lake Erie to Philadelphia, as well as for an abundant supply of wholesome water to all parts of the city. The canal will connect the navigation of the Schuylkill with the Delaware, and is carried on a level of forty-nine feet above the high water mark of the Delaware, for about sixteen miles to Broad street; and from thence is conducted into the Delaware, above Callowhill street, through six locks, the distance being about one mile. The report of the deputy engineer states, that* one-third of the work is finished, and that contracts are formed and forming for a vigorous prosecution during the present year; and the committee, with confidence, can assert, that a proper attention of the stockholders to the punctual payment of the moneys when called for by the president and managers, will enable the board to draw a toll for part of the distance in the year 1796, and to complete the whole in three or four years. The sum already expended amounts to £52,500.

The following estimate of revenue the stockholders may, with safety, calculate on when the work is completed:

All the produce passing through the upper canal, and supplies returning, must pass through this canal; the estimate of the Susquehannah and Schuylkill canal is fixed at £62,862 for 35 miles; the Delaware and Schuylkill draw the same toll per mile, in proportion to the distance, which will amount to - - - - - - - - - £31,431 0 0

The probable toll, from the produce of the lands bordering on the Schuylkill and waters thereof, not estimated in the above, will at least produce one-half the amount, - - - 15,715 0 0

The canal passing for about five miles through a variety of marble, free-stone, and lime-stone quarries, from which this city is supplied with materials for building and ornament, will, by calculating the number of wagons now employed in transporting those materials to the city, produce at least - - - - - - - - 15,000 0 0

£62,146 0 0

The stock of the company, as already subscribed, amounts to £150,000, which, from the costs of that part of the canal already cut, will be sufficient for the completion of the work necessary for the transportation of produce; the toll of which will amount, agreeably to the foregoing estimate, to £62,000 per annum, making a dividend of upwards of forty-one per cent.; but, agreeably to the charter granted to the company, the toll is to be so reduced every ten years, as not to afford more than a dividend of twenty-five per cent. per annum.

In addition to the £150,000 subscribed, a further sum of about £50,000 will be wanting to complete the watering of the city, on which the stockholders, by law, are allowed a further dividend of ten per cent. per annum. This great object is of such immense consequence to the health of the city, and to the extinguishing of fires, that the citizens of Philadelphia will cheerfully pay, for the use of the water, a sum more than adequate to the payment of the ten per cent. allowed by law.

In addition to the advantages already stated, great revenues may be drawn from the application of the surplus water passing through the canal, which, from Broad street to the Delaware, affords a fall of near fifty feet. Dry docks are, also, contemplated by the law, and will, when the resources of the company become ample, be carried into effect.

* By a rough calculation, which is by no means exaggerated, I find we have blasted with powder, and quarried five millions four hundred and forty-five thousand cubic feet of rock, and have mounded up, between the towing path of the canal and river, a bank with the stone and rubbish, from twenty to twenty-five feet high, from its base in the river. We have made at our brick-yard, last summer, about three hundred thousand bricks.

At the lower end of the canal, in the vicinity of the city, through the distance of two miles and three-quarters, there have been two hundred and fifty thousand cubic yards of earth and gravel, and partly rocks, removed out of the bed of the canal, and ten culverts built and completed.

Respecting the dimensions of this canal, it has been determined:

1st. That the width of the bottom be twenty feet.
2d. That the depth of water be three feet and a half.
3d. That the width of the canal be thirty feet and a half.
4th. That the width of the towing-path be ten feet.
5th. That the towing-path be not less than one foot above the surface of the water in any place.
6th. That the locks be constructed to admit boats of sixty feet in length and nine feet in width.
7th. That the descent of the canal be at the rate of two inches per mile.

N. B. The new river canal, for conducting water to the city of London, has three inches descent per mile; but this has been found more than necessary, and increases the expense of maintaining the banks.

On the petition of the president and managers of the Schuylkill and Susquehannah canal company, the Legislature have been pleased to pass the following supplement:

A SUPPLEMENT to an act, entitled "An act to enable the Governor of this commonwealth to incorporate a company for opening a canal and lock navigation between the rivers Schuylkill and Susquehannah, by the waters of Tulpehocken, Quittapahilla, and Swatara, in the counties of Berks and Dauphin."

SEC. 1. *Be it enacted by the Senate and House of Representatives of the commonwealth of Pennsylvania in General Assembly met, and it is hereby enacted by the authority of the same*, That it shall and may be lawful for the president, managers, and company of the Schuylkill and Susquehannah navigation, when any part of the said canal and lock navigation shall be in use, to demand and receive of and from the persons having the charge of all boats and vessels, rafts of timber, boards, plank or scantling, passing through the said canal and navigation, and the locks thereunto belonging, at the rate of one-sixteenth of a dollar, by the mile, for every ton weight of the burden of said boats and vessels, to be ascertained as provided for in the act to which this is a supplement, and in like manner one-sixteenth of a dollar, by the mile, for every hundred feet, cubic measure, of boards or timber, and the same sum, by the mile for twelve hundred feet, board measure, of boards, plank, or scantling in rafts, and in proportion for rafts of a greater or less size.

SEC. 2. *And be it further enacted by the authority aforesaid*, That it shall and may be lawful, to and for the said president, managers, and company, to open a subscription for such additional number of shares, in such manner, and at such times, as they may judge necessary, to complete the said canal and lock navigation.

SEC. 3. *And be it further enacted by the authority aforesaid*, That it shall and may be lawful, to and for the said president, managers, and company, if they shall think it necessary, and for the interest of the said company, to negotiate and borrow, upon the credit of their capital stock and incorporation, and the tolls and profits of the same, such sum or sums of money, from time to time, as they may be able to procure, and shall deem expedient and necessary for carrying on and completing the said work.

GEORGE LATIMER,
Speaker of the House of Representatives.
WILLIAM BINGHAM,
Speaker of the Senate.

Approved, February 12, 1795.

THOMAS MIFFLIN,
Governor of the Commonwealth of Pennsylvania.

APPENDIX.

In a historical view, according to the order of time, the following papers should have been inserted immediately after page 852 of the preceding pages. As soon as the subscriptions were completed, and the several canal companies organized by an election of president, managers, and other officers, committees were appointed to lay off and level the proposed tracks of the canals, and to report to the boards of managers.

The summit level, or middle ground, between the head waters of Quittapahilla near Lebanon, and those of Tulpehocken, near Myerstown, (a distance of about four miles and a half,) had been examined and levelled, about twenty-five years ago, by a committee appointed by the American Philosophical Society, viz: William Smith, D. D., then provost of the college of Philadelphia, John Lukens, Esquire, surveyor general of the province (now State) of Pennsylvania, and John Sellers, Esquire. The same ground was afterwards examined and levelled, under legislative sanction, by sundry skilful persons, and, among others, by the celebrated philosopher and mechanic, David Rittenhouse, Esquire, L. L. D. his brother Benjamin Rittenhouse, Timothy Matlack, John Adlum, Esquires, and others, all agreeing in the result of their work, respecting the proper track of the canal, for a junction of the Schuylkill and Susquehannah; extending their prospects still further to the great plan now in operation, viz: the junction of the tide waters of Delaware with the Ohio and Western lakes. But the dark and distressing period of the revolution necessarily suspended all improvements of this nature, in every part of America, until the glorious era of the peace and independence of the United States, when they were first resumed in the States of Virginia and Maryland, upon the Potomac, under the auspices of the illustrious Washington, during his short recess from his public labors; next in the State of Pennsylvania, as set forth in the last page of the introduction to these papers; and speedily afterwards, with a noble emulation of public spirit, in most of the other States, according to their natural advantages, as New York, Connecticut, Massachusetts, the Carolinas, &c.

The Company of the Schuylkill and Susquehannah Navigation being (as above mentioned) the first organized in Pennsylvania, a committee, viz: Dr. Smith, and Timothy Matlack, Esquire, were appointed to repair to the summit ground near Lebanon, and finally to re-examine the levels to ascertain the exact route of the canal, the sources and quantity of the waters which could be brought to supply the reservoir on the summit, and the locks at each end; with an account of the lands and waters necessary to be purchased as the great basis of the work. The same committee were also appointed to level and lay out the Conewago canal, and finished their work in July, 1792. A committee was also appointed to lay out and level the Delaware and Schuylkill canal, from Norristown to Philadelphia, viz: Dr. Rittenhouse, Dr. Smith, and Samuel Powel, Esquire. There is a responsibility attached to the companies and their managers, as well concerning their own diligence as that of their committees, which is the only apology for the mention of these appointments. But the president and managers did not think it proper to depend wholly on their own judgment, or the judgment of their committees, in works of such magnitude and immense public consequence. They, therefore, determined to engage one of the ablest engineers that could be

procured from England, to superintend and direct their works; and, in the meanwhile, that there might be no unnecessary delay, they commenced their undertakings at such places, on the three canals, as appeared to them to leave no room for the choice of better ground, or for any error which could materially affect the work; the Schuylkill and Susquehannah canal under the superintendence of Thomas Bull, Esq. the Delaware and Schuylkill canal under Mr. Jonathan Robeson, and the Conewago canal under Mr. James Brindley.

Early in the month of January, 1793, arrived from London William Weston, Esquire, the engineer engaged by the companies; a gentleman who had directed the execution of some of the principal canals in England, whose great abilities, activity, and experience in all the branches of his department, have merited and obtained the perfect confidence and esteem of the managers; and whose advice and assistance, which have been solicited and given as occasion might permit, will be of the utmost importance towards facilitating the improvements of a similar nature in the neighboring States.

After some necessary arrangements with the president and managers of the several canals, Mr. Weston, accompanied by one of the committee who had assisted in laying them out, left Philadelphia February 1st, and proceeded to that part of the canal begun at Norristown, arriving at Lebanon, February 4th. He found more than six hundred men at work, viz: upwards of two hundred at Norristown, and about four hundred at the summit or middle ground between Lebanon and Myerstown. The following abstract of his report made to the companies on his return, gave them great satisfaction, viz:

"From such a view as the time and the season of the year would permit me to take of the canal through the middle ground near Lebanon, I have little doubt but the most favorable line has been adopted.

"The first and most important object is a due and adequate supply of water. I judged it expedient to examine the various springs which are to supply the summit of the canal, but not with intention to ascertain the quantity they afford (this being an improper season for that purpose) but to view their situation with respect to the summit level. It is very apparent that they may be conducted into the canal with great ease. The springs were lower than when gauged last summer. It will be needless to say any thing further on this subject, as Dr. Smith will deliver to the committee a calculation of the number of lock fulls of water they yield in twenty-four hours; which seems to have been made with great care and attention. This, I apprehend, will be adequate to the trade which may reasonably be supposed to pass over the summit, making proper allowance for exhalation and leakage. Suppose the crown level 3½ miles in length, the extra depth 4 feet, the mean width 32 feet, it will contain 2,365,440 cubic feet of water, which, at 3,420 cubic feet to a lock, will give 691 locks full.

"The Delaware and Schuylkill canal appears to be judiciously laid out, by keeping as near the banks of the river as the nature of the ground will admit.

"The fault of this canal, supposing the dimensions perfectly right, as formed by persons intimately acquainted with the state of the waters, and the boats navigable on them, I observe to be this, viz: that the proposed depth of water being three and a half feet, the width at bottom twenty feet, the surface, with the proper slope, should have been thirty and a half feet, whereas I found it but twenty-seven, the angle of the slope being forty-five degrees; whereas the present practice is an angle of thirty-three and a half degrees, and the bottom and top as two to three.

"The result of a conference with Dr. Rittenhouse, respecting the fall it may be necessary to give the canal, in order to supply the city with water, will be explained to the board by Dr. Smith, together with other matters necessary to be known, but which do not come immediately in my department.

"WILLIAM WESTON."

An abstract of the report of Dr. Smith, respecting the Schuylkill and Susquehannah canal, so far as above referred to by Mr. Weston.

On Tuesday, February 5, 1793, I accompanied Mr. Weston from the main body of the canal, where the workmen were employed, to view the several springs and waters at their sources and heights, from whence they are proposed to be conducted to the canal at the summit level, and where they had been gauged by Mr. Matlack and myself, as a committee of the company, in July last.

Mr. Weston, in his report, has stated to the board the reasons of our not considering it necessary to make any new estimate of the quantity of those waters, and his present idea of their competency to a full supply of the locks "adequate to the trade that may be reasonably supposed to pass over the summit, making the proper allowance for exhalation, oozing, and leakage." He has examined the calculations, and having given them his sanction, as appearing to have been made with care and accuracy, I now report them to be entered among the proceedings of the board, as materials for the engineer to proceed upon, and to be examined in other states of the water.

Estimate of the waters and springs to supply the locks of the grand canal between the waters of the Tulpehocken and Quittapahilla, at the rate of 3,420 cubic feet, to be expended in passing a set of locks.

EAST END.

I.

Kantner's mill stream.

Breadth. Depth. Length in inches. Cub. inches. Cub. feet. Time. Cub. ft. pr. day. Locks per day.

$48 \times 3.96 \times 396 = 75271.68 = 43.61 =$ in $17'' = \frac{221641.44}{3420} = 64.5$, or one lock full in about 22 minutes.

II.

Breckhill's spring and waters, measured at the road a little below the spring house.

Breadth. Depth. Length. Cub. inches. Cub. feet. Cub. ft. pr. day. Locks per day.

$43 \times 5.41 \times 396 = 92121.48 = 53.31$ in $1' = \frac{76766.4}{3420} = 22.4$, or about one lock in 1 hour 4 min.

III.

Baylor's spring, measured at the road below his meadows, two-thirds of the water which issues from the great spring, near his house, being then spread over the meadows or flowing in the water courses.

Breadth. Depth. Length. Cub. inches. Cub. feet. Cub. ft. pr. day. Locks.

$24 \times 3.1 \times 396 = 29462.4 = 17.65$ in $73'' = \frac{20179.74}{3420} = 5.9$; but if taken at the spring head, and conducted in pipes or a trunk, without wasting, would yield + 11.8 locks, or 17.7 locks per day.

WEST END.

I.

Punch spring, measured by making a dam at the spring head.

Breadth. Depth. Length. Cub. inches. Cub. feet. Cub. ft. pr. day. Locks.
$141.6 \times 5.38 \times 396 = 301675.968 = 174.563$ in 8′ $= \frac{31421.34}{3420} = 9.33$ per day.

Ditto, measured lower down, in the natural channel, without a dam.

Breadth. Depth. Length. Cub. inches. Cub. feet. Cub. ft. pr. day. Locks.
$36.07 \times 1.5 \times 240 = 12985.2 = 7.514$ in 17″ $= \frac{38188.8}{3420} = 11.16$ per day.

N. B. The measurement where the dam was first made being the lowest, it is probable that the water had not risen to flow over the dam at its full height, or to the same height which it had when the water was measured below.

The mean of both will give $\left\{ \begin{matrix} 9.33 \\ 11.16 \end{matrix} \right\}$ 10.5 locks.

II.

Upper Punch spring.

Breadth. Depth. Length. Cub. inches. Cub. feet. Cub. ft. pr. day. Locks.
$24 \times 1.73 \times 396 = 16441.92 = 9.55$ in 70″ $= \frac{10787.333}{3420} = 3.154$ per day.

III.

Martin Light's brook, or run, to be united with the two Punch springs, and carried, on the level of the Lower Punch spring, to the reservoir; measured at a deep and wide place below a ford.

Breadth. Depth. Length. Cub. inches. Cub. feet. Cub. ft. pr. day. Locks.
$89.06 \times 6.9 \times 360 = 221545.656 = 128.2$ in 4′ 15″ $= \frac{43436.4}{3420} = 12.7$ per day.

Ditto, measured at a shallow and narrow place, with greater velocity.

Breadth. Depth. Length. Cub. inches. Cub. feet. Cub. ft. pr. day. Locks.
$76.44 \times 2.64 \times 360 = 72648.576 = 42.042$ in 1′ 32″ or 92″ $= \frac{39482.92}{3420} = 11.545$ per day.

Mean locks per day, 12.122.

The amount of the whole is upwards of one hundred and thirty locks per day, which will ascend and descend seventy-five boats of from seven to ten tons each.

"At the season of the year in which these springs and waters were gauged, the weather was extremely warm, the evaporation great, and many of them gauged after having passed over large meadows. I have, therefore, no hesitation in declaring that the quantity given may be safely taken as rather under than above the mean quantity, at the driest and warmest times of the year; and I trust this will be verified by Mr. Weston's future examinations; and if any deficiency should, upon an increased state of the trade, be found in the quantity of those waters, it may be supplied, as I hinted in a former report, by the introduction of Furnace creek, and even the Swatara and some of its branches; and the increased trade will enable the company to make use of all these auxiliary supplies when necessary. But, without these, Mr. Weston's abilities, even with the present waters, will introduce constructions in the locks, at a small expense, whereby one-third of the quantity of water in each lock may be saved, exclusive of the reservoir on the summit level, which may be constructed, according to his report, to contain six hundred and ninety-one locks full of water, to be accumulated by occasional rains at all seasons of the year, and by the natural supply of the springs on such days, as the number of boats passing the locks may be short of the number calculated upon, which will probably be the case for a long time to come.

"WILLIAM SMITH."

"February 19, 1793."

RECAPITULATION.

More than two years have elapsed since the engineer delivered his first report, approving the general plan of the works, as projected by the companies, and in considerable progress before his arrival. His experience and labors during that period have fully justified the accuracy of the calculations, and the easy practicability of all the projections. Upwards of fifteen miles, including the work on both canals, commenced before his arrival, are in general nearly completed or finished, with the necessary locks, and through the most difficult grounds; a distance of more than four miles and a quarter of which were finished in about seven months of last summer and autumn; the actual expenditure of which fell short of the estimated one at least £3,000; yielding a favorable presumption, that, in the progress of the works, the expense will rather be proportionably diminished than increased. [See his reports for 1793 and 1794, particularly the latter, page 856 of the preceding papers.]

Upon the whole, it appears demonstrably evident, that this grand canal navigation (through a course of seventy miles distance, joining the Schuylkill, at the mouth of Tulpehocken, with Susquehannah, at the mouth of Swatara, whereby the carrying trade between Philadelphia and the western waters of the Ohio and great lakes, will be commenced and proceed in operation) may be completed, on a secure and permanent foundation, for the sum of - - - - - - - - - £450,000

But by the lowest calculation of the trade which may, at present, be expected through this distance of seventy miles, (without estimating its immense future increase by the increase of population, through an extent of country of more than two hundred miles square, whose waters will communicate with this canal,) it would yield a dividend of 12 per cent. per annum to the stockholders, which is equal (see page 859) to a capital of - - - - 523,850

So that there would be a present surplus of a toll of 12 per cent., (increasing annually,) equal to a capital of £73,850, beyond the capital necessary for completing the work.

This surplus, with a dividend of 12 per cent. yearly increasing, (setting aside for a moment the incitements of public spirit,) is certainly more than sufficient to incite the most active perseverance in the great undertaking, and every effort of the company to increase their capital to the amount, which, as stated above, is - - - - - - 450,000

Of this sum the subscriptions of the stockholders, according to the original act of incorporation, amount to - - - - - - - - 150,000

Deficient about - £300,000

There are but two ways of supplying this deficiency, as was stated in a memorial to the Legislature, (see page 853,) viz:

1st. Either by enlarging the present capital by the increase of shares and new subscriptions, on the terms of the act of incorporation; or,

2d. By the company's negotiating and obtaining an effectual loan; or, perhaps, partly in both these methods.

But by reason of the large sums of money already invested in the various stocks of this State, and of the United States, such as banks, insurance companies, roads, canal and other companies, and the growing demands of capital for our increased domestic and foreign trade among our moneyed citizens, there appears but little prospect either of obtaining a loan or an increase of shares to any considerable amount among individual capitalists in this country, nor a prompt payment of a considerable number of the shares already subscribed according to law.

And although it might be possible, and perhaps probable, in the present state of property among capitalists in Europe, to obtain a foreign loan, upon the ample prospects which the magnitude of this undertaking holds forth, of a speedy and secure return either of the capital or liberal profits on the footing of stockholders, yet the length of time and expense attending the negotiation, would give a damp to the work, and occasion such a stop or suspension of it as would be dishonorable to the State, and fatal in the issue; considered not only as a check to our Western population, but a grievous prolongation of the time in which the present stockholders might expect some returns for their money advanced, not to mention the bad policy of vesting such a large proportion as two-thirds of the stock and profits of so great an undertaking in the hands of foreigners; although one-third might be prudently vested in this way, while the State might hold the other third.

This distribution of the capital into three parts, the commonwealth and original stockholders being invested with two, would undoubtedly secure the raising of the other third part, upon an advantageous loan or new subscriptions for shares either at home or abroad, and thereby likewise insure the speedy and complete success of the work.

The finances of the State are in a flourishing condition, and it is submitted to the wisdom and feelings of an enlightened Legislature, to what nobler purposes they can be applied (in part at least) than to the improvement of our country, and the encouragement of arts and manufactures, even if no moneyed return were to be expected on the capital to be expended; for, can an interest of 8 or 10 per cent. on the moneyed capital of a great commonwealth be considered as an equivalent for suffering the improvements of a happy and fertile country to languish and decay? But when it is considered that, even in a moneyed view, the stock to be vested in the shares of this canal will produce a larger and more growing interest or dividend than can be contemplated on any other species of stock, besides the additional interest, in point of revenue, from an increase of population and of the wealth of our citizens, it is hoped the Legislature, "who have already put their hands to the plough (by the liberal benefactions and grants which are stated below) will not look back," nor suffer their former liberality to be lost to the public by any abatement of their protection and encouragement.

Grants of public money for the improvement of roads and waters by the Legislature of Pennsylvania.

Appropriation of £5,000 (part of £10,000 appropriated by a former act for claims and improvements) yearly.

A sum, not exceeding £2,500, shall be expended and laid out, under the direction of council, for clearing and making navigable certain parts of the river Susquehannah above Wright's ferry and the Juniata, and their waters, &c., viz:

£1,000 for clearing and making navigable the Schuylkill, and its waters.

£1,500 for clearing and making navigable the Delaware, Lehigh, and their waters.

RIVERS.—*Appropriations, April* 13, 1791.

For the river Delaware, - - - -	£3,500
For the river Lachawaxen, - - - - -	250
For the river Lehigh, - - - - - -	1,000
For the river Schuylkill, - - - - -	2,500
For the river Susquehannah, from Wright's ferry to the mouth of Swatara creek, inclusive,	5,250
From the mouth of Swatara to the mouth of Juniata, - - -	300
From the mouth of Juniata to the mouth of the west branch - - -	300
From the mouth of the west branch to Starucca, at the great bend, - -	440
For the west branch of Susquehannah, from the mouth thereof to the Sinnamahoning, -	160
For the Sinnamahoning to its north branch, - - - -	200
For the north branch of the Sinnamahoning, as far as the place called Driftwood, -	300
For the river Allegany from the place where the road from Driftwood will strike the same, down to the mouth of Conewango creek, - - - - -	150
For French creek, from its mouth to the portage leading to Presque Ile, on Lake Erie, -	400
For the river Juniata, from the mouth to Water street, - - -	820
From Water street to Frankstown, - - - - -	1,500
For the Conemaugh, from Stony point to Richard's run, - - -	400
From Richard's run through Chesnut ridge, - - - -	2,000
From Chesnut ridge to Loyal Hanning, - - - -	400
For the river Kiskeminetas to the second falls inclusive, - - -	250
From the said falls to the river Allegany, - - - -	100

ROADS.—*April* 13, 1791.

From Stockport, on the river Delaware, to Harmony, on the river Susquehannah,	£400
From Driftwood, on the Sinnamahoning, to the river Allegany,	460
From French creek to Presque Isle, on Lake Erie,	400
Through the Canoe Narrows, and from Daniel Titus's to Poplar run,	300
From Poplar run to Conemaugh,	360
From the forks of Little Conemaugh to the mouth of Stony creek,	180
For a road from the town of Wilkesbarre to the Wind gap,	500
From Harrisburg, through the narrows, at the end of Kittatiny mountain and Peter's mountain, and from thence the nearest (and best course to the place where it will intersect) to the road leading from Harrisburg to Sunbury, at or near Halifax,	600
From Frankstown to Pittsburg,	300
From Bedford to Pittsburg,	500
From Reading to Sunbury,	300
From Bedford to the west side of Laurel hill,	400
From the mouth of Juniata to David Miller's, on the Juniata, through Dick's gap,	300
Through the Long Narrows,	180
Through Jack's and Igow's narrows, on the Juniata,	120
From near Catawessy, on the north branch of the Susquehannah, to Hamburg, on the river Schuylkill,	300
From Yorktown to Cooper's ferry, (to be applied between Muddy creek and said ferry,)	100
From Fulton's ferry, on the Susquehannah, towards Newport,	300
From Callender's mill over Croghan's gap, in the Blue mountain, to West's mill,	200
Through the upper part of Berk's county down to Schuylkill	300
From Keplinger's mill, on Little Schuylkill, to the Susquehannah,	300
Through Nicholls's gap over the South mountain,	250
From Middle creek to Grubb's furnace,	200
Through Black's gap over the South mountain,	100
From Buchanan's, on the east side of the South mountain, and through the Great cove, to the foot of Sideling hill,	200
From Fort Penn, on the east side of the northwest branch of Broadhead's creek, to Wallenpaupeck, near the great falls, and from thence by or near the Indian orchard, between the river Delaware and Shohocking creek, to the river Susquehannah,	400

APRIL 10, 1792.

The moneys appropriated by the act of April 13, 1791, for opening the road from Poplar run to Conemaugh, and from Little Conemaugh to the mouth of Stony creek, and also from Frankstown to Pittsburgh, are resumed and applied as follows, viz:

From Frankstown on Juniata, to Conemaugh, at or near Stony creek, a sum of	£530
And the remainder from Conemaugh, at or near the mouth of Stony creek, to the west side of the Chesnut ridge, at or near Thomas Trimble's,	310
From Bedford to Pittsburgh, to be laid and applied to that part of the road between the east side of the Allegany mountain, and the west side of Laurel hill,	800
From the east side of Sideling hill to the town of Bedford,	150
From Lehigh Water Gap across the Matchunk mountain to intersect the Nescopeck road made by Evan Owen,	200
Through Shippensburgh Gap over the south mountain leading towards Yorktown,	200
Through McAllister's Gap to the Burnt Cabins,	300
From Hughes's encampment, at the foot of the Dry ridge across the Allegany mountain,	200
From Cherry's mill, on Jacob's creek, across the Chesnut ridge, thence to the top of Laurel hill, &c.	200
From the west end of High street, of the city of Philadelphia, through Blockley to the line of the county of Delaware,	300
For Vandering's hill, Roxbury township,	300
From Lancaster to Harrisburg, beginning at the Bear,	500
From Shippensburgh to Bedford, over the three mountains,	200
From Mount Rock, near Carlisle, to Rankin's Ferry, on Susquehannah,	150
Across the Blue mountain at Smith's Gap, between the Wind Gap and the Lehigh Water Gap,	200
From Peter's mountain, on the east side of Susquehannah, to Sunbury, (in addition)	150
From Wilkesbarre, or Wyalusing, or Mushoppen creek, and to intersect Ellicott's road at or near Tioga point,	100
From Loyalsock creek to the Tawanisco branch of Tioga, &c.	100
From Stockport, on Delaware, to Susquehannah, near Mushoppen creek,	100

RIVERS.—*April* 10, 1792.

Monongahela, from the mouth thereof to the Virginia line,	1,200
Youghiogeny, from its mouth to the mouth of Saltlick creek,	1,200
Juniata Raystown branch, from the mouth thereof to Magaughey's mill, about three miles above Bedford, and Dunning's creek, from the mouth thereof to the Big Fork,	600
Total,	£36,160

NOTE.—These three sums, amounting to £3,000, are taken from the sum of £4,000 by the former act appropriated towards improving the navigation of the Little Conemaugh; but the faith of the State is pledged to make good the said sum of £3,000 whenever the Governor shall be of opinion that the navigation of the Kiskeminetas and Conemaugh shall be so far improved as to render the navigation of Little Conemaugh a necessary link in the chain of water and land communication between the eastern and western waters of the State.

ROADS.—*April* 11, 1793.

From Philadelphia to Yorktown, through West Chester,	$400
From McCall's ferry, on Susquehannah, to the line of the Delaware State, by the way of the cross roads,	300
From Prather's, on the top of Allegany mountain in Bedford county, through Berlin, to the west side of the Chesnut ridge,	300
From Spiker's, at the foot of the Allegany, to Cherry's mill, on Jacob's creek,	200
From Reading to Presque Isle,	1,333
From Strasburg, in Lancaster county, to the line of the State of Delaware towards Newport,	300
From the west end of High street, Philadelphia, through Philadelphia county to the line of Delaware county,	200
From Perkioming to the Swamp meeting-house,	200
From Tohiccon to the Springfield meeting-house,	200
From Brackenridge's to the Northampton county line,	80
For a bridge over Perkioming creek,	2,300
For a bridge over Clark's creek and Powel's creek, and for a road over Peter's mountain from Ayre's farm to McCall's tavern,	720
Road over Black's Gap, and a bridge over Conegocheague creek,	300
Bridges over Conegocheague creek and Conedogwinet creeks on the State road from Shippensburg to Bedford,	300
From Burnt Cabins to the east side Sideling hills,	200
From Philadelphia to Sunbury (improving and completing) from the Broad mountain to Titeworth's tavern,	800
Over Trent's Gap in Cumberland and York counties,	300
From Carlisle to Sherman's Valley, to cross the north mountain near Hurley's Gap,	300
From Buffalo hill, in Greenwood township, to the mouth of Wild Colt run,	200
From Spiker's to Cherry's mill,	300
From the top of Winding ridge, on the Maryland line, to the west side of Laurel hill, near Uniontown,	500
From near the line dividing the counties of Lancaster and Chester, on the north side of the Welch mountain in the Paxton road, and from thence to the road leading from Philadelphia to the borough of York,	400
From McCall's or Newberry's ferry, on Susquehannah, to intersect the road leading from Yorktown to Peach Bottom ferry,	200
From Bedford to Pittsburgh,	500
From Frankstown to Pittsburgh,	500
From Wilkesbarre to Wyalusing,	700
From Fort Penn to the portage between Delaware river and Shohoking creek (in addition)	400
From Lehigh Water Gap across the Matchunk mountain, to intersect the Nescopeck road (in addition)	400
From George Brown's, through the Little Gap of the Blue mountain,	200
Between Lewistown, in Mifflin county, and Huntingdon town,	400
From Lewistown to Penn's Valley,	400
From Peach Bottom ferry, on Susquehannah, to the Maryland line towards Christiana,	500
Total,	$14,333

£200 appropriated by a former law towards opening and improving a road from Cherry's mill to the top of Laurel hill, applied towards opening and improving the road from Spiker's to Cherry's mill.

C. c. 5.

NEWBERN AND BEAUFORT CANAL.

SIR: CUSTOM HOUSE, BEAUFORT, *October* 9, 1807.

I have received your letter of the 28th July, enclosing a copy of a resolution of the Senate of the United States, respecting roads and canals.

There is not at present, within my knowledge, any company for carrying on canals or turnpike roads, existing in this State.

About the year 1795 the Legislature of this State passed a law to authorize the cutting a canal to connect the waters of Nuis and Newport rivers, and thereby to form a safe and convenient communication between Newbern and Beaufort, which, if it had been effected, would have been of great utility, particularly to Beaufort.

Shortly after the passing of said act, commissioners were appointed, and a survey had on the route through which the canal was to pass. The distance was found to be short of three miles, the ground low and very level, not more, I think, than six or eight feet on an average above the level of the waters to be connected.

A plan was then drawn up, and the cost of the work estimated at $10,000, which was divided into one hundred shares of $100 each, to be paid in four different instalments.

The shares were sold out immediately, and directors appointed to carry the plan into execution, who contracted with a William McClure, of Newbern, to have the work completed in eighteen months from the date of the contract; but he, (McClure,) supposing the sum to be insufficient, applied to the General Assembly, who allowed him eleven shares in addition to the former, notwithstanding the work was not completed within the time limited; and, to avoid a prosecution, the said contractor fell on a plan of buying in all the shares, and thereby got the business entirely in his own hands, but he, dying shortly afterwards, the matter was discontinued.

Considerable work has been done on the premises, but in such a manner as to be of no great use, even though the canal should be undertaken again.

I have also understood that another canal has been undertaken some years since, to connect some of the waters in this State with some of those in Virginia; but of that I have no particular knowledge.

Enclosed is my weekly return, No. 222.

I have the honor to be, very respectfully, sir, your obedient servant,

BRIAN HELLEN, *Collector.*

Hon. ALBERT GALLATIN, Esq.

CAPE FEAR RIVER.

DEAR SIR: HOUSE OF REPRESENTATIVES, *March* 20, 1808.

To the queries you have been pleased to address to me on the subject of ———, in North Carolina, I can make you but a general reply. Our Assembly has passed a number of laws, and incorporated various companies to improve and extend the navigation of our rivers. In some instances, with a view to connect different water courses within the State, and in other instances to effect a like object with streams out of the State; but I believe little, as yet, if any thing at all, has been done with complete effect.

Of this little, my information is principally confined to what has been done on Cape Fear, Deep and Haw rivers. To extend the navigation of these, a company was incorporated, with the usual privileges, in the year 1796. Their stock in shares was not to exceed $8,000, which, with their town lots and other canal property, raised the estimate of their entire funds to a sum not less, nor considerably over, $12,000. At the outset some spirit attended the business. The shares were soon sold, land bought, and a town laid off in the county of Chatham, a little above the confluence of Deep and Haw rivers, extending from river to river. To this the name of Haywood was given, and no sooner was the lots exposed to sale, than sold; buildings and stores established, and a number of families introduced, all in the most unshaken confidence; they were soon to have both town and commerce.

In the mean time the company had adopted the plan of a sluice navigation, and they pursued it till much time, and a considerable portion of their active capital were consumed, and when supposed to be completed, attempts were made to descend with loaded boats; but, in two cases out of three, both failure and disaster took place. Thus, then, with abated zeal and diminished funds, they had, of necessity, to resort to the true system, *that of canals and locks.* In one season they accomplished a short but difficult canal, (difficult from a body of solid rock that lay in the way,) and established a lock, which was found to answer, and to give a safe passage by what is called the Brick House or Great falls, about seven miles below the new town.

Smilie's falls, something below these, which, though larger, were not so rapid, then presented the principal remaining difficulty to be encountered, and would require a canal six miles long, and two locks to effect a passage of convenience and safety. The digging was found easy, and I am told nearly half the distance has been accomplished; but, from the exhausted state of the funds, the work has been suspended for now two years or more. In this state, therefore, the business remains, except that our last Assembly has increased the amount of the original stock, and we may now presume the company are about to recommence their labors.

I am, sir, with assurance, &c.,

R. STANFORD.

TURNPIKE ROADS OF MASSACHUSETTS.

SIR: BRIDGEWATER, *December* 10, 1807.

I received your communication of the 13th of August, last, accompanied with certain queries respecting canals and artificial roads, in pursuance of a resolution of the Senate of the United States, and requesting my aid in both or either of those objects. Not having any thing important to communicate on either, I have forborne to answer your letter longer than I ought to have done, considering the great honor you have done me in supposing I could have more information on these subjects than yourself. With respect to the first object, canals, the general court of this State, having already appointed a committee to explore this part of the country, where, if I have any knowledge on this head, and might be supposed to have the most, I must refer you to their report when made, for better information than I can possibly give. As to the second object, artificial roads, I have no particular informa tion to communicate, excepting in the turnpike from Weymouth landing to the great ponds in Middleborough, called, in the act of incorporation, *New Bedford and Bridgewater Turnpike*, in which I have had, perhaps, the principal concern, and which is now completed. And even in this, your own knowledge is sufficient to make any information from me unnecessary. I will, however, state that it is about twenty-five miles long; that there are but a very few hills, and that four degrees ascent is the greatest that has been allowed; it is twenty-four feet wide in the travelling part. There are no large bridges. It cost about $1,600 a mile, including the bridges. The road, exclusive of the bridges, cost about $900 a mile; for the rates of toll, I must refer you to the act of incorporation. I suppose, however, this information is not of the nature required by the resolution of the Senate, which appears to have in view such objects only as may require the aid of Congress.

With much respect, I am, sir, your friend and obedient servant,

SILVANUS LAZELL.

DEAR SIR: WEYMOUTH, *August* 29, 1807.

Having been absent from home on a journey, your favor of the 13th instant did not reach me until the 25th. The enclosure contains sundry questions respecting canals and turnpike roads; with respect to the former, my knowledge is very imperfect; our friend, Col. Baldwin, will give you every necessary information on the subject. With respect to the latter, viz: turnpike roads, such knowledge as I am possessed of, I shall cheerfully communicate, requesting the liberty of making such observations as occur to my mind, without being restricted to the order of the questions proposed by the Secretary of the Treasury of the United States.

The turnpike roads in this State have been made upon the principle of opening a shorter course to the metropolis, or to some capital seaport town, or to some one of the neighboring States, in as direct a line as the nature of the ground would admit. These have uniformly been undertaken by individuals, who have associated together for the purpose, petitioned to the general court for leave to build the road proposed, as surveyed and described. Having obtained an act of incorporation, and become duly organized, they determine the numbers of shares to be held in the turnpike, and the mode of executing the business. The powers, duties, and privileges of the corporation, are described in the incorporation act.

The corporation is vested with the power of making the road as described in the act; to agree with the owners of land through which it passes; if they cannot agree upon the price, application is to be made to the court of the general sessions of peace, for the county in which the land lies, for a committee to view the premises, and make an appraisement and report, which report, if accepted by the court, generally settles the dispute; but if the holder of the land is dissatisfied, he may, within a time limited, apply to the same court for a jury, whose verdict is final. The corporation is allowed to erect toll-gates at certain distances, at which they may demand such toll as they are authorized by law to receive from all travellers on horses, for carriages of all kinds, carts, wagons, &c. A rate-board, descriptive of the legal toll of each article, is to be kept at each toll-house, placed in a conspicuous view; if

a greater toll is demanded and received, the receiver is subject to a penalty. The corporation is liable to damages if the board is not kept in repair, and all who injure the road or toll-gates, subject to a penalty. Such as travel on the Sabbath, to public worship, are exempted from toll; also, the farmer through whose land the road passes, and all persons passing on military duty.

Shares are considered as personal estate; those of delinquent proprietors may be sold.

A limited time is given for completing the road, and, when completed, must be viewed by such committee as is appointed by the act for that purpose, and, if approved, the corporation will commence their toll; but, previous to receiving of toll, are required to exhibit to the Governor and Council a statement of the whole expense of the road, and annually, an account of the income or dividend arising from the toll, with their necessary annual disbursements.

The general court reserves to itself the right of dissolving the corporation, whenever it shall appear that it has been fully compensated for the moneys expended in purchasing, repairs, &c., with an interest of 12 per cent. per annum; it is then to be vested in the commonwealth, and be at their disposal.

Each proprietor has a right to as many votes in corporation meetings, as he holds shares, provided they do not exceed the number of ten; but is entitled to no more.

Having given the outlines of the charters or acts of incorporation, which may serve, in some measure, as an answer to query 9th, I will now proceed to—

Query 2d.—Elevation of hills.

Answer. The greatest angle of ascent not exceeding five degrees.

Query 3d.—Breadth, form, materials, &c.

Answer. Breadth not exceeding four, nor less than three, rods; the foot-path 24 feet, crowning with an elevation in the middle, of 18 inches from its sides; the materials are according to the nature or bed of ground on which the road is to be made; if it is morassy, or a meadow, it must be covered with brush, poles, or plank, ditches dug on each side, and thrown over them, then covered with clay, if at hand, or earth, and last of all, well gravelled. If there is any outlet for the water, it should be drained off, and in particular places, through the whole, where necessary, sluice-ways, or small bridges, should be carried across the road.

If the land, over which the turnpike road is to be made, is loose and sandy, some body of a more adhesive nature must be added to it, such as clay, compact earth, and, in some cases, poles or stone. If the ground is a light or heavy loam, it will require much gravelling, but a very compact earth, whose parts adhere closely together, less gravelling. Where the ground is stony, the large stones must be removed, and none appear above the surface. The ground is generally ploughed before forming the road.

Query 5th.—Particular obstructions and difficulties surmounted, or to be surmounted.

Answer. Deep meadows, hills, and ledges, or bodies of rock. In some instances they are insurmountable, and make it necessary to take a different or more circuitous course, to avoid them; the instances, however, are but few, where resolution, patience, and perseverance will not surmount them.

The 6th, 7th, and 8th queries, must be answered generally, as I know not any particular data, by which to determine, in detail, the expenses per mile, or the rate or gross amount of toll, &c. The expense will be in proportion to the price of the land, and the labor and difficulty of making the road; the amount of toll in proportion to the travelling. Turnpike roads in this State have generally been made by contract; the contractors have rarely, or ever, kept an account of their work in detail. The business is attended with such a variety of circumstances, that it is very difficult to form any exact standard. Some of the roads have cost $3,000 per mile, others $5,000, and so on, to $15,000. Newburyport turnpike road, I suppose to be 32 miles in length; it has cost more than $400,000, and yields but little profit, perhaps not exceeding 2 per cent. per annum; the difficulties surmounted were hills, rocks, meadows, and sunken land. Neponset turnpike is said to yield 8 per cent.; Salem, 6 per cent.; and it may be affirmed, with truth, upon the best information I can obtain, that all the other turnpikes in the State will not, upon an average, yield much more than 3 per cent. per annum, net income.

Query 4th.—Respecting bridges.

Answer. Bridges in this State are generally constructed of wood, with stone abutments, 24 feet in width, or wider, if necessary, for foot-passengers to pass on each side, with good strong railings. The timber must be sound and durable; the posts of the bridge, which are generally white oak, must be drove singly with heavy weights, sufficient to enter them far enough into the ground; this is done, for the greater part, by machinery. The bridge is covered with 3 inch plank, and made a little crowning. To bridges on navigable rivers, a draw is required, which should be so constructed as to be raised with the greatest ease. Some few of the wooden bridges have been constructed with arches, upon geometrical principles; in like manner, they may be made of stone.

Having, in some measure, answered the several queries, and having written under the operation of the prevailing cold, which has unfitted me, in a degree, either for bodily or mental exercise, I am constrained to forward it to you in its uncopied state, with all its errors and imperfections. Should it, however, in any measure, answer the end proposed, it will be highly gratifying to him who subscribes himself,

With great esteem and respect, your friend and humble servant,

COTTON TUFTS.

Hon. BENJAMIN LINCOLN, Esq.

D.

TURNPIKE ROADS OF RHODE ISLAND.

SIR: COLLECTOR'S OFFICE, PORT OF NEWPORT, *September* 29, 1807.

On the 5th of August I received your letter of the 28th of July, with its enclosure, relative to canals and roads, with a desire that I would collect, and communicate to you, such information as could be obtained respecting undertakings of that nature which may have been completed, commenced, or projected, in the State of Rhode Island; and, in the postscript, you say: "This communication is made to you principally in order to obtain information respecting the practicability of uniting the bay of Rhode Island with that of Massachusetts, either by Taunton or Providence river, or any other route."

Finding that the collector of Providence has received a similar communication from you, excepting what is contained in said postscript, and that he could more easily obtain correct information concerning turnpike roads than I could, (no canals are formed or contemplated in this State,) my attention has been principally drawn to the subject of the postscript. I have, indeed, made some inquiry concerning the turnpikes projected in this district, and am informed that a turnpike road has been projected and surveyed, which begins on the post road nearly opposite to the road leading to Wickford, and runs nearly a west course by the Beach pond until it reaches the Connecticut line. The distance from Connecticut to the post road is a few rods more than nineteen miles. There

are but few remarkable hills in this route, and their elevation has not been ascertained. The sum necessary to complete this road will be about twenty or twenty-five thousand dollars. The capital stock of the Wickford turnpike company is to be divided into shares of not more than fifty dollars each; but the shares have not yet been subscribed for, nor hath the charter yet passed both branches of the Legislature. The surveyor for North Kingstown, from whom I have received this information, is doubtful whether the plan will ever be carried into execution; but, should it be executed, he believes great benefit would be derived from it.

The surveyor for East Greenwich has given me the following account: The Legislature of this State, in February, 1803, granted a charter to sundry persons to make a turnpike road from East Greenwich to Connecticut line, thirteen thousand dollars having been subscribed. The distance from the compact part of East Greenwich to the turnpike leading from Providence to Norwich, in Connecticut, is twenty-four miles; probable cost, $1,000 per mile. As the whole money necessary to finish the road is not yet subscribed, nothing has yet been done; as soon as that is effected the work will commence.

Hills to ascend on a western course from East Greenwich until it strikes the turnpike road from Providence to Norwich, in Connecticut.—Andrew's hill; rise about 20 degrees; can be straightened so that the rise will not exceed 18 degrees; length about 100 rods. No other hills of any considerable ascent until we get to Racoon hill, which we must ascend; rise about 30 degrees; can be reduced a little; length about 120 rods from bottom to top. No other hill of any considerable rise on the western route; but on our return we have the Weaver hill, so called, to ascend; length about 80 rods, and about the same ascent as Racoon hill; but can be much altered for the better by straightening the road. No other hill of consequence until we get to the hill called G. Greene's hill, which is not very steep, and about 40 or 50 rods in length. But two bridges of any considerable consequence, and these not very large; materials, wood and stone abutments. The road four rods wide, and generally a rough, hard, stony soil.

Beside these two there is only one more turnpike road in this district, and that is a very short one, on the road leading from Newport to Bristol ferry, unless the bridge, or more properly the causeway, at Howland's ferry may be called an artificial or turnpike road. This is, indeed, a great work, and will be of great utility. I send a sketch of this causeway, drawn August 3, 1807. Since that time some carriages have passed on it, and, frequently, in this present month, stages have run on this new route to and from Boston in one day.

In order to obtain the best information I could respecting the practicability of uniting the bay of Rhode Island with that of Massachusetts, either by Taunton or Providence river, or by any other route, I wrote a letter to Samuel Fales, Esq., a copy of the answer to which I enclose. My letter to him he showed to Jones Godfrey, Esq., a representative from Taunton to the General Court of Massachusetts, which produced a letter from him to me, a copy of which is also enclosed. You will observe that he had written a letter to Colonel Baldwin, requesting him to state such facts as he had collected from his survey, and to send them to me as soon as convenient. I have not received a line from him; nor do I ever expect to receive one from him; for, when I was in Massachusetts, I was well informed that his life was despaired of, or I should have visited him. I wrote also a letter to the collector of Providence, more than a month ago, desiring him to give me such information as he could obtain, touching a practicable water communication from Pawtucket or Rehoboth river to tide water at Charles river, Cambridge, or Boston bay, to which I have not received an answer; when I do I will send you a copy of it.

From the letters of Mr. Fales and Mr. Godfrey, and conversation with some gentlemen in Massachusetts, I am persuaded that the shortest, most feasible, and least expensive, water route from our bay to that of Massachusetts, could be formed by the way of Taunton river. Thus, sir, I have given you the best information I have hitherto been able to collect, and wish it may be acceptable. If I should obtain any further information, seasonably, I will communicate it.

I am, with respect, sir, your obedient servant,

WM. ELLERY, *Collector.*

ALBERT GALLATIN, Esq., *Secretary of the Treasury.*

RHODE ISLAND BRIDGE.

This bridge connects the northeast end of the island with the main land in Tiverton, at a place called Howland's ferry, about eleven miles from Newport. It is 1524 feet in length from the west end on the island to the east end on the main, and 864 feet between the former abutments of the old (wooden) bridge, where the average depth of water is 39 to 40 feet, and the greatest depth 59 to 60 feet at high water. This bridge is building on the following plan: a sufficient quantity of stone, to be thrown promiscuously into the river, in a line across, to form a base, with such declivity on each side as the stones shall rest at, and of such width as will make a ridge levelled to 35 feet wide at low-water mark. On this base a causeway to be raised five feet above high-water mark, and to be 31 feet wide on the top, for the passage way; the walls of which to be built with large flat stones; the space between to be filled with stone, and the top levelled with gravel. On each side to be erected a substantial fence or wall, for the safety of passengers. The whole to be filled up and built in this manner, except a passage of 66 feet near the centre of the river, over which a draw-bridge to be thrown.

This great and novel work was undertaken the last summer, and the following is the present state of it: from the east end of the bridge to the draw, a distance of 757 feet, is nearly completed; a draw-bridge, on a very simple and good model, is thrown over the passage left in the river, to open 30 feet for vessels to pass, which is worked with great ease and despatch by one man; from the draw, westward, 184 feet is filled up to low-water mark; on the west end 140 feet is nearly complete; and 228 feet further eastward is filled up to low-water mark; the remaining space, about 150 feet, is filled up, on an average, within five feet of low-water.

It is expected that the bridge may be passed on foot, at low water, on the 1st of September, and probably carriages may pass in October next. The time requisite for the stones thrown in loosely to settle, and form a natural or secure angle, before the side walls can be built up, where it has lately been filled in, will delay the completion of the work till next summer; but it is expected the bridge can be passed by horses and cattle (if not by carriages) without difficulty, after October.

To raise the money requisite for building this bridge a subscription was opened, under the act of incorporation, for 800 shares of one hundred dollars each, which has been subscribed, and it is expected will complete this work.

This undertaking, though not so expensive as many, may be considered as the most enterprising, considering the rapidity of the current, and the very great depth of water; and that it was impossible to make a bridge that would stand, unless by filling up a passage across the river in the manner which has been done. The quantity of stone already used, and which will be required, is immense. The success of the undertaking, and durability of the bridge, cannot be questioned by any who examine it.

There are few works of greater public utility; it establishes a permanent communication with the main land; is the most direct and shortest way to Boston, and the only way to New Bedford. To travel from hence to Boston, via Providence, requires two days; but a line of stages will run, on this new route, across the bridge, to and from Boston, with great ease in one day. It will form an essential security to this island, in case of war with any European power, as it will keep open a communication from the main which cannot be destroyed; and, by stopping up the passage, prevent ships of war from sailing round the island.

The country where this causeway bridge is erected has a delightful climate, and affords a diversified and interesting perspective. In the season there are plenty of curlews, plovers, and other game. The river abounds with almost every kind of fish that is brought to market, particularly the sheeps-head, striped bass, blue fish, and totoague, of the largest size; and for sea bathing no place on the continent can be preferred to it. That it is expected in a few years it will become a fashionable place of great resort, where invalids, *bon vivants*, and parties of pleasure, may benefit their healths, or agreeably pass the summer months.

NEWPORT, RHODE ISLAND, *August* 3, 1807.

D.

TURNPIKE ROADS IN CONNECTICUT.

SIR: COLLECTOR'S OFFICE, MIDDLETOWN, *December* 12, 1807.

Unforeseen difficulties in procuring the information requested in your letter of the 28th of July have prevented an earlier performance of your request, and have rendered that performance, after all, very imperfect.

On the receipt of your letter, I applied myself to discover the commissioners from whom I was to obtain the information; but, as the turnpike roads in this State are so numerous, and in most cases so unimportant, except to a small section of country, that probably no individual has any personal knowledge of one-half of them, I soon found that inquiries *in the country* were useless. I learned that commissioners were appointed by the Governor and Council. I applied to the records of that board; but, as their recorder is one of their own body, appointed, as I understand, from year to year, their records seemed to be imperfect. That circumstance, however, I afterwards found to be of no importance to my inquiry, because, after having applied to some of the commissioners, I learned that they could afford me no satisfactory information, as their duty, besides superintending the roads, directing repairs to be made, &c., extended only to auditing the accounts kept by the companies' own agents, and laying the general result before the General Assembly. I had then the alternative before me of undertaking to discover the agents of the turnpike companies in every part of the State, and procure the information from them, or to content myself with such information as the records of the Assembly and the treasurer, with whom these summary statements were lodged, might afford me. As the former would have been both tedious and expensive, I chose the latter course, and I hope the information obtained will answer the object of the inquiry. During the late session of the Legislature, an investigation of the records was necessarily suspended. Thus much for the causes of delay.

With regard to the specific questions proposed by you, the statements accompanying this, with explanatory remarks annexed, contain answers to many of them as far as they are susceptible of answers. On the subject of bridges I have made no statement. I understand your inquiries to relate to such only as have been built by turnpike companies; and of such I know none that merit particular notice. The truth is, that bridges as well as roads are supported by the inhabitants of the several towns, within the limits of such towns respectively. This is the general law; and as our turnpike roads are, with very few exceptions, old roads repaired at the expense of those who travel them, the bridges have been left as a charge on the towns. Wherever the turnpike road deviates from the old road, the company builds and supports the bridges; but, excepting on the Hartford and New Haven turnpike road, I know of no bridge supported by any of the companies that merits notice. Indeed, in most instances, it is impossible to ascertain the expense of those small bridges that have been built by the companies, as it has generally been the case that the roads, including the bridges, have been made on contract for a gross sum, so that the expense of roads and of bridges form an undistinguished mass.

I have read most of the charters or acts of incorporation. They differ only in respect to some local circumstances. Their general provisions are these: They constitute certain individuals named, with their associates, a body politic; the corporation is named; the mode of organization is directed; the number of toll-gates, and the rate of toll are regulated; the gates to be erected, and the toll to commence whenever the road shall be completed *to the satisfaction of commissioners to be appointed*, &c.; and whenever the capital stock, with twelve per cent. interest thereon, (received annually,) together with all expenses of repairs, &c., shall have been reimbursed, the toll to cease. These are all the provisions, except of a local and unimportant nature. It follows that there is no law regulating the acclivities of hills, or the breadth or structure of roads. All is left to the discretion of commissioners; and that discretion is doubtless influenced by various considerations, such as the nature of the ground, the importance of the road, &c. &c. An opinion has prevailed that something like a general principle had been adopted, that no ascent greater than five degrees should be allowed. Nothing, however, is more certain than that no such principle has been adhered to.

Materials.—On this head our answer will serve for all the roads in Connecticut. No other materials are used than the earth found on the spot. Gravelling, strictly speaking, is unknown. In few instances, and to a very small amount, I have known a strong mould, such as could be most easily obtained, spread on a road of deep sand, to give a degree of solidity, or rather adhesion, to the surface. In short, sir, the improvements that have been made in our roads have been confined to the following objects, viz: avoiding, when practicable, steep and extensive elevations; shortening distances when consistent with other objects; and, principally, removing rocks and stones, &c., and raising a pathway of earth, and draining it.

It will be observed that the capital stock of the "Hartford and New Haven" company is out of all proportion to that of any other company, considering the length of the way. In that case every consideration was sacrificed to a *straight line*. The old road was deserted almost altogether, and a very hilly route preferred to a more smooth, though less straight one. The consequence was, that the company had the ground to purchase, (which, in almost every other instance, was a charge on the towns,) and the hills to reduce. The purchase of the land was a heavy charge. It has been stated to me, by a proprietor, at something more than thirty thousand dollars. Excepting this article, and some, not very expensive, bridges, amounting, in the whole, perhaps, to two thousand dollars, the amount of their stock has been laid out in the same manner, and on a road of the same description with others; that is, a road of earth made on contract. As more labor has been done on this road than on any other, and, as there are heavy articles of distinct and separate expense in this that are not in other cases, I regret that I am not able to state with precision and certainty the amount of each. If this shall appear to you of any importance, I beg

leave to refer you for information to Mr. Hillhouse of the Senate, who is not only a proprietor, but has been a contractor for making the road, and will probably be able to give you as accurate information on the subject as it is possible to obtain.

I suppose you to have before you a map of the State of Connecticut, otherwise my information relative to the direction of the roads, and the points united by them, will be utterly unintelligible. After all, I fear the information will fall short of your expectations; but I know not how I could have done much better; for a detailed statement of minute expenses on a multitude of unimportant roads would have required much labor and expense, and, at the same time, I imagine would have been of no use.

I have endeavored to communicate correct ideas of the present state and character of the improvements in our roads, and to give such data as will enable you to determine with sufficient accuracy the expense of such improvements; and also to ascertain the remuneration received by the proprietors of the roads, respectively. From this view it will appear that the expense of our improvements, imperfect as they are, is as great as any toll that the people will submit to pay, will support. As we have no great market towns, and, consequently, no great avenues from an extensive country to a market, it is probable that we must very long content ourselves with roads of earth.

I am, with perfect respect, sir, your obedient servant,

ALEX. WOLCOTT.

The Hon. ALBERT GALLATIN.

Schedule of turnpike roads completed in the State of Connecticut, with explanatory remarks.

	Am't of capital stock.	Date of first settlement when toll commenced.	Date of last settlement.	Whole receipt of tolls.	Amount of ordinary repairs.	Length of road in miles.	REMARKS.
Hartford and New Haven, -	$79,260 95	June, 1803,	May 1, 1807,	$8,800 74	$5,808 02	34¾	This road is probably the best, as it is doubtless the shortest, from New Haven to Hartford, being nearly a straight line from New Haven, through Wallingford and Berlin, to Hartford.
Granby, - - -	8,438 13	Sept. 19, 1804,	June 28, 1806,	1,753 76	991 13	20	This road extends from Hartford, through Windsor, Granby, and Hartland, to Granby, in Massachusetts.
Fairfield, Western, & Reading,	1,895 02	April 20, 1804,	May 1, 1805,	198 05	165 50	12	From Fairfield to Reading.
Ousatonick, - -	13,884 58	Jan. 1, 1804,	Jan. 1, 1806,	1,941 60	1,719 84	20	From Derby to New Milford.
Derby, - - -	7,520 00	Jan. 1, 1804,	Jan. 1, 1805,	1,049 19	273 48	8	From New Haven to Derby.
Oxford, - - -	4,045 61	Dec. 31, 1803,	Jan. 1, 1806,	2,096 45	532 84	8	From Derby to Southbury.
Remmon falls, - -	9,443 45	Jan. 1, 1804,	Jan. 1, 1806,	1,256 38	985 04	6	From New Haven to Derby.
Farmington river, - -	11,751 28	Oct. 9, 1804,	April 23, 1807,	2,110 41	1,025 32	11	From New Hartford, along on the border of Farmington river, to the line of Sandsfield, in Massachusetts, and is continued from thence, through Lenox, to Pittsfield.
Green Woods, - -	19,481 87	Sept. 1, 1804,	Feb. 1, 1807,	9,453 03	5,486 21	21	This road commences with the preceding; and, northwesterly, through Norfolk and Canaan, to Sheffield, in Massachusetts.
Canaan and Litchfield, -	10,565 23	Sept. 18, 1803,	Nov. 18, 1806,	7,048 78	3,753 06	20	From Litchfield, through Canaan, to Sheffield.
Cheshire, - -	22,810 44	Oct. 1, 1804,	Oct. 1, 1806,	5,494 23	2,105 89	17	From New Haven, through Cheshire, to Southington. This is a stage route from New Haven to Hartford, and, though not so short, is preferred by some to the Berlin road.
Streights, - -	16,796 47	Oct. 22, 1803,	Oct. 22, 1806,	11,582 90	7,994 12	36	From New Haven to Litchfield.
Litchfield and Harwinton, -	5,406 28	April 1, 1804,	April 1, 1807,	3,094 63	1,147 48	11	From Litchfield, through Harwinton, to Bristol, where it joins the Farmington and Bristol road, and is the stage road from Litchfield to Hartford.
New Milford and Litchfield,	4,506 95	Nov. 12, 1803,	May 1, 1807,	3,313 49	1,182 53	12	From New Milford to Litchfield.
Farmington and Bristol, -	15,252 10	Oct. 3, 1805,	Oct. 3, 1807,	1,147 13	224 99	10	From Farmington to the Litchfield and Harwinton T. P. road in Bristol.
Boston, - - -	17,073 30	Sept. 20, 1805,	Jan. 12, 1806,	2,085 35	2,072 78	52	This is called the Middle road from Hartford to Boston, and is, at present, the shortest, though not the best route; it runs through East Hartford, Boston, Coventry, &c., to Thompson, and the line of Massachusetts at Douglass.
Hartford and Tolland, -	8,874 17	June 28, 1805,	June 6, 1807,	2,489 35	726 01	16	This road, which runs through East Hartford to Tolland, is continued by the Stafford Pool turnpike, through Stafford to the line of Massachusetts. Stages run on this road from Hartford to Boston.—(See Stafford Pool turnpike.)
Waterbury river, - -	38,769 94	Oct. 3, 1805,	Nov. 22, 1806,	1,572 40	365 67	41	From Waterbury, through part of Litchfield, Harwinton, Farrington, Winchester, &c., to Massachusetts line.
Windham, - -	8,679 75	Sept. 20, 1805,	Aug. 14, 1806,	2,985 75	2,309 64	30	From the New London and Windham County Turnpike, in Plainfield, to the Boston turnpike, in Coventry.
Middlesex, - -	17,544 88	Dec. 31, 1805,	Dec. 31, 1806,	4,494 22	3,096 73	35	From Wethersfield, through Middletown and Haddam, to Saybrook, at the mouth of Connecticut river.
Bridgeport and Newtown, -	22,619 81	April 17, 1806,	April 1, 1807,	3,357 27	914 80	26	From the borough of Bridgeport, on the Sound, through Newtown, to N. Milford.
Danbury and Bridgefield, -	1,907 80	April 17, 1806,	April 1, 1807,	409 98	140 21	10	From Danbury to Ridgefield.
Norwalk and Danbury, -	2,833 64	April 17, 1806,	April 1, 1807,	677 42	429 03	22	From Norwalk to Danbury.
New Preston, - -	5,405 07	May 2, 1806,	May 1, 1807,	426 17	115 07	10	From the New Milford and Litchfield turnpike, in Washington, to the line of the State of New York, toward Fishkill.
Torrington, - -	11,889 07	April 30, 1806,	April 30, 1807,	1,089 77	1,201 15	18	From Litchfield, through Torrington, to West Simsbury, and joins the Talcott mountain turnpike.
Norwich and Woodstock, -	14,100 00	May 26, 1805,	April 26, 1807,	408 90	705 00	39	From Norwich to the Massachusetts line in Woodstock.

SCHEDULE—Continued.

	Am't of capital stock.	Date of first settlement, when toll commenced.	Date of last settlement.	Whole receipt of tolls.	Amount of ordinary repairs.	Length of road in miles.	REMARKS.
Talcott mountain, - -	$8,839 67	Oct. 1, 1804,	Oct. 1, 1806,	7,361 44	3,053 60	19	From Hartford, through Simsbury, to New Hartford, where it is continued, by Farmington river turnpike, to Lenox, &c., and, by the Green Woods' turnpike, to Sheffield.
Hebron and Middle Haddam,	7,907 71	April 16, 1805,	April 16, 1806,	294 44	-	13	From Hebron, in Tolland cty. to M. Haddam Landing, 6 miles below Middletown.
Salisbury and Canaan, -	6,005 05	May 1, 1805,	May 1, 1807,	713 87	294 23	10	From Canaan and Litchfield turnpike, in Canaan, by Salisbury furnace, to the line of New York.
New London and Windham county.	4,806 92	May 1, 1795,	April 1, 1805,	3,451 08	2,498 22	24	From Norwich, through Plainfield, Sterling, &c. to the line of Rhode Island, and is the stage road from Norwich to Providence.
Hartford, New London, Windham, and Tolland county.	5,881 50	April 1, 1805,	April 1, 1807,	3,692 07	2,157 37	23	This is the stage road from Hartford to Norwich, and extends from the east line of East Hartford to Norwich line.
Stafford Pool, - -	10,515 00	-	-	-	-	13	No account has been rendered of receipts or expenditures. This is a continuation of the Hartford and Tolland turnpike road, and is, at present, the best route from Hartford to Boston; it extends from Tolland to the Massachusetts line, and companies are incorporated in Massachusetts, as it is said, to continue the road in as direct a line as is practicable to Worcester, and thence to Boston. The road from Worcester to Boston is in considerable forwardness. When completed, this will probably be the shortest and much the best route from New York to Boston that has been, or probably will be, projected.
Pomfret and Killingly, -	3,706 00	-	-	-	-	8½	No account rendered. This road branches off from the Boston turnpike, in Pomfret, and passes through Killingly to the Gloucester turnpike road at the line of Rhode Island, and is now a stage route from Hartford to Providence.
Woodstock and Thompson, -	5,596 77	-	-	-	-	-	No account rendered, and distance not ascertained. From the Providence turnpike road, at the line of the State, through Thompson and Killingly, to the Norwich and Woodstock turnpike road, in Woodstock.
Hartford and New London, -	-	-	-	-	-	42	No account has been rendered, though the road has been several years completed. This is the most direct and best road from Hartford to New London, through E. Hartford, Glastonbury, Marlbro', and Colchester, and is a stage and postroad.
Colchester and Norwich, -	-	-	-	-	-	11½	No account has been rendered. The road is but lately completed. This road puts off from the preceding at Colchester, and extends to Norwich, and is probably the shortest and best route from Hartford to Norwich.
Connecticut and Rhode Island,	-	-	-	-	-	-	No account has been rendered, and the road but lately finished. This road branches off from the the Boston turnpike road, at Ashford, and passing through Pomfret and Killingly, meets the Gloucester turnpike road at the line of the State. A stage has commenced running on this route, and it is probable the best route from Hartford to Providence.
Mohegan, - -	-	-		-	-	13	This road was established on different principles from any other in the State. It is the road between New London and Norwich, and was our first experiment at repairing roads by a toll. A company was incorporated, and authorized it to collect a toll previous to any improvement of the road, the whole amount of which toll they were to lay out in improvements. The road has, of course, been for many years in a progressive state; and, from one of the worst in the State, has become a pleasant, though very hilly one.
New Haven and Milford, -	-	-	-	-	-	12	No account for the New Haven and Milford road has been rendered. The road extends from New Haven to Strafford ferry, on the Ousatonick river, on the route to New York.

A table showing the rate of tolls for every two miles.

	Cents.		Cents.
Four wheeled pleasure carriage, - -	25	Sleighs, pleasure or loaded, empty, - -	3
Chaise or sulkey, - - - -	12½	Man and horse, - - - -	4
Loaded cart or sled, - - - -	8	Mail stage, - - - - -	6¾
Empty do. - - - - -	6¼	Every other stage, - - - -	25
Loaded wagon, - - - - -	12½	Single horse cart loaded, - - -	6¼
Empty do. - - - - -	6¼	Ditto empty, - - -	4
Horses, cattle, and mules, (each,) - -	1	Sheep and hogs, - - - -	½
Sleighs, pleasure or loaded, - - -	6¼		

Every charter for a turnpike road has been examined. To state the rate of toll for each gate, and the number of gates allowed on each road, would be tedious and doubtless useless. One gate is established for each ten miles of road, as nearly as circumstances would admit, and, when it is otherwise, the rate of toll is conformed to the length of road.

The rate of toll is not on all roads precisely the same; but generally it is as stated in the annexed table. The deviations are so few, and so unimportant, that it has not been thought necessary to notice them.

Schedule of turnpike roads projected (but not completed) in the State of Connecticut.

Stratford and Weston.—From Stratford to Weston. Incorporated, October, 1797.

Windham and Mansfield.—This road extends from Franklin, northerly, through Windham, Mansfield, &c. to Stafford. It was incorporated May, 1800; what progress has been made on the road has not been ascertained.

Greenwich and Ridgefield.—This road extends from Danbury, through the west part of Greenwich, towards New York. Incorporated, May, 1802.

Goshen and Sharon.—This road is to extend from the Torrington turnpike road, in Torrington, through Goshen, Cornwall, and Sharon, to meet the Duchess county turnpike, at the line of the State of New York. Incorporated, May, 1803.

Washington.—This road is to extend from Woodbury, through Washington, to the east end of the New Preston turnpike road. Incorporated, October, 1803.

Thompson.—This road is to extend from the Gloucester or Providence turnpike road, at the line of the State of Rhode Island, northwest, through Thompson, &c. to the line of Massachusetts. Incorporated, October, 1803.

Middle road.—This road is to extend from Farmington, through Bristol, Plymouth, Waterbury, Woodbury, Southbury, and Newtown, to Danbury, and was incorporated in October, 1803.

Hartland.—This road extends from the stage road in Suffield, through Granby and Hartland, to the Green woods' turnpike road in Colbrook. Incorporated, May, 1806.

N. B. In October, 1798, a company was incorporated for the purpose of building a bridge over Connecticut river, at Suffield. The bridge is begun, and it will probably be finished the next season; when it is supposed this will be the best route from the eastern part of Connecticut and Rhode Island to Albany, &c.

Warren.—The Warren turnpike road is to extend from the Canaan and Litchfield turnpike road, in Canaan, through Warren, &c., to the New Preston turnpike road, in Washington. Incorporated, May, 1806.

New London and Lyme.—From New London, through Lyme, to Connecticut river. Incorporated, May, 1807.

Connecticut.—This road is to extend from Fairfield to Byram's river, (the boundary of the State of New York,) and is to follow the present route from Fairfield to New York, excepting such variations as may be thought necessary for the improvement of the road, &c. Whenever this road shall be completed, the whole of the route from New York to Boston, within the State of Connecticut, will be a turnpike road; (except a short space, of very level road, from Fairfield to Stratford Ferry;) that is to say, the "Connecticut," the "New Haven and Milford," the "Hartford and New Haven," the "Hartford and Tolland," and the "Stafford Pool" turnpikes, constitute as good a route, perhaps, as can be hoped for. I speak in reference to distance, the nature of the ground, and the state of the population generally. The road itself is susceptible of vast improvement, and it is probable that some deviations might be made to advantage. For instance, it is a general opinion, that the best route from New Haven to Hartford would be through Dorham and Middletown, though the distance must always be greater, by two or three miles, than on the present route; the advantages of ground and population are probably more than sufficient to countervail that advantage.

TURNPIKE ROADS IN NEW YORK.

A sketch of the turnpike roads in the State of New York, by Benjamin De Witt, Secretary of the Society, Fellow of the American Academy of Arts and Sciences, Member of the Massachusetts Agricultural and Historical Societies, &c. &c.

The progress of improvements in public highways, turnpike roads, bridges, and canals, has ever been considered an interesting subject. There is an inseparable connexion between these and the agriculture, arts, and commerce of a country. The condition of the former is a criterion of the advancement of the latter. The one is a natural and necessary consequence of the other. Where there is no agriculture, there are no roads; and without roads, there can be but little commerce. Hence, the existence of roads has been considered as a line of demarcation between the civilized and the savage state; and hence, also, the excellence of public highways marks the degree of general improvement in a country. Thus, the rude essays of the early Peruvians, in constructing their celebrated great roads, has contributed to rank them amongst the civilized, instead of the savage nations; and thus the beauty and perfection of the famous Roman highways characterized the flourishing state of that ancient empire. Thus, also, in our own country, the contrast between our present turnpike roads and the dismal footpaths of the aborigines is not greater than between our state of civilization and refinement and their condition of rudeness and barbarity.

Taking into consideration the newness of our country, and the infancy of many of its settlements, the people of the United States have not been inattentive to the making of roads and the building of bridges. Generally speaking, the progressive improvement in these things has been as rapid as the increase of our population, agriculture, and commerce. Perhaps no country in the world, under similar circumstances, has done more in so short a period of time. But, as it belongs peculiarly to each individual State to encourage and patronise its own domestic works of utility and convenience, every State may be considered, in relation to matters of this kind, as a distinct country and people. Accordingly, a great diversity of condition will be perceived in the different States. Some have made greater progress in one species of improvement; some in another. Some are furnished with excellent turnpike roads; some have opened extensive canals; some have built magnificent bridges; whilst others have scarcely turned their attention to these subjects. To estimate the various exertions of the individual States, to show what each may have done in these beneficial undertakings, and thus to furnish the means of instituting a comparative inquiry between them, would be both interesting and useful. It would excite a rival spirit of emulation amongst them. One would receive instruction from the example of the other; and all would be benefited by a knowledge of the progress of improvement in each. But this would be a difficult task for any one person to perform. My design in this communication is not to go beyond the limits of my native State.

Within a few years past the State of New York has undoubtedly made very rapid advances in improving and opening roads. The Legislature have, from time to time, made liberal grants of money, drawn from the avails of lotteries and other sources, for opening new roads in the western and northern parts of the State. But so rapid has been the population of the new lands, by emigrations principally from the New England States, that all the ordinary resources were found inadequate to satisfy the demands of the country for roads. Hence, the system of establishing turnpike companies was resorted to. The prospect of increasing the value of lands, by the establishment of good roads, the expectation of profit from the tolls granted by the Legislature, and the more fascinating project of speculating in turnpike stock, induced a large portion of the community to embark a part of their capitals for these purposes. The spirit of turnpiking consequently spread over every part of the country; millions were vested in stock, and the State has become covered with turnpike roads. The number of these incorporated companies, the great distance of road they are about to make, and the vast amount of capital granted to them, constitute so extensive a system of turnpiking that important consequences are to be anticipated from it. The immediate effect of opening and improving a great extent of road, and building numerous bridges, must, without doubt, prove beneficial in a high degree to the State, inasmuch as they encourage settlements, open new channels for the transportation of produce and merchandise, increase the products of agriculture, and facilitate every species of internal commerce. But what may be the ultimate effect, in a country, and under a Government like ours, of the establishment of these numerous incorporated companies, with large capitals, having all one common interest and object, with the privilege of exacting large contributions of toll from the community, for an unlimited period of time, remains to be determined by experiment. The succeeding statement of the several turnpike and bridge companies, with the amount of their capital stock, and the distance of road to be made, will serve to show how far we have gone into this system, and enable every one to draw his own conclusions. It is a document which certainly furnishes a pleasing indication of the enterprise and prosperity of the people of this State; and, whilst it may have a tendency to excite the emulation of our sister States, it cannot fail, I think, to be useful even to our own legislators, who, above all, ought to be minutely acquainted with the subject.

It is proper to premise that the amount of the capital stock of the companies, as stated, is taken from the acts of the Legislature. There is reason to believe that at least the whole of that amount will be required to complete the roads; for several of the companies first incorporated have been obliged to apply to the Legislature for an increase of their stock, to enable them to finish their work.

The distance of road, as stated, is taken, in some instances, where the roads are already finished, such as the Albany and Schenectady, the Mohawk, the Seneca, and others, from actual measurement. The distance of others is ascertained as nearly as could be by measurement on the State map, in straight lines from place to place, as designated in the laws; and of some of the short roads, where the places of beginning and termination are not sufficiently marked for measurement on the map, the distance is conjectured from the number of gates permitted by law to be erected across them. On the whole, the statement will be found to be not far from the truth. It is, at all events, sufficiently accurate to furnish a general view of the subject.

The roads distinguished by an asterisk in the list are either wholly or nearly finished; and the companies have received permits from the Governor to erect gates, and receive toll for about nine hundred miles, as appears from the papers in his office. Many of the other companies are progressing in working their roads, and have portions of them nearly finished; but are not yet authorized to erect gates and turnpikes.

List of toll bridges, with their capital stock.

	Capital stock.		Capital stock.
Schoharie-kill bridge, - -	$10,000	Schoharie creek, north, - -	$5,000
Catskill, - - - -	5,000	Wallabought and Brooklyn, - -	15,000
Cayuga, - - - -	25,000	Delaware, - - -	20,000
Canajoharie and Palatine, -	10,000	Susquehannah, - - -	20,000
Jericho, - - - -	10,000	Canton, - - - -	6,000
Troy, - - - -	150,000	Farmers', - - - -	3,000
Union, - - - -	50,000	Cohoes, - - - -	7,500
Fort Miller, - - -	40,000	Jefferson, - - - -	4,000
Newtown and Bushwick, - -	7,500	Mohawk, (stock included in Mohawk turnpike.)	
Montgomery, - - -	13,500		
Schoharie and Cobleskill, - -	6,000		
Fort Hunter, - - -	7,500		$415,000

List of turnpike roads, with the amount of the capital stock of the companies, and the distance of the roads to be made.

	Capital stock.	Length of road.
	Dollars.	Miles.
*First Great Western turnpike road,	180,000	52
*Columbia,	25,000	20
*Rensselaer and Columbia,	32,000	28
*Eastern, (with a diverging road,)	50,000	40
*First Northern,	90,000	60
*Seneca, (two roads,)	177,500	112 and 45
*Susquehannah,	116,000	80
*Orange,	21,000	25
*Mohawk,	190,000	80
*Westchester,	25,000	10
*Newburgh and Cochecton,	80,000	60
*Chenango,	64,000	65
*Oneida,	30,000	25
*Union,	50,000	30
*Stephentown,	8,000	10
*New Windsor and Blooming-grove,	7,500	10
*Second Great Western,	50,000	45
*Flushing and Newtown,	15,000	5
Quaker Hill,	10,000	10
*Albany and Schenectady,	140,000	14
Troy and Schenectady,	60,000	15
*Hudson branch,	20,000	10
*Ulster and Delaware,	125,000	110
*Dutchess,	60,000	35
*Schoharie,	78,000	60
Newtown,	30,000	20
Canandaigua and Bath,	50,000	35
Third Great Western,	105,000	90
*Ancram,	24,000	20
Susquehannah and Bath,	300,000	100
*Albany and Bethlehem,	30,000	5
Fall Hill turnpike and bridge,	12,500	15
*Chatham,	10,000	10
*Coxsackie,	41,000	25
Albany and Delaware,	150,000	75
Little Delaware,	100,000	60
Lake Erie,	200,000	130
Fourth Great Western,	40,000	30
*Hillsdale and Chatham,	35,000	20
Cayuga,	175,000	120
Ontario and Genesee,	175,000	90
Onondaga salt spring,	100,000	55
Great Northern,	150,000	130
Delaware,	75,000	50
Newburgh and Chenango,	162,000	80
Neversink,	162,000	80
Popachton,	210,000	90
Plattsburgh and Chateaugay,	55,000	40
Utica,	30,000	30
Rome,	20,000	20
Greenfield,	26,000	20
Farmers',	100,000	35
Ulster and Delaware First Branch,	40,000	25
Waterford and Whitehall,	150,000	60
Waterford,	60,000	40
Newburgh and New Windsor,	5,000	5
Schenectady and Ballstown,	2,000	5
Unadilla,	62,500	40
Jamaica and Rockaway,	20,000	15
Canajoharie and Charleston,	30,000	20
Hamilton and Schaneateles,	84,000	70
Mohawk bridge and Ballston,	40,000	20
Highland,	250,000	110
New Baltimore and Rensselaerville,	20,000	20
Mexico,	50,000	50
Middleburgh and Rensselaerville,	15,000	15
Albany and Greene,	40,000	35
67 turnpikes.		
21 bridges.	$5,141,750	3,071
— Bridge stock as above,	415,000	
88 companies.		
Total,	$5,556,750	

From this statement it will be perceived that our system of road-making is rendered interesting at first sight by its very magnitude. Eighty-eight incorporated turnpike road and bridge companies, with a capital of more than five millions and a half of dollars, established within the period of seven years, for the purpose of building more than twenty large bridges, and making more than three thousand miles of turnpike road, whereof twenty-eight roads may be said to be finished, comprising, together, a distance of nine hundred miles of turnpike road complete, are facts that show, in a striking manner, the great and rapid progress of the State in prosperity, in enterprise, in population, in agriculture, in commerce, in wealth, in strength, and in national resource.

The greatest extent of road in continuation, already finished, is from the Massachusetts line, near Lebanon springs, through Albany, Schenectady, and Utica, to Canandaigua, in the county of Ontario, a distance of two hundred and thirty-four miles; which, with a continuation of about ninety miles more, to Black Rock, on Lake Erie, to be made by the Ontario and Genesee company, will intersect the State from east to west by a line of turnpike roads three hundred and twenty-four miles in length.

To give a concise view of the general course and direction of these roads, and, at the same time, to show their commercial importance, let us consider the city of New York as the centre of commerce, or the heart of the State, Hudson river as the main artery, the turnpike roads leading from it as so many great branches, extending to the extremities, from which diverge the innumerable small ramifications or common roads into the whole body and substance; these again send off the capillary branches, or private roads, to all the individual farms, which may be considered as the secretory organs generating the produce and wealth of the State.

As we proceed, then, up the great artery of commerce, the Hudson, the first branch we come to, on the west side, is from Newburgh to Cochecton, on the Delaware, which river there divides this State from Pennsylvania. This road, it is understood, will be continued westward by the State, and will open the nearest and most convenient market on the Hudson, for the agricultural produce of the northeastern part thereof. From the Newburgh and Cochecton road diverges the Newburgh and Chenango, in a northwestern direction, through the counties of Ulster and Delaware, across the Susquehannah river, at Jericho, to Oxford, in the county of Chenango, where it communicates with other great roads leading to the western counties, as will appear in the sequel.

The next great branches we come to are, from Kingston to Jericho, in Chenango county, on the Susquehannah river; from Kingston to the west branch of Delaware, in the town of Walton, and from Rochester, in Ulster county, to Chenango point.

As we advance up the Hudson we meet, successively, the branches of turnpikes from Catskill to Wattles' Ferry, on the Susquehannah river; from Catskill to the mouth of little Delaware river; from the town of Coxsackie, to intersect the great western road at Cherry valley; from the village of Coxsackie to intersect the Catskill and Susquehannah road; and from New Baltimore to intersect the Albany and Delaware road.

We arrived next at the city of Albany, and the neighboring villages of Troy, Lansingburg, and Waterford at the head of the sloop navigation of the Hudson. Here we see a great cluster of ramifications, no less than eight turnpikes proceeding directly from the city of Albany alone towards almost every point of the compass. The first of these I shall mention is the Albany and Delaware; it runs in a direction a little south of west to the town of Otego, on the Susquehannah. Here it is to be observed, that Otego, Wattles' Ferry, Jericho, and Chenango point, where almost all the aforementioned roads terminate, are places on the Susquehannah river, not far from each other, and are connected together by the Unadilla turnpike. All these roads, therefore, from Newburgh, Kingston, Catskill, and Albany, are to be considered as communicating with, and continued by the great road to be made from Jericho to Bath, in Steuben county, and from thence along the head of Chataughque Lake to Lake Erie, at the westernmost point of the State, about three hundred and fifty miles from Hudson river.

Another great branch from the city of Albany, is the great western road to Cherry valley, in Otsego county. This sends off one branch from Duanesburgh to the Mohawk river, at Canajoharie; a second, by the second company from Cherry valley through Cooperstown to the Chenango river, in the town of Sherburn; and is continued by the fourth company to the town of Fabius, in the county of Onondaga. A third branch, by the third company, through the towns of Warren, Otego, Richfield, Plainfield, Bridgewater, Sangersfield, and Hamilton, to Cazenovia; thence to intersect the Seneca turnpike in Manlius, or through Pompey and Marcellus to the outlet of the Schaneateles lake. And a fourth branch from the town of Burlington, in Otsego county, to the town of Homer, in Onondaga, where it branches on the right to intersect the Seneca turnpike at the Cayuga bridge, and on the left, along the head of Cayuga lake, to intersect the great road from the Susquehannah, to Bath and Lake Erie.

The next great branch of turnpike road worthy of notice, is the Albany and Schenectady, continued by the Mohawk company to Utica; from thence, by the Seneca to Canandaigua, and from thence by the Ontario and Genesee to Black Rock, on Lake Erie. Of this line of roads the Mexico turnpike may be considered as a branch diverging by the public road from Utica to Rome, and extending from Rome to the mouth of Salmon river, in the town of Mexico on Lake Ontario.

The next in order are the roads from Lansingburgh and Waterford, extending northerly on each side of Hudson river, sending off branches into the State of Vermont, and continued by the great northern road to the north line of the State of the forty-fifth degree of latitude.

And lastly, amongst these important turnpikes may be enumerated the several roads on the east side of Hudson river, extending eastward from Poughkeepsie, Rhinebeck, Hudson, Albany, Troy, and Lansingburgh, to the States of Connecticut, Massachusetts, and Vermont.

This transient review of our turnpike roads will enable us to form a competent idea of the flourishing condition of the State, and the accelerated progress of her improvements. It will enable us to estimate how far these improvements are calculated to favor the new settlements, to promote the increase of the State, and to facilitate transportation of produce and merchandise from its interior and remote parts, as well as to draw large supplies from the neighboring States. For owing to the natural advantages of our geographical position, in relation to the States of New Jersey, Pennsylvania, Connecticut, Massachusetts, and Vermont, a large portion of whose territories are nearer and more convenient to Hudson river, than to any other place of deposite, much of their produce must eventually take that direction; and this will be materially promoted by opening and making good roads.

SIR: NEW YORK, *December* 8, 1807.

I hereby do myself the honor to wait on you with the promised information of roads which are immediately connected with the western inland navigation, and of those which, hereafter, may be made, and become connected with the same, and serve as portages.

From the yearly visits I have made to the western part of our State, and my stay on the lakes for several months in each year, as also my frequent tours by the western inland navigation to Lake Ontario and back again, I have obtained a tolerable knowledge of that navigation, and of its great importance for the internal commerce of our State, and in no less degree of that of the United States, at large, for the future; moreover, when that inland navigation is viewed, to what improvements it is capable to be extended: I, therefore, take the liberty to give also some information of that navigation, from which a more comprehensive view may be had of those roads which are immediately connected with the same, and which must be considered the present portages on that navigation between New York and Lake Ontario.

The first road which presents itself, is between the Hudson and the Mohawk, from Albany to Schenectady; its distance is fifteen miles on a well made turnpike. The Mohawk river is, in certain seasons, (in the spring and autumn,) navigable by boats carrying from one hundred to one hundred and twenty-five barrels of potash or flour; or

from three hundred and fifty to four hundred bushels of wheat; but in the summer season these boats are not able to carry more than half that burden, which is occasioned by the shallowness of the water, or numberless shoals and rapids in that river, which, however, may be improved in such a manner as to leave no doubt to float boats over these obstructions with two hundred and fifty barrels, or six hundred bushels of wheat at all seasons by open water; but whether the present canal company will be able to undertake, and make the requisite improvements in that navigation, remains a matter of much doubt; judging from their slow proceedings in the improvement in that navigation, the prospect is not flattering.

At the Little Falls, sixty miles from Schenectady, the first improvement of this navigation (here was formerly a portage of one mile) is visible; the company have erected at this place six locks with a short canal; another short canal is at the German Flats, (Herkimer.) From the locks at the Little Falls to Rome, (Fort Stanwix,) the distance is about forty miles; at Rome, the Mohawk river is but one mile from Wood creek, which creek empties itself into the Oneida lake; at this place there was formerly a portage of one mile; the Mohawk is now united by a canal and lock with Wood creek; from this canal, at Rome, to the Oneida lake, by the serpentine route of Wood creek, the distance is twenty-three miles, of which five miles in that creek have been improved by placing three locks or cross dams in that creek. The country between Rome and the Oneida lake is perfectly level, and the distance, from point to point, but fifteen miles; to render this distance navigable for boats with from one hundred and fifty to two hundred barrels, would require a canal of ten miles, to wit: from the present canal by a canal into Fish creek to a certain point, and thereby into the lake at the junction with Wood creek.

The Oneida lake may be navigated by boats of from forty to sixty tons burden. Its length is, from Wood creek to its outlet (Onondaga river) twenty-two miles, and its circumference about seventy-five miles. This lake concentrates the whole western inland navigation; nothing can pass by water from Lake Ontario to Schenectady but through this lake; hence, it will appear that every road from the interior, striking this lake, facilitates the inland navigation, and this navigation is required by an immense tract of land which lays on each side of it. On the outlet of this lake, where it assumes the name of river Onondaga, lays a bar or shoal across from the shallowness of the water on the same, particularly at a time when the water in the lake is low, boats with but thirty barrels, find it tedious to pass the same; from this outlet to Three River point, the river is in like manner obstructed by shallows, shoals, and rapids, which makes it tedious to boats in coming up, and dangerous in descending it. At Three River point the Seneca unites with that of Onondaga, and assumes the name of Oswego river. The Seneca river forms a vast and extensive communication with all the lakes and waters in the military and Genesee tracts. From Three River point to Oswego, (the harbor of that river on Lake Ontario,) are continual shoals and great rapids in that river, and a fall of twelve feet perpendicular; at which fall there is at present a portage of about one mile. This navigation is extremely dangerous and tedious. Its distance from the two mentioned last points is twenty-four miles; and it will take four boatmen three full days in making these twenty-four miles, and with not more cargo than from twenty-four to thirty barrels. Many boats are lost, and cargoes either damaged or lost altogether. The canal company, since its incorporation, has never undertaken the smallest improvement in the rivers west of the Oneida lake. Their attention has been solely attracted to the improvements in the Mohawk river; from what motives, however, is unknown to me. The whole distance from Lake Oneida to Lake Ontario, by that navigation, is about fifty miles, with its portage at the Oswego Falls.

In consequence of this tedious and dangerous navigation, which is also expensive, on account of lost time, which burdens the produce of the country, as well as its commodities for consumption, it was considered expedient and proper to find out the shortest route between Lake Ontario and Lake Oneida, and to apply to our Legislature for an act of incorporation for a turnpike company, which was obtained at the session before the last, and a company was incorporated by the title of "The Mexico Turnpike Road Company." From the harbor of Salmon creek, on Lake Ontario, fifteen miles east of Oswego, to Rotterdam, on the Oneida lake, distance twenty-two miles from lake to lake, the country is level, and altogether well for a good road; and from Rotterdam, on the Oneida lake, to the canal at Rome, distance twenty-eight miles. This company has formed itself for the sole purpose to facilitate the inland navigation; and by this road, from one lake to the other, the distance will be shortened nearly thirty miles, and will, with much expedition, forward the transportation of merchandise and produce between New York and Lake Ontario; and it will lessen the expenses of transportation by this route more than one-half between these lakes. Thus, this road may be considered as a second portage to the inland navigation. Hence, it appears that, as long as the whole inland navigation is not improved, or, at least, the waters which unite Oneida lake with that of Ontario remain as they are at present, this road will be the portage for that navigation. The portages thus appearing in the whole navigation are two; the one between the Hudson and the Mohawk; the other between Lake Oneida and Lake Ontario, together, forty-seven miles.

Coming on Lake Ontario, we behold an extensive navigation for vessels of any burden, and opens a vast and extensive communication by water, almost without interruption; and the almost only one is at the most westerly point of that lake, at Niagara Falls, where a portage is of eight miles across those falls. After passing this portage, an extensive navigation we have in our sight, and with vessels of two hundred tons burden; and, on passing over another portage between Lake Erie and the Allegany river, this navigation extends even to Pittsburg, on the Ohio. By this route, the salt is now carried from the Onondaga salt works to Pittsburg, on the Ohio.

Among the projects of great roads now on foot in the western part of our State, is one in particular which deserves notice. It is that from Lewiston, Niagara, to Oswego, and from thence to the Oneida lake, and from here to Redfield, to intersect the great State road from Albany at that town, leading through the Black river, and St. Lawrence county, to Kingston, Upper Canada. This road will strike at and along almost all the harbors on Lake Ontario; and, when the same is continued from Niagara to Presque Isle, on Lake Erie, and from there to Pittsburg, on the Ohio, this would open a very extensive communication between the Eastern and Western States, through almost the whole extent, from east to west, of our State, and along our inland navigation; and would also bring every traveller from the most western part, by Niagara, to Kingston and Lower Canada. All the Eastern States are contiguous to our State, and this route is much the shortest to the Ohio. Albany, near the eastern bounds of our State, is on turnpike roads to Lake Oneida, one hundred and thirty-seven miles; and Lake Oneida, by the heretofore mentioned route, to Lewiston, at Niagara, one hundred and fifty-three miles; from the latter to Presque Isle, one hundred and ten miles; and from thence to Pittsburg, on the Ohio, one hundred and twenty miles; in all, from Albany to Pittsburg, five hundred and twenty miles. This contemplated great road through our State, which will link together the Eastern and Western States, and open, by the shortest and most convenient route, a vast intercourse, will be of great importance for our State, and for those west of us, and, perhaps, the only means that our frontiers will be speedily settled. The estimate of the expenses are thus calculated:

From Redfield to Lake Oneida, and from there to Niagara,	$25,000
And from Niagara to Presque Isle,	15,000
And from the latter to Pittsburg,	20,000
The whole, by estimate,	$60,000

To make a good road, for this sum, is believed to be practicable. The country is level and highly advantageous for a great road.

Fearful that I have too much intruded with my lengthy communication upon your patience, I close with my apology for this, offering, at the same time, my services for any further information on the subject, whenever you are pleased to command me.

With high respect, I have the honor to be, sir, your most obedient servant,

GEORGE SCRIBA.

SAMUEL OSGOOD, Esq.

D.

STOCKPORT, WAYNE COUNTY, PENNSYLVANIA, *December* 10, 1807.

RESPECTED FRIEND:

I hope thee may pardon the freedom of this address, should the subject be considered as not regularly within the proper routine of public business.

There is a plan projected in this part of the country, of a very important public improvement, that, in the general opinion, meets approbation as promising very great and important advantages to the United States.

It is to form an Appian way or national portage, by the nearest and most eligible route, to unite the navigation of our great western lakes with that of the Atlantic.

The plan projected was to petition Congress to pass a law for the sale of lands on and near those lakes, appropriate fifty per cent. of the proceeds to make the road, the other fifty per cent. to Indian treaties, fortifications, &c.; the road to be made, under the authority of the United States Government, in the most permanent and solid manner, to pay a toll equal to any other turnpike, which toll to belong to the United States Treasury as a fund to the equal benefit of all the States.

We are of opinion, from examining the maps and face of the country, that the most near and eligible route for such a portage will, undoubtedly, be from the east end, or outlet of Lake Erie to the North river, above West Point fort, distance, perhaps, 220 or 225 miles.

The very great and desirable objects contemplated by such an important national improvement, are, to open a communication with an extent of inland navigation for trade, to a distance, and amongst nations or tribes unknown; which great increase of trade will, proportionably, increase our revenue.

That the having a speedy and sure route from the national magazine at West Point to our frontier garrisons, may be of great importance should we be involved in a war.

That we consider such a route could command near all the trade of the British dominions in Upper Canada, and afford us a duty, (as it would be a much cheaper route to supply them than the St. Lawrence.)

It would, also, be attended with many other great advantages that may be contemplated by viewing the map, in which, perhaps, gentlemen may vary in their opinions; exclusive of the great quantities of copper and lead ore, mentioned by Captain Carver, which he considered as an object of profitable trade to the British Government.

I have been requested by the advocates of this plan, to write my acquaintance generally, for their opinions previous to circulating the petition for next Congress.

A letter that I have just received on the subject, from a very respectable and well-informed character in the city of Philadelphia, has the following information:

"I am told that the Secretary of the Treasury is probably now engaged in drawing up a report on such public undertakings as roads, canals, &c., as deserve the aid of Government; probably if he is acquainted with the project of the Appian way in time, he may also introduce it in his report."

The above is the occasion of this address, and, if improper, I hope my freedom may be pardoned, and attributed to my desire to serve the public in promoting so good and valuable an improvement.

By the receipt of this letter I expect to be in the city of Philadelphia, and remain there some time.

A line, by way of answer on this subject, addressed, by post, to care of Hugh Ely, merchant, would be very acceptable to thy real friend

SAMUEL PRESTON.

ALBERT GALLATIN, Esq.

N. B. We calculate that the lands on and near the lakes, with such an improvement, would sell for a sufficiency, more than without the improvement, to make the road.

We also conclude that our citizens are better entitled to the profits of the Indian fur trade, than the Canadians, who are inimical to our Government.

That, by having such a road, we can supply the Indians and settlements of Upper Canada so much cheaper than the British can by way of the St. Lawrence, as to either secure a good duty from them, or monopolize nearly the whole trade; either will add to our revenue, and tend to wither the consequence of Quebec.

If, by a wise policy, we can capture the profits of their trade, we shall have all that may be profitable for us in their whole territory.

The civilizing the Western Indians is certainly a very great national object; introduce the plough, and teach them the art of agriculture; they could live more happy on a very small portion of their lands; would relinquish the most of it, and perhaps, in time, become good subjects to our Government.

I have written my friends, Robert Brown, Philip Van Cortland, and other members of Congress of my acquaintance, on the subject, to whom I refer.

Thy ready friend,

SAMUEL PRESTON.

TURNPIKE ROADS IN NEW JERSEY.

Extract of a letter from James Ewing, Esq., to the Secretary of the Treasury, dated

TRENTON, *November* 11, 1807.

With respect to turnpike roads, the principal one is that which leads from this place to New Brunswick, which is nearly completed, and now in operation. The best information respecting it, I presume, you have already received through the collector of the district of Burlington. There is also a company incorporated for continuing this road from Brunswick to Newark, and I am informed the road is in considerable forwardness. There is also a company formed and incorporated for erecting another turnpike from New Brunswick to the bridge over the Dela-

ware at Easton, called the New Jersey turnpike. This is an important road for this State, and the directors have been so obliging as to furnish me with an ample account of the present state of it, which I take the liberty to enclose.

There are several other turnpikes in the State, of minor consequence, being principally for short distances, and made to accommodate particular parts of the country, and to promote the interest of particular towns.

SIR: SOMERVILLE, *November* 9, 1807.

Your letter to Mr. Campbell requesting answers to certain queries respecting canals and turnpike roads, was, by him, handed to us a few days ago, since which the Board of Directors of the New Jersey Turnpike Company have met and appointed us a committee to answer the same so far as it respects the road they are concerned for; this we have done in the best manner we are able at present to do, and hoping the same may prove acceptable to you, and to those you are to communicate it to,

We remain, sir, your most obedient, humble servants,

ANDREW HOWELL,
DANIEL LA TOURRETTE.

JAMES EWING, Esq., *Trenton.*

Pursuant to a request of the Secretary of the Treasury of the United States to James Ewing, Esq. of New Jersey, and by him to John Campbell, Treasurer of the New Jersey Turnpike Company, for information relative to turnpike roads, the Board of Directors of the New Jersey Turnpike Company beg leave to make the following reply to the queries proposed.

Answer to query 1st. An artificial road is authorized by an act of the Legislature of the State of New Jersey, passed February 27, 1806, commencing at the city of New Brunswick and ending at the eastern abutment of eastern bridge across the Delaware river, distance, by actual survey on the tract of said artificial road as laid out by the commissioners appointed for that purpose, and a return thereof made to the Secretary's office of said State of New Jersey, forty-three miles and one-third.

2d. The elevation allowed by law, in the progress of the road, is three, four, and five, degrees at different points, in proportion as the natural face of the country presents; the natural elevation of the hills, over which the road passes, none exceed ten degrees, except some short hollows from one to ten chains in length.

3d. Breadth of the road four rods, the shape twenty-eight feet, with a gradual arch of fifteen inches at least rise in the centre, bedded where necessary with stone or other hard substance, and faced with gravel twenty feet wide, from six to twelve inches thick.

4th. Dimensions of the bridges, twenty-two feet wide in the clear, abutments and piers built of stone laid in lime and sand mortar; those now in a finishing state covered with wood.

5th. The road in its course crosses the river Raritan, seven miles above Brunswick, at the village of Bound Brook, at which place some distance of flat land subject to inundation falls in the track of the road; this part of the road and the bridge is erected, and having been considered a very important difficulty is now happily surmounted. The principal difficulty to be surmounted is the Musconetcong mountain, bordering on the line dividing the counties of Hunterdon and Sussex; this pass, from base to base of the mountain, is about one mile, and has been considered the greatest difficulty in the route of the road, but from the advantage of a break therein the road has been so laid as to come within the degrees of elevation allowed by law, or very nearly.

6th. The first section of the road (eleven miles) to the village of Somerville, the erection of which is now in operation, and nearly completed, will, when finished, cost the company about $3,500 per mile, including all the bridges, which are very numerous, owing to the vicinity of the river Raritan, its branches and their various windings; in the further progress of the road the expense of bridges will be lessened.

7th. Capital now expended, presuming the eleven mile section completed, toll houses built, gates put up, &c., $40,000, being the whole amount of capital now subscribed. In this section the bridges have amounted to nearly half that sum; the shaping and gravelling the residue of the road from Somerville to Easton may be contracted for at from $12 to 1,400 per mile, all small bridges and culverts included. The probable additional subscription to complete the road to Easton will be about $100,000.

8th. Rate of tolls, one cent per mile for one beast.

One cent per mile for every additional beast.

The gross amount of toll, annual expenses, &c., the company are yet ignorant of, not having commenced the receipts of toll; yet the board are well assured, by calculations made, that this section of the board will nett ten per cent. per annum.'

9. The act of the Legislature, and the supplement thereto, requires the completion of the road in ten years from the 28th of November, 1806. The act of incorporation to be void after ninety-nine years from the passing thereof. The act required that, at the end of every ten years, an account of the expenditures upon the said road, and the profits arising therefrom, shall be laid before the Legislature, and that the State of New Jersey may, at any time after the expiration of fifty years from and after the passing of the same, repay the proprietors of said road the amount of the sums expended thereon, with twelve per cent. per annum in addition thereto, deducting the amount of toll received, and, in that case, the said road shall become the property of the State of New Jersey, and be under the control of the Legislature thereof.

For a more particular account of the rates of tolls, and satisfactory information of the substance of the charter, &c., you are referred to the act itself, together with the supplement, copies of which are herewith enclosed.

The great advantage the upper part of the States of New Jersey, Pennsylvania, and the western part of New York, will derive from the completion of this road, when connected with those now building from Easton, in Pennsylvania, to the head waters of the Susquehannah, both in lessening the distance, and facilitating the travelling from the back countries to the tide waters, and their proper markets, the board believes will be evident to every person the least acquainted with the geography of the country, and will, therefore, rank this amongst the first roads of the kind in the country meriting the aid of the Legislature of the Union. Under this impression the board fondly indulges the hope that this establishment will be one of the first to be patronized, and, therefore, with pleasure, they have endeavored to give the best information they were able in answer to the questions proposed.

OCTOBER 28, 1807.

1st. New Brunswick and Trenton united by a turnpike twenty-five miles in length.

2d. None over three degrees.

3d. Four rods, thirty-six feet of which is formed from one to three feet above the natural surface, according to the nature of the soil; and faced with an average of six inches of gravel spread fifteen feet wide.

4th. Stone piers and abutments, and white oak timbers covered with three inch white oak plank, each bridge twenty-eight feet wide; the sluices are covered with flag stones and are thirty feet wide.

5th. None except the sand hills of any serious consequence, and they are cut thirty feet deep in some places, twenty-eight feet wide at the bottom, and sloped sufficient to prevent its caving in.

6th. Land, forming, and gravelling, together with other expenses, about $2,500 per mile.

7th. One week of good weather will complete the whole; amount not ascertained exactly.

For 8th and 9th see the act itself, passed November 14, 1804.

THOMAS HILL, *Agent for the Company.*

AN ACT to incorporate the New Jersey Turnpike Company, with its supplement.

SEC. 1. *Be it enacted by the Council and General Assembly of this State, and it is hereby enacted by the authority of the same*, That George Biddleman, William McCullough, Thomas Stewart, George C. Maxwell, Ralph Hunt, Andrew Howell, George McDonald, John Frelinghuysen, John Campbel, Jacob R. Hardenberg, John Bray, Henry Van Dyke, and John Dennis, Jun. be authorized to receive subscriptions for erecting a turnpike road, four rods wide, beginning in the city of New Brunswick, in Albany or French street, between the bridge and the fork of said street, nearly opposite to the Barrack spring, and next above the house lately occupied by John Parker, deceased, running thence as nearly in a direct line as may be practicable, to Bound Brook village, from thence to Somerville, in the county of Somerset, and from thence, by the most direct practicable route, to the bridge now building across the river Delaware from Philipsburg to Easton; and that they shall give security to the Governor of the State to pay the subscription money, which they shall receive, to the treasurer of the turnpike company, and to perform the other duties required of them by this act, for which services they shall be paid by the turnpike company.

SEC. 2. *And be it enacted*, That such subscriptions shall consist of four thousand shares, of fifty dollars each; that two dollars and fifty cents shall be paid on each share at the time of subscribing, and that as soon as six hundred shares shall be subscribed, the said George Biddleman, William McCullough, Thomas Stewart, George C. Maxwell, Ralph Hunt, Andrew Howell, George McDonald, John Frelinghuysen, John Campbel, Jacob R. Hardenberg, John Bray, Henry Van Dyke, and John Dennis, Jun., or a majority of them, or their survivors, shall call a meeting of the subscribers and stockholders, to be held at Somerville aforesaid, after four weeks' notice in the Trenton and New Brunswick newspapers, and in one of the newspapers printed in the city of New York, to choose a president and seven directors, five of whom shall constitute a board to transact business, and a treasurer to continue in office until the first Tuesday of May then next ensuing; on which day, and also on the first Tuesday in May annually thereafter, there shall be a choice of officers for one year, at such place as the stockholders may, at their last meeting, have appointed; that each stockholder may vote in person or by proxy, and shall have as many votes as he or she may have shares of stock: *Provided, nevertheless*, That no stockholder shall have more than ten votes, although he may have a greater number of shares; that the said president and directors shall be called and known by the name of "The President and Directors of the New Jersey Turnpike Company," and shall have all the powers, rights, and privileges incident to a body politic and corporate for the purposes herein mentioned, for the term of ninety-nine years; and also that they and their successors, by the same name and style, shall be in law capable of suing and being sued, and of purchasing, holding, and conveying any estate, real and personal, for the use of the said corporation: *Provided*, That the real estate so to be holden, shall be such only as may be requisite to promote and attain the objects of this incorporation, and may be relative thereto, which objects are hereby declared to be the erecting and maintaining a good and sufficient turnpike road from New Brunswick to Philipsburgh.

SEC. 3. *And be it enacted*, That the president and directors aforesaid shall have the power to appoint the time and place of all their meetings, and to appoint all such agents and servants as they shall deem necessary for carrying into effect the powers vested by this act in the said company; and if any vacancy or vacancies shall at any time happen in the said office of president, or among the directors, by death, resignation, removal, or otherwise, such vacancy or vacancies shall be filled for the remainder of the year in which they may happen, by such person or persons as the directors for the time being, or the major part of them, may appoint; and that the said president and directors may make such ordinances, by-laws and regulations, relative to their concerns, as they may deem expedient: *Provided*, The same shall not be repugnant to the constitution and laws of this State, or of the United States, which ordinances, by-laws, and regulations, together with all accounts, shall be submitted to the inspection of the stockholders at their annual meeting.

SEC. 4. *And be it enacted*, That Isaac Mickle, Philip I. Schuyler, and Daniel Stewart, be commissioners to lay out said turnpike road, beginning in the city of New Brunswick, in Albany or French street, between the bridge and the fork of said street, nearly opposite the Barrack spring, and next above the house lately occupied by John Parker, deceased, running thence in as direct a line as may be practicable to Bound Brook village, from thence to Somerville, in the county of Somerset, and from thence, by the most practicable route, to the bridge now building across the river Delaware from Philipsburg to Easton, having due regard to the situation and nature of the ground, public convenience, and the interest of the stockholders. Said road shall not pass through, or cross over any burying ground, nor place of public worship, nor dwelling house, without consent of the owner or owners thereof; nor shall it pass through or over any out building of any greater value than three hundred dollars, without such consent; and the said commissioners, or a majority of them, shall within six months thereafter cause an accurate survey of the line of said road, and a map or plot of the said survey, to be correctly laid down on a scale of four inches to the mile, and certify the same under their hands, which they shall file in the Secretary's office of this State, to be entered of record in the said office, a certified copy of said record shall be sufficient and conclusive evidence of said road; and all reasonable charges by the said commissioners for time and expenses shall be paid by the said company. And the said commissioners shall, before they enter upon the duties of their office, take and subscribe an oath or affirmation, faithfully and impartially to execute the same, which oath or affirmation shall be filed with the return of said road: *Provided*, That, in case of the death, resignation, refusal, or inability of either of the said commissioners to fulfil the duties of his or their appointment, that then it shall be lawful for the Governor of this State, or the person administering the Government thereof, to appoint some other disinterested person or persons in his or their place.

SEC. 5. *And be it enacted*, That, in the middle of the said turnpike road, there shall be formed a space or artificial road not less than twenty-eight feet in breadth, the centre of which shall be raised fifteen inches at least above the sides, rising towards the middle by a gradual arch, which artificial road shall be well and sufficiently drained by ditches and subterraneous passages for water a sufficient depth, and the said road shall be sufficiently

bedded with stone or other hard substance, so as to secure a dry and solid foundation for the same at all seasons of the year; and twenty feet thereof shall be faced with gravel or broken stone, so as to form a firm and even surface; and, in its progress, no part of it between the said city of New Brunswick, and the place where the said road shall cross the north branch of the river Raritan, shall rise above an angle of three degrees with the plane of the horizon; and no part of said road between the place where the same shall cross the north branch to the place where the same shall cross the south branch of the river Raritan, shall rise above an angle of four degrees with the plane of the horizon; and in no part thereof from the last mentioned place to the terminating point of said road, shall the same rise above an angle of five degrees with the plane of the horizon; and the said directors shall cause good and sufficient bridges to be erected, where necessary, on the line of said road, to be constructed not less than twenty-two feet in breadth, which road and bridges shall be kept in good and sufficient repair by the said company, and, in case they shall not be so kept, the said corporation, or any of their officers, shall be liable to be proceeded against as in cases of overseers of highways for the neglect of duty; and that, wherever the said road in passing over low grounds or other places, is raised so much at the margin or side of the travelling path, as to render carriages passing thereon liable to be overset, the said company shall cause a good and sufficient railing to be erected and maintained on the sides, so as to prevent horses or carriages from running off.

Sec. 6. *And be it enacted*, That full power and authority be given to the said commissioners, and the said corporation, and to their agents and servants, and to all persons employed by or under them for the purposes contemplated in this act, from time to time, to enter upon and make use of any land which shall be deemed necessary for laying out or making the said road, and for carrying into effect the objects of this law; and also to carry away stone, sand, or gravel, for the use of the said road, subject always to make compensation for all damages thereby occasioned, either by agreement of parties, or by the judgment of indifferent men, chosen by the said company, and the persons who shall have sustained such damages, or as is hereinafter mentioned: *Provided*, That it shall and may be lawful for the said company, their laborers and servants, to quarry, take up, and carry away, or otherwise use at their pleasure, any stone, gravel, sand, or earth, from the bottom of the river Raritan and its branches, or from within the shores or banks thereof, that may be necessary for perfecting the said road, free from any expense or charge whatsoever.

Sec. 7. *And be it enacted*, That if any of the owners of land through which the said road shall pass, shall conceive themselves injured thereby, and not having settled the same agreeably to the provisions of the sixth section of this act, then it shall be lawful for such owners of land to meet at Somerville aforesaid, on thirty days' notice being given in the newspapers printed in New Brunswick and Trenton, and by advertisements signed by the president of the directors, one put up at one of the most public places in New Brunswick, Boundbrook, Somerville, Hunt's mills in Lebanon, in the county of Hunterdon, and Philipsburgh, and to choose one respectable freeholder in the State, not interested, and the said corporation shall also choose one respectable freeholder of the State, not interested, who, in case of their disagreement, shall have power to choose an umpire, and who, together with said umpire, if chosen, or a majority of them, after having taken an oath or affirmation to act impartially and to the best of their knowledge, shall determine, at the expense of the turnpike company, the amount of compensation which shall be paid by the company to such of the applicants, respectively, as they shall conceive to be injured, on which payment the said company shall become seized of the same estate in the lands, tenements, and hereditaments, which the owner or owners held in the same; but if the owner or owners of any land through which the said road shall pass, will not agree to any of the provisions heretofore mentioned, or refuse or neglect to join in any such choice, or shall be *feme coverte*, under age, *non compos mentis*, or out of the State, or in case the men chosen as aforesaid do not decide thereon, then it shall be lawful for one of the justices of the supreme court, upon application of either party, and at the mutual costs and charges of the said corporation and the owners of such land, to direct a special jury of the freeholders of any of the townships in the said county through which the said road shall not run, to be struck before such justice in the manner which special juries are usually struck, who shall view, examine, and survey the said lands, tenements, and hereditaments, and estimate the injury or disadvantage sustained as aforesaid, and shall make an inquisition thereof, under their hands and seals, to be returned to the said justice of the supreme court by the sheriff of the county in which the said inquisition is taken; and it shall be the duty of such sheriff to attend before the said justice, with his books of freeholders, at such place as the said justice shall appoint, upon reasonable notice given to him for that purpose of striking such jury, and also upon like notice to have the said jury upon the premises in question at the time mentioned in such notice, and to administer the oath or affirmation to the said jurors; and the said sheriff and jurors shall be entitled to the like fees, for their services, as are allowed by law in other cases of special juries; and, upon the coming in of such report or inquisition, and the confirmation thereof by the court, and the said directors paying to the owners, respectively, the sums mentioned in such report, in full compensation for the said lands, tenements and hereditaments, privileges, and appurtenances, or for the injury sustained as aforesaid, as the case may be, upon such payment the said company shall become seized in the same estate in the lands, tenements, and hereditaments aforesaid, which the said owners held in the same, and which they shall have taken possession of and paid for as aforesaid, and they, and all who have acted under them, shall be acquitted and freed from all responsibility for and on account of such injury: *Provided*, That *femes covertes*, persons under age, and *non compos mentis*, shall not bear any part of the expenses: *Provided, also*, That the payment or security for payment of damages aforesaid, for lands through which the said road may be laid, to the satisfaction of the person or persons, be made before the company, or any person under their direction, or in their employ, enter upon or break ground in the premises, except surveying and laying out said road, unless the consent of the owner of such land be first obtained.

Sec. 8. *And be it enacted*, That it shall and may be lawful for the said directors to call and demand from the stockholders, respectively, all such sums of money by them subscribed, at such time and in such proportions as they shall see fit, under pain of forfeiture of their shares, and of all previous payments thereon, to the said company.

Sec. 9. *And be it enacted*, That, as soon as the said company shall have completed ten miles of the said road, either at the beginning or terminating point thereof, then it shall be lawful for the directors to give notice to the Governor, or person administering the Government of this State, who shall thereupon forthwith nominate and appoint three commissioners, who shall, at the expense of the corporation, view the same, and report to him, in writing, whether the said road is so far executed in a workmanlike manner, according to the true intent and meaning of this act; and if the said commissioners, or any two of them, report in the affirmative, then it shall be the duty of the Governor, by license, under his hand, to permit the said directors to erect gates and turnpikes across the said road, and to demand and receive toll at the same, at the rates hereinafter specified; and, in like manner, when the remainder of the said road, or any part thereof, shall be made, approved of, and licensed, as aforesaid, to erect other gates and turnpikes, and for passing through the same, to demand and receive toll for each mile of the said road, after the following rates, to wit:

For every carriage, sleigh, or sled, drawn by one beast, one cent.

For every additional beast, one cent.

For every beast, exceeding four, two cents.
For every horse and rider, or led horse, or mule, five mills.
For every dozen of calves, sheep, or hogs, five mills.
For every dozen of horses, mules, or cattle, two cents.

And it shall be lawful for the toll-gatherers to stop any person riding, leading, or driving any horse, cattle, mule, calves, sheep, or hogs, or carriages of burden or pleasure, from passing through the said gates or turnpikes until they shall have respectively paid the toll, as above specified: *Provided*, That nothing in this act shall be construed so as to entitle the said company to demand or receive toll of or from any person passing to or from public worship on the Sabbath day; or to or from any mill to which he may resort for the grinding of grain for his family's use; or horses, carriages, sleighs, or sleds, solely conveying persons to or from a funeral; or any person passing to or from his common business on his farm; or any militiaman passing to or from any training on a muster day appointed by law; or any military officer or soldier, passing or repassing, when called to do duty by the laws of this State or of the United States.

Sec. 10. *And be it enacted*, That no turnpike gate shall be erected, or other obstruction placed on such parts of said road as is at present a highway, and shall be continued as such, between the north branch of Raritan river and the river Delaware, opposite Easton.

Sec. 11. *And be it enacted*, That, before the said company shall receive toll for travelling said road, they shall cause mile-stones or posts to be erected and maintained, one for each and every mile on said road, and on each stone or post shall be fairly and legibly marked the distance the said stone or post is from Brunswick; and shall cause to be affixed and always kept up, at the gates aforesaid, in some conspicuous place, a printed list of the rates of toll which may be lawfully demanded; and also a board, on which shall be printed, in large letters, "*Keep to the right, as the law directs.*"

Sec. 12. *And be it enacted*, That, if any person shall wilfully break, throw down, or deface any of the mile-stones or posts, so erected on said road for the information of the people travelling the same, or shall wilfully tear down or deface any of the printed rates of toll or directions, or shall cut, break down, destroy, or otherwise injure any gates, turnpikes, or bridges that shall be erected in pursuance of this act, or shall forcibly pass the same without having paid the legal toll at such gate or turnpike, such person or persons shall forfeit and pay a fine, not exceeding twenty dollars, besides being subject to an action of damages for the same, to be recovered by the corporation, to their use, with costs of suit. And if any person shall, with his team, carriage, or horse, turn out of said road to pass a gate or gates on private ground adjacent thereto, and again enter on said road, with intent to avoid the toll due by virtue of this act, such person or persons shall forfeit and pay three times as much as the legal toll would have been for passing through said gates, to be recovered by the said corporation, for the use thereof, in an action of debt, with costs of suit.

Sec. 13. *And be it enacted*, That if any toll-gatherer shall unnecessarily delay or hinder any traveller passing at any of the gates, or shall receive more toll than is by this act established, he shall for every such offence forfeit and pay the sum of twenty dollars, with costs of suit, to be prosecuted by and recovered for the sole use of the person so unreasonably hindered or defrauded.

Sec. 14. *And be it enacted*, That the shares in said turnpike road shall be taken, deemed, and considered as personal property, and be transferred in such manner as the directors may appoint: *Provided*, That if the said company shall not commence their operations within two years after the passing of this act, or shall not within one year thereafter complete at least two miles of said road from New Brunswick, and two miles across the Musconetkong mountain, commencing on the west side thereof, or shall not continue to make yearly the same quantity of road from each place as aforesaid, or shall not within seven years afterwards complete the said road according to the intent and meaning of this act, then and in either of these cases this act shall cease, be void and of no effect.

Sec. 15. *And be it enacted*, That all drivers of carriages, sleighs, or sleds, of all kinds, whether of burden or pleasure, or persons on horseback using the said road, shall keep their horses, carriages, sleighs or sleds on the right hand of the said road, in the passing direction, leaving the other side of the road free and clear for other carriages and persons on horseback to pass; and if any person shall offend against this provision, such person shall forfeit and pay the sum of two dollars to any person who shall be obstructed in their passage, and will sue for the same, and shall also be subject to an action of damages for every such offence, to be recovered with costs of suit.

Sec. 16. *And be it enacted*, That at the end of every ten years an account of the expenditures upon the said road, and the profits arising therefrom, shall be laid before the Legislature, and that the State of New Jersey may at any time, after the expiration of fifty years from and after the passing of this act, repay the proprietors of said road the amount of the sums expended thereon, with twelve per cent. per annum, in addition thereto, deducting the amount of toll received, and in that case the said road shall become the property of the State of New Jersey, and be under the control of the Legislature thereof, any thing in this act contained to the contrary notwithstanding.

A. Passed at Trenton, February 27, 1806.

State of New Jersey. A supplement to the act entitled "An act to incorporate the New Jersey Turnpike Company," passed the twenty-seventh day of February, one thousand eight hundred and six.

1. *Be it enacted by the Council and General Assembly of this State, and it is hereby enacted by the authority of the same*, That it shall and may be lawful for the commissioners, named in the act for incorporating the New Jersey Turnpike Company, to lay the road of a less width than four rods, where, in passing through any town or village, the situation of buildings erected therein may not admit of such width, any thing in the first section of the before recited act to the contrary notwithstanding.

2. *And be it enacted*, That it shall and may be lawful for the said New Jersey Turnpike Company to commence their operations in erecting and making the road from New Brunswick to the bridge across the river Delaware, opposite Easton, at New Brunswick, and to progress therein towards Easton, at such times, and in such parts as to them may be most expedient, any thing in the proviso in the fourteenth section of the act, to which this is a supplement, to the contrary in any wise notwithstanding.

3. *And be it enacted*, That if the said company shall not complete said road within ten years from the passing of this act, then this act, and the said act entitled an act to incorporate the New Jersey Turnpike Company, passed the twenty-seventh day of February, one thousand eight hundred and six, shall cease, be void, and of no effect.

Passed at Trenton, November 28, 1806.

TURNPIKES OF PENNSYLVANIA.

SIR: PHILADELPHIA, *October* 28, 1807.

We have the honor of handing you a report on the formation of the Germantown and Perkiomen Turnpike Road. We trust it will be acceptable and useful at the Treasury, and remain

Very respectfully, sir, your obedient servant,

WILLIAM DARY, SAM. W. FISHER. } *Committee.*

Gen. WM. MACPHERSON.

PHILADELPHIA, *October* 28, 1807.

The committee, appointed the 29th August, 1807, to attend to an application from the Secretary of the Treasury of the United States, report:

That, being duly impressed by the importance of the object in view, they present the following detail of information and remarks, as replies to the inquiries contained in the circular from the Treasury, so far as relates to artificial roads.

First. Points united and their distances.

Answer. The Germantown and Perkiomen Turnpike Road begins at Vine street, in Philadelphia, and terminates at Perkiomen bridge, being twenty-five and a quarter miles in extent, and is the whole distance originally contemplated by the subscribers, and specified in the act of incorporation. It was begun in a section of five miles from Philadelphia, in the month of August, 1801, and the whole was completed in the month of November, 1804. It passes through Germantown, over Chesnut Hill, by Hilner's marble quarries, and various lime kilns, through Hickory town, and Evansburgh, on the direct road to Reading. Two of the turnpike roads have been made, branching off from this main line since its completion, by two different companies, sanctioned by acts of the Legislature; the first, styled the Cheltenham and Willow Grove Road, diverges at a distance of about three miles and a half from Vine street, and is completed through Milestown to Shoemaker's town, and to the Willow Grove; in all a distance of ten miles on the old road to New York. The second, styled the Chesnut hill and Spring house turnpike, diverges at a distance of nine miles and a half from Vine street, and is completed through White marsh to the Spring House Tavern, a distance of seven and a half miles.

Second. Elevation of the hills over which the road passes; greatest angle of ascent which has been allowed.

Answer. The following is a statement of the principal elevations, *i. e.* Nagle's hill, 4° 58″; Creesham hill, 5° 35″; Chesnut hill, 4° 5″ to 4° 13″; Coulston's hill, 6° 29″; Hickorytown hill, 5°; Five mile run hill, 4°; Custer's hill, 4° 52″; Skippack hill, 4° 44″; and Perkiomen hill, 5° 37″.

The law limits the greatest angle of ascent to four degrees, and in no case is it exceeded. Embankments have been raised in deep valleys to assist in producing this angle, and the expense has varied according as materials could be procured.

Third. Breadth, form, and materials of the artificial road.

Answer. The breadth is fixed by law to be not more than sixty, nor less than fifty feet, of which twenty-eight feet are required to be made (and are so made) as an artificial road, with a convexity of fifteen inches on the said twenty-eight feet. The natural road being surveyed and levelled, the breadth of twenty-eight feet is formed with the aforementioned convexity, leaving a shoulder or abutment of the natural soil on each side of about twelve or fourteen inches. Good gravel, well sifted or riddled, is laid on eighteen inches thick, preserving the greatest equality of surface possible. Where gravel cannot be procured, pebbles, stone, and gravel from the sides and beds of rivers, broken to an equal and small size, are found to answer well. Lastly, hard iron, or other *solid* stone, is a principal material, and these are laid on twelve inches thick. First, a stratum of six inches deep, broken small enough to pass through a ring of five inches diameter, on which the remaining six inches of stone, broken to a smaller size to pass through a ring of two and a half inches, are laid with the greatest evenness. Here we would observe that experience convinces us that, if the whole body of stone was to be broken down to the smallest size, the road would be more durable, and of an even surface; the larger stones will, in time, work up to the surface by the action of heavy carriages, and prove highly detrimental. It is also of great importance that when stone is used, it should be all, as nearly as possible, of the same quality; hard and soft stones mixed, will always make a bad road; the hard stones resisting friction, curve holes, and pits, and an uneven surface all around them; the water is there retained, and the soft materials being soon ground to earth, produce the greatest injury and inconvenience. It may be added that bad materials well applied, and well taken care of, will keep a better road than good materials, ill applied, and neglected, can do.

Side or summer roads are found a very acceptable accommodation to travellers, and as they save the wear and considerable expense of the artificial road, they may be deemed, on the whole, economical, provided, however, that good and sufficient drains be kept always open on each side, so that no water remain on the surface of the artificial road; this is an essential object of attention at all times. Nothing tends more to the preservation, and, therefore, to decrease the expense of repairing artificial roads, than the use of broad wheels for carriages of great burden, as those employed in conveying marble, iron, timber, &c. and, to encourage the introduction of them, the tolls should be reduced in proportion, as the breadth of the wheels is, to a reasonable extent, increased.

Fourth. Bridges, their dimensions, materials, and construction.

Answer. On this road no bridges of consequence have been constructed, the tract of the old State road having been preserved, little more has been done than to repair, widen, and generally to improve the bridges that had been previously erected. A great number of culverts, and small bridges, over small runs and creeks, have been erected generally with stone, the larger size with stone piers, and covering of the best oak plank three inches thick. In building bridges it is found, by experience, that every stone of the main walls and arches, should be squared, and well bound together; where rough quarry stones have been used, and, as is too often the case, the interstices filled up with rubbish, a few years of frost and floods, and the constant jarring and concussions of heavy loads passing over them, shiver these disjointed structures, and prove that parsimony, in the original construction, is, in fact, the grossest extravagance.

Fifth. Particular obstructions and difficulties surmounted, or to be encountered.

Answer. No obstructions or difficulties, but such as are before referred to, did occur, except from the prejudice and capricious conduct of obstinately ignorant persons living near to the line of the road, who raised very serious opposition, and, by every possible means, endeavored to thwart and counteract the legal operations of the Turnpike Company; but firm conduct on the part of the managers, and strictly enforcing the law, together with the experience of the benefit received, are daily diminishing this evil, and producing acquiescence and approbation.

Sixth. The expenses per mile, and in the whole, and as far as practicable, of every component part of the work in all its details, viz: forming the bed of the road, cutting hills, quarrying, transporting, breaking, laying stone or gravel, &c.

Answer. The total average expense of this road amounts to $11,287 13 per mile. For the detail, see papers marked A, B, C, and D.

Seventh. The capital already expended, vested, or wanted for completing the work.

Answer. The total of capital expended on the 25¼ miles, amounts to $285,000.

Eighth. Rate and gross amount of tolls; annual expenses of repairs and contingencies; annual net income.

Answer. The rate of tolls is fixed by the act of incorporation; the gross amount annually since the completion of the whole road has been as follows, viz:

From the first Monday in November, 1804, to the first Monday in November, 1805,	$18,591 38
From the first Monday, 1805, to the first Monday in November, 1806,	19,019 96

Since the road was first completed it has been found necessary to expend a very large sum in improving and repairing (from defects in the original structure) the road, bridges, and culverts.

The permanent expenses may be rated as follows:

1st. Repairs necessary to be made, arising from the common use and wear of the road, per annum,	$4,500
2d. Eight gate keepers; five at a salary of $500 each; one at $450, and two at $350 each,	3,650
3d. The general superintendent; a man of intelligence, respectability, and great firmness,	800
4th. The treasurer and secretary who gives ample security to the company, and is under the control of the President and managers,	600
5th. Stationary expenses of meetings and journeys of the managers, ground rents, and incidentals,	400
	$9,950

Lastly. The greatest embarrassment and injury to this company results from the jealous restrictions of the act of incorporation; they are, indeed, equally injurious to the community as to the company. The limitation for taking toll *only*, for the exact distances travelled, sets *exact* calculation at defiance in most cases, and causes, therefore, constant litigation, and the most vexatious disputes; and it is, under such a law, very difficult, if not absolutely impracticable, to provide a complete remedy for such an evil, and the only one that can prove effectual must be afforded by the Legislature, compelling every person passing through a toll gate, to pay a certain toll without regard to distance; in which case the *average* rate of toll would be as light, on the public at large, as at present, and litigation would cease. The dividends on the capital expended, have, for the two years after the completion of the road, been as follows, viz: Four half yearly dividends, at $1 75 per cent. only; this proves that the company are entitled to some relief from the Legislature.

WILLIAM DARY, } *Committee.*
SAM. W. FISHER, }

A.

Cost of first section of five miles.

Forming, shouldering, and gravelling 952 7/10 perches,	$20,850 29	
Gravel,	1,379 30	
Screening gravel,	11,752 63	
Hauling to the road from gravel pits,	2,565 79	
Making 46 perches stone road on part of gravel road,	613 80	
		$37,161 81
Forming, shouldering, and making 647 3/10 perches of stone road,	17,918 94	
Expended in improving and perfecting the road after the contractors,	5,378 22	
Bridge at five mile run, with one arch,	1,899 15	
Three culverts,	538 16	
Three toll-houses and gates,	2,614 99	
Lowering Nagle's hill,	905 88	
Quarrying and other expenses, exploring the country for stone and gravel,	654 42	
Tools, and repairing the same,	1,846 06	
Surveying, &c.,	121 67	
Purchase of a lot, and a strip of land, for the purpose of straightening the road,	203 95	
Expenses of the board at their meetings, and committee's expenses to Lancaster,	102 66	
Printing and stationary,	227 34	
Salary to superintendent,	900 00	
Secretary's salary and office rent,	555 00	
Five mile-stones, and hauling,	46 00	
Fee to counsel and seal for the company,	30 00	
Compensation to Dr. Logan for opening extra quarries on his land,	100 00	
John Mason for inspecting laborers,	131 00	
Ditching and draining, and making summer road,	659 98	
Fence round the gravel pits,	39 72	
Pump at the gravel pits,	7 40	
Repairing bridge in third street,	37 18	
Compensation to Charles Browne, for injury done him by changing the direction of the road,	46 35	
Labor and other incidental expenses,	461 29	
		35,425 36
		$72,587 17

B.

Cost of second section.

Forming, shouldering, and making 1,600 perches of stone road, contractors supplying materials,		$32,855 60
Levelling, on this section,		6,852 10
Culverts and water courses,		1,044 83
Expended in improving and perfecting sundry parts of the road, after the contractors,		8,532 97
Two toll-houses and gates,		904 13
Tools, and repairing the same,		984 45
Stationary and advertising,	$74 13	
Surveying,	256 93	
		331 06
Compensation to Andrew Heath for his services,		200 00
Secretary's salary and office rent,		550 00
Superintendent's salary,		560 00
Expenses of the board and committees,		33 55
Compensation for damages done to the property of sundry persons by blowing rocks in Germantown,		147 00
Incidental expenses,		82 97
		$53,078 66

C.

Cost of third section.

Levelling, forming, shouldering, and making 960¼ perches of stone road,	$23,685 75
Forming, shouldering, and making 620 95/100 perches of stone road,	11,177 10
Levelling the last mentioned,	4,706 47
Building dry walls,	298 68
Expended in improving and perfecting parts of the section, after the contractors,	1,813 91
Purchase of a small piece of land on this section to accommodate and straighten the road,	200 00
Two toll-houses, gates, &c.	1,461 50
Superintendent's salary,	842 00
Secretary's, &c.	595 83
Repairs at Wissahickon bridge, built by the county commissioners,	376 01
Tools, and repairing,	627 63
Printing, &c.,	92 17
Surveyor on this section, his account,	160 81
Expenses of the board and committees at their meetings and journeys to view the road, journeys of the latter to Lancaster, carriage hire, &c.,	818 47
Proportion of a wagon with broad wheels and cylinder, built in hopes of introducing broad wheel carriages,	230 81
Plymouth bridge, one arch and culverts,	5,181 75
Fees to counsel, and other incidental expenses,	212 98
	$52,481 87

D.

Cost of fourth and fifth sections.

Levelling, forming, shouldering, and stoning 10¼ miles,	$76,949 14	
Ditching and gravelling,	1,976 26	
		$78,925 40
Mason's work, building six bridges and fourteen culverts,	12,908 08	
Filling bridges and culverts, and digging a foundation at Stony Run bridge,	3,206 70	
Boards, scantling, plank, and timber,	2,719 13	
Carpenter's work,	1,031 19	
Smith's work,	267 49	
Nails, paint, oil, &c.,	116 69	
		20,249 28
Purchase of two strips of land to straighten the road,	32 00	
Dry walls,	161 92	
Surveying and draughts,	186 12	
Services of assistant superintendent,	434 30	
Mile-stones, at $8,	80 00	
Digging a small canal in St. Clair's meadow,	64 50	
Labor, hauling, ploughing the road, rolling the road, making side drains, removing and putting up fences, setting mile-stones, liquors for workmen at raising bridges, hire and repair of log-wagon, fees to counsel, and measuring expenses, &c.,	2,648 46	
Toll-house, gate, &c.,	720 78	
Printing, &c.,	27 00	
Improving and perfecting parts of the road after contractors,	1,162 58	
Salaries of superintendent and Secretary,	1,626 67	
		7,144 33
Expenses of the board and committees at their meetings, and on their journeys at sundry times to view the road,	369 74	
Expenses of commissioners appointed by the Governor to view the sections,	33 79	
Incidental,	129 76	
		533 29
		$106,852 30

AN ACT to enable the Governor of this Commonwealth to incorporate a company to make an artificial road from the city of Philadelphia, through Germantown, to the ten-mile stone on Chesnut Hill, and from thence to the new stone bridge over Perkiomen creek, in the county of Montgomery.

SEC. 1. *Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania, in General Assembly met, and it is hereby enacted by the authority of the same,* That Benjamin Chew, Jr., Casper W. Hains, Matthew Huston, Samuel Betton, John Fromberger, and Joseph P. Norris, be, and they are hereby, appointed commissioners to do and perform the several duties hereinafter mentioned, that is to say: They shall, on or before the first day of May next, procure two books, and in each of them enter as follows: "We, whose names are hereto subscribed, do promise to pay to the president, managers, and company of the Germantown and Perkiomen turnpike road, the sum of $100 for every share of stock in the said company set opposite to our respective names, in such manner and proportions as shall be determined by the said president and managers, in pursuance of an act of the General Assembly of this Commonwealth, entitled 'An act to enable the Governor of this Commonwealth to incorporate a company for making an artificial road from the city of Philadelphia, through Germantown, to the ten-mile stone on Chesnut Hill, and from thence to the new stone bridge over Perkiomen creek, in the county of Montgomery.' Witness our hands, the —— day of ——, in year of our Lord 1801." And shall give notice in three of the public newspapers in the city of Philadelphia, (one whereof shall be in the German language,) for one calendar month at least, of the times when, and places where, the said books will be open to receive subscriptions of stock for the said company, at which times and places three of the said commissioners shall attend, and shall permit and suffer all persons who shall offer to subscribe in the said books, which shall be kept open for the purpose, at least 4 hours in every juridical day, for the space of three days, if three days shall be necessary; and if, at the expiration of the said three first days, the said books shall not have 500 shares therein subscribed, the said commissioners may adjourn from time to time, until the said number of shares shall be subscribed, of which adjournment public notice shall be given, in at least two public papers, and when the said subscriptions in the said books shall amount to the number aforesaid, the same shall be closed: *Provided, always,* That every person offering to subscribe in the said books in his own name, or in the name of any other person, shall previously pay to the attending commissioners $15 for every share to be subscribed, out of which shall be defrayed the expense attending the taking such subscriptions and other incidental charges, and the remainder shall be deposited in the bank of Pennsylvania, for the use of such corporation, as soon as the same shall be organized, and the officers chosen, as hereinafter mentioned.

SEC. 2. *And be it further enacted by the authority aforesaid,* That when forty persons or more shall have subscribed 250 shares or more of the said stock, the said commissioners may, or when the whole number of shares aforesaid shall be subscribed, they shall certify under their hands and seals, the names of the subscribers, and number of shares subscribed by each subscriber, to the Governor of this Commonwealth; whereupon he shall, by letters patent, under his hand and the seal of the State, create and erect the subscribers, and if the said subscription be not full at the time, then also, those who shall thereafter subscribe to the number aforesaid, into one body politic and corporate, in deed, and in law, by the name, style, and title of "The President, Managers, and Company of the Germantown and Perkiomen Turnpike Road," and by the said name the said subscribers shall have perpetual succession, and all the privileges and franchises incident to a corporation, and shall be capable of taking and holding their said capital stock, and the increase and profits thereof, and of enlarging the same, from time to time, by new subscriptions, in such manner and form as they shall think proper, if such enlargement shall be found necessary to fulfil the intent of this act; and of purchasing, taking, and holding, to them and their successors and assigns, in fee simple, and for any lesser estate, all such lands, tenements, hereditaments, and estate, real and personal, as shall be necessary to them in the prosecution of their works; and of suing, and of being sued; and of doing all and every other matter and thing, which a corporation or body politic may lawfully do.

SEC. 3. *And be it further enacted by the authority aforesaid,* That the commissioners hereinbefore named, shall, as soon as conveniently may be, give thirty days' notice in three public newspapers in Philadelphia, (one whereof shall be in the German language,) of the time and place by them appointed, for the said subscribers to meet, in order to organize the said corporation, and to choose, by a majority of votes of the said subscribers, by ballots to be delivered in person or by proxy duly authorized, one president, twelve managers, one treasurer, and such other officers as shall be deemed necessary to conduct the business of the said company, until the second Monday in November next, and until like officers shall be chosen; and may make such by-laws, rules, orders, and regulations, as do not contravene the constitution and laws of this Commonwealth, and may be necessary for the well-governing the affairs of the said company: *Provided, always,* That no person shall have more than five votes at any election, or in determining any question arising at such meeting, whatever number of shares he may be entitled to; and that each person shall be entitled to one vote for every share by him held under the said number.

SEC. 4. *And be it further enacted by the authority aforesaid,* That the said company shall meet on the second Monday of November, in every year, at such place as shall be fixed by their by-laws, for the purpose of choosing such other officers as aforesaid, for the ensuing year, in manner aforesaid, and at such other times as they shall be summoned by the managers, in such manner and form as shall be prescribed by their by-laws, at which annual or special meetings they shall have full power and authority to make, alter, or repeal, by a majority of votes, in manner aforesaid, all such by-laws, rules, orders, and regulations, made as aforesaid, and to do and perform any other corporate act.

SEC. 5. *And be it further enacted by the authority aforesaid,* That the president and managers, first chosen as aforesaid, shall procure certificates for all the shares of the stock of the said company, and shall deliver one such certificate, signed by the president, and countersigned by the treasurer, and sealed with the common seal of the said corporation, to each person, for every share by him subscribed and held, he paying fifteen dollars for each share; which certificate shall be transferable at his pleasure, in person, or by attorney duly authorized, in the presence of the president or treasurer, subject, however, to all payments due, or to grow due thereon. And the assignee holding any certificate, having first caused the assignment to be entered in a book of the company to be kept for the purpose, shall be a member of the corporation; and, for every certificate assigned to him as aforesaid, shall be entitled to one share of the capital stock, and of all the estate and emolument of the company, and to vote as aforesaid at the meetings thereof.

SEC. 6. *And be it further enacted by the authority aforesaid,* That the said president and managers shall meet at such times and places as shall be ordained by their by-laws; and, when met, seven members shall form a quorum, and who, in the absence of the president, may choose a chairman, and shall keep minutes of all their transactions, fairly entered in a book; and a quorum being formed, they shall have full power and authority to appoint all such surveyors, engineers, superintendents, and other artists and officers, as they shall deem necessary to carry on their intended works, and to fix their salaries and wages; to ascertain the times when, and manner and proportion in which, the stockholders shall pay the moneys due on their respective shares; to draw on the Bank of Pennsylvania for all moneys, as shall have been so as aforesaid deposited, necessary to pay the salaries or wages of persons by them employed, and for the materials provided; which drafts shall be signed by the President, or, in

his absence, by a majority of a quorum, and countersigned by their treasurer; and generally to do all such other acts, matters, and things, as by this act, and by the by-laws, rules, orders, and regulations of the company, they shall be authorized to do.

SEC. 7. *And be it further enacted by the authority aforesaid*, That if, after thirty days' notice, in three of the public newspapers printed in the city of Philadelphia, of the time and place appointed for the payment of any proportion or dividend of the said capital stock, in order to carry on the work, any stockholder shall neglect to pay such proportion or dividend at the place appointed, for the space of thirty days after the time so appointed, every such stockholder, or his assignee, shall, in addition to the dividend so called for, pay after the rate of five per cent. per month, for delay of such payment; and if the same, and the said additional penalty, shall remain unpaid for such space of time as that the accumulated penalties shall become equal to the sums before paid in part, and on account of such shares, the same shall be forfeited to the said company, and may and shall be sold to any person or persons willing to purchase, for such price as can be obtained for the same.

SEC. 8. *And be it further enacted by the authority aforesaid*, That the said road shall be made in, over, and upon, the bed of the present road, beginning at the intersection of Third street and Vine street, in the city of Philadelphia, and extending through Germantown to the ten-mile stone on the top of Chesnut hill, and from thence to the new stone bridge over Perkiomen creek, in the county of Montgomery, as nearly as may be, consistently with economy and utility: *Provided always*, that no surveyor, superintendent, artist, or other person or persons, employed by the said company to lay out the said road, shall enter upon, or go through, any land or lands belonging to any person or persons, without first obtaining permission of the owner or owners thereof.

SEC. 9. *And be it further enacted by the authority aforesaid*, That the said president, managers and company, shall cause a road to be laid out, of not less than fifty nor more than sixty feet in width, in such manner as that the present buildings on said road may not be injured; and at least twenty-eight feet thereof to be made an artificial road, bedded with wood, stone, gravel, or any other hard substance, well compacted together, and of sufficient depth to secure a solid foundation to the same; and the said road shall be faced with gravel or stone, pounded, or other small hard substance, in such manner as to secure a firm, and, as near as the materials will admit of it, an even surface, and so nearly level in its progress as that it shall in no place rise or fall more than will form an angle of four degrees with a horizontal line; and shall forever hereafter maintain and keep the same in good and perfect order, from the city of Philadelphia, by the route or track aforesaid, to the ten-mile stone on the top of Chesnut hill, and from thence to the new stone bridge over Perkiomen creek, in the county of Montgomery; and the said president, managers, and company, shall have power to erect permanent bridges over all the waters crossing the said road.

SEC. 10. *And be it further enacted by the authority aforesaid*, That, so soon as the said president, managers, and company, shall have perfected the said road from the city of Philadelphia to the five-mile stone on the Germantown road, and also, when they shall have completed the succeeding five miles, they shall give notice thereof to the Governor of the commonwealth, who shall, thereupon, forthwith nominate and appoint three disinterested and skilful persons to view and examine the same, and report to him, in writing, whether the said road is so far executed in a masterly and workmanlike manner, according to the true intent and meaning of this act; and if their report shall, in either case, be in the affirmative, then the Governor shall, by license under his hand and the lesser seal of the commonwealth, permit and suffer the said president, managers, and company, to erect and fix so many gates or turnpikes, upon and across the said road, as will be necessary and sufficient to collect the tolls and duties, hereinafter granted to the said company, from all persons travelling on the same, with horses, cattle, carts, and carriages.

SEC. 11. *And be it further enacted by the authority aforesaid*, That, when the said company is licensed in manner aforesaid, it shall and may be lawful for them to appoint such and so many toll-gatherers as they shall think proper, to collect and receive of and from all and every person and persons, using the said road, the tolls and rates herein after mentioned, and to stop any person riding, leading, or driving, any horses, cattle, hogs, sheep, coach, coachee, sulkey, chair, chaise, phaeton, cart, wagon, wain, sleigh, sled, or any other carriage of burden or pleasure, from passing through the said turnpikes, until they shall respectively have paid the same; that is to say: for every five miles in length of the said road, completed and licensed as aforesaid, the following sums of money, and so in proportion for any lesser distance, or for any greater or lesser number of sheep, hogs, or cattle—to wit: for every score of sheep, 6 cents; for every score of hogs, 6 cents; for every score of cattle, 12 cents; for every horse and his rider, or led horse, 3 cents, for every sulkey, chair, or chaise, with one horse and two wheels, 6 cents, and with two horses, 9 cents; for every chariot, coach, phaeton, or chaise, with two horses, and four wheels, 12 cents; for either of the carriages last mentioned, with four horses, 20 cents; for every other carriage of pleasure, under whatever name it may go, the like sums according to the number of wheels and horses drawing the same; for every stage wagon, with two horses, 12 cents; and for every such wagon with four horses, 20 cents; for every sleigh, 3 cents for each horse drawing the same; and for every sled, 2 cents for each horse drawing the same; for every cart or wagon whose wheels do not exceed the breadth of four inches, 3 cents for each horse drawing the same; for every cart or wagon, whose wheels shall exceed in breadth four inches, and not exceed seven inches, 3 cents for every horse drawing the same; for every cart or wagon, the breadth of whose wheels shall be more than seven inches, and not more than ten inches, or, being of the breadth of seven inches, shall roll more than ten inches, 2 cents for every horse drawing the same; for every cart or wagon, the breadth of whose wheels shall be more than ten inches, and not exceed twelve inches, or being ten inches, shall roll more than fifteen inches, 1 cent for every horse drawing the same; for every cart or wagon, the breadth of whose wheels shall be more than twelve inches, 1 cent for every horse drawing the same. And if any person or persons shall represent to the said company, or any of their officers, that he, she, or they have travelled a less distance than he, she, or they have actually travelled along the said road, with intent to defraud the said company of its toll, or any part thereof, such person or persons shall, for every such offence, forfeit and pay to the use of said company the sum of sixteen dollars; and if any toll-gatherer shall demand and receive toll for a greater distance than the person of whom such toll is demanded shall have travelled along the said turnpike road, or shall demand and receive greater toll from any person or persons than such toll-gatherer is authorized to demand and receive by virtue of this act, such toll-gatherer shall forfeit and pay the sum of twenty dollars, for every such offence, to the use of the overseers of the poor of the township in which the forfeiture is incurred; and for the payment of which the said company shall be responsible.

SEC. 12. *And be it further enacted by the authority aforesaid*, That no wagon or other carriage with four wheels, the breadth of which wheels shall not be four inches, shall be drawn along the said road between the first day of November and the first day of May following in any year, with a greater weight thereon than two and a half tons, or with more than three tons the residue of the year; that no such carriage, the breadth of whose wheels shall not be seven inches, or being six inches or more, shall not roll at least ten inches, shall be drawn along the said road between the said first days of November and May, with more than three and a half tons, or with more than four tons during the residue of the year; that no such carriage, the breadth of whose wheels shall not be ten inches

or more, or being less, shall not roll at least twelve inches, shall be drawn along the said road between the first days of November and May, with more than five tons, or with more than five and a half tons during the residue of the year; that no cart or other carriage with two wheels, the breadth of whose wheels shall not be four inches, shall be drawn along the said road with a greater weight thereon than one and a quarter tons, between the said first days of November and May, or with more than one and a half tons during the residue of the year; that no such carriage, whose wheels shall not be the breadth of seven inches, shall be drawn along the said road with more than two and a half tons, between the first days of November and May, or with more than three tons during the residue of the year; that no such carriage whose wheels shall not be of the breadth of ten inches, shall be drawn along the said road between the said first days of November and May, with more than three and a half tons, or with more than four tons during the residue of the year; that no greater weight than seven tons shall be drawn along the said road in any carriage whatever, between the said first days of November and May, nor more than eight tons during the residue of the year; that no cart, wagon, or carriage of burden whatsoever, whose wheels shall not be of the breadth of nine inches, shall be drawn or pass in or over the said road or any part thereof, with more than six horses, nor shall more than eight horses be attached to any carriage whatsoever, used on the said road. And if any wagon or other carriage, shall be drawn along the said road by a greater number of horses, or with a greater weight than is hereby allowed, the owner or owners of such carriage shall forfeit and pay four times the customary toll to the use of the company: *Provided, always*, That it shall and may be lawful for the said company, by their by-laws, to alter any or all of the regulations herein contained, respecting the burdens on carriages to be drawn over the said road, and to substitute other regulations, if upon experience such alterations should be found conducive to the public good: *Provided, always*, That such regulations shall not lessen the burdens of carriages above described.

Sec. 13. *And be it further enacted by the authority aforesaid*, That all such carriages as aforesaid, to be drawn by oxen in the whole, or partly by horses and partly by oxen, two oxen shall be estimated as equal to one horse in charging all the aforesaid tolls, and every mule is equal to one horse.

Sec. 14. *And be it further enacted by the authority aforesaid*, That if the said company shall neglect to keep the said road in good and perfect order, for the space of five days, and information thereof shall be given to any justice of the peace of the neighborhood, within the county where the repair ought to be made, such justice shall issue a precept to be directed to any constable, commanding him to summon three disinterested persons, to meet at a certain time in the said precept to be mentioned, at the place in said road which shall be complained of, of which meeting notice shall be given to the keeper of the gate or turnpike nearest thereto within the said county, and the said justice shall, at such time and place, on the oaths or affirmations of the said persons, inquire whether the said road, or any part thereof, is in such good and perfect order and repair as aforesaid, and shall cause an inquisition to be made under the hands of himself and a majority of the said persons, and if the said road shall be found by the said inquisition to be out of order and repair, contrary to the true intent and meaning of this act, the said justice shall certify and send one copy of the said inquisition to each of the keepers of the turnpikes or gates, between which such defective place shall be, and from thenceforth the tolls hereby granted to be collected at such turnpikes or gates, shall cease to be demanded, paid, or collected, until the said defective part or parts of the said road shall be put in good and perfect order and repair as aforesaid. And if the same shall not be so put into good and perfect order and repair before the next general court of quarter session of the peace, to be held for the county in which the defect is proved to be, the aforesaid justices shall certify and send a copy of the inquisition aforesaid to the justices of the said court, and the said justices shall, thereupon, cause process to issue, and bring in the body or bodies of the person or persons intrusted by the company with the care and superintendence of such part of the said road as shall be so found defective, and shall proceed upon such inquisition in the same manner and form as upon indictments found by the grand inquest for the body of the county against supervisors of the highways for neglect of their duty; and if the person or persons intrusted by the said company as aforesaid, shall be convicted of the offence by the said inquisition charged, the said court shall give such judgment, according to the nature and aggravation of the neglect, as, according to right and justice, would be proper in the case of supervisors of the highways neglecting their duties; and the fines and penalties so to be imposed, shall be recovered in the same manner as fines for misdemeanors are usually recovered in the said court, and shall be paid to the supervisors of the highways of the township wherein the offence was committed, to be applied to repairing the public roads within such township.

Sec. *And be it further enacted by the authority aforesaid*, That if any person or persons whomsoever, owning, riding in, or driving, any sulkey, chair, chaise, phaeton, cart, waggon, wain, sleigh, sled, or other carriage of burden or pleasure, or owning, riding, leading, or driving, any horse, mare, gelding, hogs, sheep, or other cattle, shall therewith pass through any private gates or bars, or along or over any private passage, way, or other ground, near to or adjoining any turnpike or gate erected, or which shall be erected in pursuance of this act, with an intent to defraud the company and avoid the payment of the toll or duty for passing through any such gate or turnpike; or if any person or persons shall with such intent, take off, or cause to be taken off, any horse, mare, or gelding, or other cattle, from any sulkey, chair, chaise, phaeton, cart, wagon, wain, sleigh, sled, or other carriage of burden or pleasure, or practise any other fraudulent means or device, with the intent that the payment of any such toll or duty may be evaded or lessened, all and every person or persons, in all, or every, or any, of the ways or manners aforesaid offending, shall, for every such offence respectively, forfeit and pay, to the president, managers, and company, of the Germantown and Perkiomen Turnpike Road, the sum of $10, to be sued for and recovered with costs of suit, before any justice of the peace, in like manner, and subject to the same rules and regulations as debts under twenty pounds may be sued for and recovered: *Provided, always*, That if any person or persons shall be prosecuted under this section of the act, and the said prosecution shall not be sustained on the part of the prosecutors, then, and in such case, the person or persons prosecuted as aforesaid, shall receive from the company the sum of $10, in lieu of damages arising from delay and a vexatious prosecution, recoverable as other fines under this act.

Sec. 16. *And be it further enacted by the authority aforesaid*, That the president and managers of the said company shall keep fair and just accounts of all moneys received by them from the said commissioners, and from the subscribers to the said undertaking on account of the several subscriptions, and of all penalties for delay in the payment thereof, and of the amount of the profits on the shares which may be forfeited as aforesaid, and also all moneys by them expended in the prosecution of their said work, and shall once at least in every year submit such accounts to a general meeting of the stockholders until the said road shall be completed, and until all the costs, charges, and expenses of effecting the same shall be fully paid and discharged, and the aggregate amount of such expenses shall be liquidated and ascertained; and if, upon such liquidation, or whenever the capital stock of the said company shall be nearly expended, it shall be found that the said capital stock will be insufficient to complete the said road according to the true intent and meaning of this act, it shall and may be lawful for the said president, managers, and company, at a stated or special meeting to be convened according to the provisions of this act, or their own by-laws, to increase the number of shares to such extent as shall be deemed sufficient to accomplish the

work, and to receive and demand the moneys subscribed for such shares in like manner, and under the like penalties as are herein before provided for the original subscriptions, or as shall be provided by their by-laws.

SEC. 17. *And be it further enacted by the authority aforesaid*, That the said president, managers, and company shall also keep a just and true account of all and every the moneys received by their several and respective collectors of tolls at the several and respective gates or turnpikes on the said road from the beginning to the end thereof, and shall make and declare a dividend of the clear profits and income thereof, all contingent costs and charges being first deducted among all the subscribers to the said company's stock; and shall on the first Monday in November and May in every year publish the half yearly dividend made of the said clear profits among the stockholders, and of the time and place when and where the same will be paid, and shall cause the same to be paid accordingly.

SEC. 18. *And be it further enacted by the authority aforesaid*, That the said president and managers shall at the end of every year from the date of the incorporation, until the whole road shall be completed, lay before the General Assembly of this commonwealth an abstract of their accounts, showing the whole amount of capital expended in prosecution of the said work, and of the income and profits arising from the said tolls for and during the said respective periods, together with an exact account of the cost and charges of keeping the said road in repair, and all other contingent costs and charges, to the end that the clear annual income and profits thereof may be ascertained and known; and if at the end of two years after the said road shall be completed from beginning to end thereof it shall appear from the average profits at the end of the said two years that the said clear income and profits thereof will not bear a dividend of six per cent. per annum on the whole capital stock of the said company so expended, then it shall and may be lawful for the said president, managers, and company to increase the tolls herein above allowed so much upon each and every allowance thereof as will raise the dividend up to six per cent. per annum; and at the end of every year after the said road shall be completed they shall render unto the General Assembly a like abstract of their accounts; and if at any time the said clear income and profits thereof shall exceed a dividend of nine per cent. per annum, the surplus above that amount, when sufficient shall arise, shall be appropriated by the said president and managers to the purchase of such share or shares of the said stock as the money arising from the said surplus as aforesaid will be found adequate to purchase, until all the said shares shall be so purchased. And the said subscribers shall determine by lot from time to time whose share or shares shall be paid off by the money arising as aforesaid; for which shares the said company shall pay the sums which were originally paid for each respective share; and when the whole number of shares shall be purchased as aforesaid, then the said road shall be free, and no toll whatever shall be exacted.

SEC. 19. *And be it further enacted by the authority aforesaid*, That the said company shall cause posts to be erected and continued at the intersection of every public road falling into and leading out of the said turnpike road, with a board and index-hand pointing to the direction of such road, on both sides whereof shall be inscribed, in legible characters, the name of the town, village, or place to which such road leads, and the distance thereof in computed miles.

SEC. 20. *And be it further enacted by the authority aforesaid*, That the said company shall cause mile-stones to be placed on the side of the said road beginning at the distance of one mile from Philadelphia, and extending thence to the termination of the turnpike aforesaid, whereon shall be marked, in plain legible characters, the respective number of miles which each stone is distant from the bounds of the city of Philadelphia, and at every gate or turnpike by them to be fixed on the said road shall cause the distance from Philadelphia and the distance from the nearest gates or turnpikes in each direction to be marked in legible characters, designating the number of miles and fractions of a mile on the said gates or some other conspicuous place for the information of travellers and others using the said road; and if any person shall wilfully destroy the said posts, boards, index-hands, or mile-stones, or deface the same, or deface the directions made on the said gates or other conspicuous places as aforesaid, or shall, without permission of the acting superintendent of the said road, throw out upon the road or within the limits of the same, and suffer to remain for the space of one day any mould, dirt, shavings, weeds, or rubbish of any kind, such person being convicted thereof by the evidence of one or more credible and disinterested witnesses before any disinterested justice of the peace of the county, he or she shall be adjudged by the said justice to pay a fine not exceeding five dollars, to be recovered with costs, as debts under five pounds are by law recoverable, which fine, when recovered, shall be paid by the said justice to the treasurer of the said company, for the use of said company.

SEC. 21. *And be it further enacted by the authority aforesaid*, That all wagoners and drivers of carriages of all kinds, whether of burden or pleasure, using the said road, shall, except when passing by a carriage of slower draught, keep their horses and carriages on the right hand side of the said road in the passing direction, leaving the other side of the road free and clear for other carriages to pass and to repass; and if any driver shall offend against this provision, he shall forfeit and pay the sum of two dollars to any person who shall be obstructed in his passage and will sue for the same, to be recovered with costs before any justice in the same manner as debts under forty shillings are by law recoverable.

SEC. 22. *And be it further enacted by the authority aforesaid*, That if the company shall not proceed to carry on the said work within two years after the passing this act, or shall not within ten years afterwards complete the said road according to the true intent and meaning of this act, then in either of those cases, all and singular the rights, liberties, privileges, and franchises hereby granted to the company, shall revert to this commonwealth.

SEC. 23. *And be it further enacted by the authority aforesaid*, That if the Legislature should at any time, after the year 1820, think proper to take possession of the said road, three persons shall be appointed by the Governor, and three by the president and managers of the said company, and three by the judges of the supreme court, who, or any six or more of them not having any interest in the said road, shall proceed to examine and estimate the value of the property which the said company have therein, and certify the amount thereof to the Governor of this commonwealth, who shall cause the same to be laid before the Legislature at their next session, and whenever the amount so certified shall be paid by the State to the said company, their right to take toll on the said road, together with all their right, title, claim, and interest therein, shall cease and determine.

ISAAC WEAVER, JUN.,
Speaker of the House of Representatives.
JOHN WOODS,
Speaker of the Senate.

Approved, February 12, 1801.

THOMAS McKEAN,
Governor of the Commonwealth of Pennsylvania.

Supplement to the Germantown and Perkiomen Turnpike act: Passed 1806.

SEC. 2. *And be it further enacted by the authority aforesaid*, That so much of each and every of the incorporating acts of the before recited companies as subjects them severally to a penalty for taking tolls in advance, as is hereby further altered and supplied, shall be, and the same is hereby, repealed.

Extract from the minutes of the Germantown and Perkiomen Turnpike Road Company.

JOSEPH BULLOCK, *Secretary.*

PHILADELPHIA, *August* 20, 1807.

In compliance with the request contained in your note of the 7th instant, and with the wishes of the Secretary of the Treasury, the "Presidents and Directors of the Susquehannah and Lehigh," and of "the Susquehannah and Tioga Turnpike Road Companies," with peculiar pleasure communicate to you the following statement of their several undertakings in Pennsylvania, which, they flatter themselves, will come expressly within the description contained in the resolution of the Senate of the United States, of "objects of public improvement, which require and deserve the aid of the General Government;" that they require such aid, the unfinished state in which they remain, and their deficient capital abundantly prove; that they deserve it, will not be doubted by those who consider an attention to the interior improvement of the United States, and to the facility of the domestic intercourse between their citizens as among the best means of promoting national and individual prosperity.

The two incorporated companies above referred to may be considered as parts of one entire undertaking, having in view, as they connect with others, one great object, viz: to open a direct turnpike communication between the city of Philadelphia and the head of the Seneca lake, in the State of New York; a communication which, in its direction, would be the nearest and best from Philadelphia, and from New York to the shores of Lake Ontario above Sodus bay, and to Upper Canada as well as to Niagara, with its connexions and dependencies; and the safest at all times, being, in its whole distance, through a fertile and increasingly populous country, no part of which, in case of a foreign war, would be subject to the inconveniences of a frontier exposure.

The distance from Philadelphia to the head of the Seneca lake, by the route contemplated, is but two hundred and twelve miles, which distance has been, at different times, and with different views, apportioned into sections, and companies organized or authorized by the Legislature for turnpiking the whole, except in Pennsylvania that part of the road which is between Bethlehem and Weiss's ferry, (twenty-five miles,) and in New York State, from the State line to Newtown, (six miles;) both which sections are in an open country, through which there is now a good road.

From the head of the Seneca lake to the bay of Sodus, on Lake Ontario, is seventy miles through a fine country; so that from the city of Philadelphia to Sodus bay, on that lake, communicating with and bounding on Upper Canada, is, in the whole distance, but two hundred and eighty-two miles, admitting, in all its extent through Pennsylvania, (and we believe also through New York,) of a good road.

To dwell on the immense importance of such a communication to the United States, to the States of Pennsylvania and New York, to the city of Philadelphia, or, to the interior country, would be superfluous to the enlightened Legislature for which the communication is intended, and might be deemed improper from us.

The section of road first undertaken with a view of ultimately uniting the aforesaid points, was that authorized by an act of the Legislature of Pennsylvania, passed March 19, A. D., 1804, "enabling the Governor to incorporate a company by the name of "the President, Managers, and Company of the Susquehannah and Lehigh Turnpike, to make an artificial road from Nescopeck, on the northeast branch of the Susquehannah, to a place called Lausanne, on the north side of Nesquehoning creek, near its entrance into the river Lehigh, a distance of thirty miles." This distance was in part through a mountainous country, but, being about the middle ground, and that which presented the greatest obstacles from its thin population, it was determined to commence the great object in view by first completing this section, which would demonstrate, at the same time, the practicability and the expense of the remainder, and would also immediately open, by this short portage, the water communication from Newtown, on the Tioga, to Philadelphia.

It was accordingly undertaken in the autumn of 1804 and was completed in 1805, so that there is now a good turnpike road through an heretofore almost impassable wilderness, by which the produce of the northeast branch of the Susquehannah, at Nescopeck, may be brought to Lausanne, at the head of the Lehigh navigation, and thence, in times of fresh, and when the navigation of that river shall be improved, at all times to Easton, Trenton, Philadelphia, &c.

The success of this first section of road, and its great benefit to all the surrounding country, induced an application to the ensuing Legislature for a continuance of it to Berwick (on the west side of the Susquehannah, opposite to Nescopeck) or Whopehawly, a few miles above it, to that point on the State line which is nearest to Newtown, on the Tioga, in the State of New York. An act was accordingly passed on the 28th March, 1806, authorizing a company called the "President, Managers, and Company of the Susquehannah and Tioga Turnpike" for this purpose, which was duly organized, and under whose direction the road is now progressing from Berwick as fast as the limited subscription to its stock (which appears in the schedule hereunto annexed) will admit. This section (which consists of seventy-one miles from Berwick to that point on the State line nearest to Newtown, on the Tioga,) terminates near the seventy-mile stone on the line of the State of New York, from whence there is so good a road of six miles to Newtown that a turnpike was not at present deemed necessary. From Newtown to the head of the Seneca lake (eighteen miles) a company is authorized, by an act of the Legislature of the State of New York, to make an artificial road, which would thus terminate at its northern extremity the communication proposed. The experience obtained in making the first section of thirty miles, and the information of the surveyor, who has explored the whole of the section from Berwick to the State line, justify us in the opinion that this last might be completed, as the law requires, at an average rate of $1,000 per mile, amounting, for the whole, to $71,000, of which sum individuals have subscribed, payable in money and in land, one hundred and thirteen shares at $100 each, leaving a deficiency (to complete the whole number of shares contemplated) of five hundred and ninety-seven shares at $100 per share, equal to $59,700.

The completion of the whole of this section, or at least the opening of it, so as to admit the free passage of wagons, is essential to every part of the proposed plan, because its northern commencement is at that point, to and from which the greatest intercourse is contemplated, and a considerable part of its progress is through a country yet but thinly settled and without any good roads. It is believed that $200 per mile, being $14,200, would enable the company to open the road so as to answer every purpose of advantage, except the immediate receipt of toll, which, in a national view, would probably be the last consideration, as it has been of individual attention in every part of this important undertaking; the patrons of which, while they had no doubt that, in a few years, this receipt would amount at least to the legal interest of the money expended, were generally stimulated by considerations more

interesting, and involving their individual interests in the increased prosperity which would be given to the agricultural interests of the State and the commercial benefits to its capital.

At the same session of the Legislature of Pennsylvania, viz: on the 17th of March, 1806, an act was also passed authorizing the president and managers of the Susquehannah and Lehigh Turnpike Company, to extend the section of the thirty mile road, from its termination at Lausanne to Weiss's ferry, formerly called Fort Allen, on the Lehigh, where there is a good bridge over that river; the distance of this section is five miles, and the number of shares authorized to be subscribed for its completion is sixty, at $100 per share, making $6,000, which would be amply sufficient for the object. No part of this section, which, though small, is a very important one, has been yet undertaken, nor shares subscribed; a part of it, of about one and a half miles, is among the worst pieces of road in the whole distance, being through a very narrow defile between the mountain and the river Lehigh, which rises suddenly from its banks.

The same act last mentioned also authorizes a branch road to be made from the main section of thirty miles to any point on the Susquehannah, within three miles above the mouth of Whopehawly creek, and a subscription for making said branch road not to exceed fifty shares at $100 each. This subscription has not yet been made, nor any part of it.

From the termination of the five mile section at Fort Allen, on the Lehigh, the distance to Bethlehem is twenty-five miles through an old settled country, with a road sufficiently good to satisfy the inhabitants, and for which no turnpike has been thought necessary. From Bethlehem to the Spring House tavern, a well known stage road, (thirty-four miles,) an act of assembly authorizes a turnpike road, not yet commenced. The last section from the Spring House tavern over Chestnut hill, and through Germantown to Philadelphia, (eighteen miles,) has a good turnpike road now completed.

Thus it appears, that, in the whole distance of two hundred and twelve miles from Philadelphia to the head of the Seneca lake, in the State of New York, by the route proposed, there are but thirty-one miles for which legislative sanction has not been obtained for the formation of a turnpike road, on principles which it is believed would combine national and individual utility. That a very considerable progress has been made in the several sections of this great work, the practicability of the whole demonstrated, and its expense ascertained, by the completion of several parts, to be very moderate, and trifling, indeed, when compared with the numerous and extensive benefits necessarily flowing from it.

These benefits are, however, at present out of the reach of attainment by individual exertion and capital only, both of which have been extended as far on these objects in Pennsylvania as they will go; it is, therefore, with peculiar pleasure that the friends of interior improvement see, at a moment when their assistance is so necessary, the views of the Government of the United States directed towards them, and encouraged by its request for information, they venture further in taking the liberty of suggesting to the Secretary of the Treasury their opinion that the application of such means as the policy and liberality of the Government of the United States should devote to these objects, would probably be best applied by the Government becoming interested in the stocks of the several companies whose objects require and deserve its support. Then would the funds, they might thus devote, be directed under the superintendence of individuals who would be proportionably interested in their faithful and economical application to the objects intended, and without any compensations or salaries but such as were absolutely necessary to those employed in the actual superintendence and completion of the respective works.

The advocates for internal improvement, from such a union of capital, zeal, and economy, would soon see realized those important advantages to the Union, to the separate States, and to individuals, which have at all times, and in all countries, been the certain consequences of the improvement of their roads and rivers; of the extent of these benefits, the intelligent members of our State Legislature have been generally very sensible, but local interests, or other causes, have hitherto frustrated from this quarter the application of that aid which the extensive views, the liberal policy, and greater ability of the Government of the United States will, we trust, speedily supply.

We are, respectfully, &c.

PETER BROWNE,
President Susqu. and Tioga T. R. Com.
THOMAS STEWARDSON,
BENJAMIN R. MORGAN,
JOS. BENNET EVES,
WM. TURNBULL,
CALEB CRESSON, JUN.,
JOHN ASHLEY,
ANTHONY MORRIS,
SAMUEL M. FOX,
LEVI HOLLINGSWORTH, *Managers.*
THOMAS C. JAMES, *Treasurer.*

ANTHONY MORRIS,
President Susqu. and Lehigh T. R. Com.
BENJAMIN R. MORGAN,
WM. TURNBULL,
THOMAS DOBSON,
SAMUEL HODGDEN,
ROBERT E. GRIFFITH,
LEVI HOLLINGSWORTH,
GODFREY HAGA, *Managers.*
THOMAS C. JAMES, *Treasurer.*

Attest: BLATHWAITE SHOBER, *Secretary.*

General WILLIAM MCPHERSON.

Answers to questions annexed to the resolutions of the Senate of the United States, relative to the Susquehannah and Lehigh turnpike road.

ANSWER 1. From Lausanne, near the Turn Hole on the river Lehigh, to the falls of Nescopeck, on the river Susquehannah, the distance is thirty miles.

ANS. 2. The general elevation of the ascents of the mountains is six degrees, and of the hills near the large streams about five degrees; no particular degree of elevation being required by the act of incorporation.

ANS. 3. The breadth of the road is twenty feet exclusive of the ditches. The form is the segment of an arch rising from about fourteen to sixteen inches. The materials bedded with stone, in all places where stone was convenient, and the soil required it; in the low lands, where stone could not be regularly procured, with logs, when necessary.

ANS. 4. There are four bridges on the road all of wood, three of which are framed and one of logs; dimensions from twelve to eighteen feet in breadth.

ANS. 5. The chief obstructions and difficulties which have all been surmounted were rising the mountains with an easy ascent, and the removal of large trees by the roots, and of heavy rocks or stones.

ANS. 6. The general expense by contract was one thousand dollars per mile, excepting three miles up the ascent of the Broad mountain, which cost fifteen hundred dollars per mile, exclusive of one large bridge over the Nescopeck creek, which cost about seven hundred dollars.

ANS. 7. The capital already expended (raised by the liberality of individual enterprise) amounts to upwards of twenty-five thousand dollars. There remains due to the contractors who made the road, the sum of ten thousand dollars and upwards; such deficit occurring in the stock of the company, in consequence of the whole number of shares contemplated not being subscribed.

ANS. 8. The rates of tolls, as fixed by law for every five miles, are as follow, viz: for every score of sheep, 4 cents; every score of hogs, 6 cents; every score of cattle, 12 cents; every horse or mule, with its rider, &c., 3 cents; every sulkey, chair, or chaise, with two wheels and one horse, 6 cents, or, with two horses, 9 cents; for every chair, coach, phaeton, chaise, stage-wagon, coachee, or light wagon, with two horses and four wheels, 12 cents, or with four horses, 20 cents, &c. *Vide* act of incorporation.

The gross amount of tolls from November, 1806, when toll was first taken, to July, 1807, inclusive, being nine months, is one thousand three hundred and thirty-four dollars, seven cents; one-half of the amount of tolls for the first year is to be paid by contract for keeping the road in complete repair for the aforesaid term, but, after that period, it is presumed it can be done at a much smaller expense; and a great increase of tolls is confidently expected as soon as the road is opened from Nescopeck to the New York line. The nett annual income cannot be ascertained until the expiration of the year.

ANS. 9. The only act of the Legislature on this subject is that under which the company is incorporated, passed March 19, 1804, authorizing a subscription of two hundred and fifty shares, at one hundred dollars each, with liberty to extend the capital stock, if insufficient to complete the road. The number of shares subscribed is two hundred and sixty-seven; but as the whole of these will probably never be paid up, and as the road will cost upwards of thirty-five thousand dollars, there will remain a deficiency, without legislative aid, of at least one hundred shares, or in cash, as before stated, ten thousand dollars and upwards.

The style of the company is "The President, Managers, and Company, of the Susquehannah and Lehigh Turnpike Road."

The limitation of dividends arising from the tolls is to 9 per cent. on the capital stock.

Answers to queries relative to the "Susquehannah and Tioga Turnpike road."

ANSWER 1. From Nescopeck, on the northeast branch of the river Susquehannah, (opposite to Berwick,) to that point on the State line which is nearest to Newtown, on the Tioga, in the State of New York, being a continuation of the Susquehannah and Lehigh turnpike road, distance seventy-one miles.

ANS. 2. The only mountains of any consequence, in the whole distance, are the Nob mountain and the Bald or North mountain, the ascent of which will require an elevation of not more than six degrees, or twenty-one inches in a perch. The act of incorporation requires no particular degree of elevation.

ANS. 3. Breadth of the road required to be formed by an arch of about sixteen inches, is twenty feet exclusive of the ditches on each side, bedded, where necessary, with wood, stone, gravel, or other proper and convenient materials, a sufficient depth to secure a solid foundation, but in many parts, over a hilly country, the solid substance of the natural soil requires no artificial bed.

ANS. 4. Eight bridges only, over streams of any magnitude, will be requisite in the whole distance, to wit:

Over Huntingdon creek, a bridge of seventy-six feet long;
Over South branch of Loyalsock, a bridge of one hundred feet long;
Over middle branch of Loyalsock, a bridge of forty feet long;
Over middle branch of Tawandee, a bridge of forty feet;
Over main branch of Tawandee, a bridge of sixty-five feet,
Over Sugar creek, a bridge of forty feet;
Over Jack creek a branch of Sugar creek, a bridge of twenty-five feet;
Over Bentley's creek, a bridge of twenty feet.

The above bridges to be generally about eighteen feet in width.

ANS. 5. No obstructions or difficulties but such as are common to the making of roads through all parts of the country which are not generally improved or settled, except the Bald or North mountain, and the Nob mountain, over both which the ascent required will not exceed an elevation of six degrees, or twenty-one inches in the perch.

ANS. 6. The general expense averaged at one thousand dollars per mile, which is founded on the experience acquired in the undertaking of a similar road from the Lehigh to Nescopeck, and on the proposals made for a part of the road now under consideration.

ANS. 7. The capital expended is yet but small, being confined to the exploring the best ground, laying down the track of the road, &c.

The whole sum wanted for completing the turnpike road, as the act directs would be, for 71 miles, at one thousand dollars per mile, - - - - - -	$71,000
Of which sum individuals have subscribed 113 shares at $100 per share, - -	11,300
Total deficit, - - -	$59,700

But it is believed that to open the road only the whole distance, (without at present turnpiking it,) so as to admit of the passage of wagons, would not require, including all expenses, more than two hundred dollars per mile, or fourteen thousand two hundred dollars.

ANS. 8. The rates of toll are the same as those annexed to the communication from the Susquehannah and Lehigh turnpike. *Vide* act of incorporation.

The gross amount not ascertained.

ANS. 9. Company incorporated by the name of "The President, Managers, and Company of the Susquehannah and Tioga Turnpike Road," March 28, 1806; which authorizes a capital stock of sixty thousand dollars, to be composed of six hundred shares at one hundred dollars each, with liberty to increase the stock, if necessary; deficient to make up the number of shares mentioned in the act, four hundred and eighty-seven shares, at one hundred dollars each, forty-eight thousand seven hundred dollars.

The dividends to which the company are entitled from the receipt of tolls cannot exceed nine per cent.

PHILADELPHIA AND LANCASTER TURNPIKE COMPANY, *September* 7, 1807.

Your communication of the 7th ultimo, enclosing the copy of a letter from the Secretary of the Treasury, and certain queries respecting canals and artificial roads, to which answers are requested, was duly received at the office of the Philadelphia and Lancaster Turnpike Road. Observing that these queries are made to assist the Secretary in reporting to the Senate of the United States upon the subject of canals and artificial roads, with a view that Congress may afford aid and assistance to such public undertakings, it gives me pleasure, on behalf of the managers of the Philadelphia and Lancaster Turnpike Company, to communicate all the information in my power.

The subscribers to this company were incorporated by letters patent from the Governor of Pennsylvania, by virtue of an act of the Legislature, passed the 9th April, 1792, by the name and style of the "President, Managers, and Company of the Philadelphia and Lancaster Turnpike Road." Of this assembly we believe the honorable Secretary was a member. The capital stock of the company was to consist of one thousand shares of three hundred dollars each, making three hundred thousand dollars, with power to increase the same, if necessary. The object in view was to make an artificial road from the western side of the river Schuylkill, opposite to Market street, to the borough of Lancaster, crossing the Conestoga at Witmer's bridge, a distance of sixty-two miles and eighty perches. The law requires the road to be fifty feet wide—twenty-one feet whereof, at least, to be made an artificial road, to be bedded with wood, stone, gravel, or other hard substance, of an even surface, rising towards the middle by a gradual arch, and in no place to make an angle of more than four degrees with the horizon.

The work was commenced in the month of February, 1793, and completed in December, 1795; since when it has been much improved. The artificial part is twenty-four feet wide, is all made of pounded stone, except the two first miles, which are of coarse gravel; the stone is laid eighteen inches deep in the middle, decreasing to twelve inches at the edges, thereby forming the gradual arch required.

The summer or side road is thirteen feet, and generally ditched. The principal hills in the track of the road are the North and South Valley hills and the Conestoga hills.

The road no where runs more than four degrees above the horizon. This, however, is too much; it ought never to exceed three or three and a half degrees. The great bridges are the "Permanent Bridge," over the Schuylkill, at the beginning of the road; over the Great Brandywine, at Downingtown, and over the Conestoga, near Lancaster. The first of these was lately erected, by a separate company, at an immense expense. It is one of the finest bridges in the United States, and cost near three hundred thousand dollars. The superstructure is of wood, resting on large piers and abutments of solid masonry. It is five hundred and fifty feet in length, abutments and wings seven hundred and fifty feet, and forty-two feet in width; has three arches, the middle one one hundred and ninety-four feet ten inches span, the other two one hundred and fifty feet each; and from the surface of the water to the platform is thirty-one feet. The whole is covered with a shingle roof.

The bridge at Downingtown was erected by the turnpike company at an expense of about twelve thousand dollars, and is built of limestone. It is a strong and elegant piece of masonry of three arches.

The bridge over the Conestoga is of stone, and is private property, belonging to Abraham Witmer, who built it at his own expense. It is a large well built bridge of nine arches.

Besides these there are several bridges upon this road, built at the expense of the turnpike company, all of stone. Those over the Little Brandywine, the Pequa creek, and other streams, are large and well built; indeed, every stream has its stone bridge of different sizes, depending upon the quantity of water and the ground. The swamps or morasses were all filled up with repeated additions of stone to the required height and solidity.

The one thousand shares first contemplated were insufficient; two hundred additional shares were therefore created, making, in the whole, three hundred and sixty thousand dollars. This sum still proved insufficient. The work, nevertheless, was completed by loans; all which have been finally discharged about three months since by the stockholders, making the whole capital expended amount to upwards of four hundred and sixty-five thousand dollars, averaging about seven thousand four hundred and ninety dollars per mile. The stone used was of various kinds and qualities. Of these the dark blue lime-stone is the best. The white lime stone is too soft. Quarrying cost from fifteen to twenty cents per perch. The expense of hauling necessarily depends upon the distance, &c. A four-horse team costs from four to five dollars per day. Stone costs, delivered, from fifty to eighty-seven cents per perch; and, when the distance exceeds three miles, one dollar has been paid. Breaking stone to the size of a hen's egg costs from twenty to twenty-five cents per perch; for breaking and spreading thirty-three cents has been paid. The best gravel near the city costs from eighty-five to one hundred cents per cubic yard, screened and delivered.

The copy of the act of incorporation, herewith, shows the rate of tolls.

There are thirteen toll-gates on the road, and the keeper of each receives from two hundred and fifty to three hundred and fifty dollars per annum.

The amount received from the toll-gatherers, after deducting their respective salaries, is as follows:

For 1799,	- - -	$14,386 80	For 1804, - - - $20,144 90
1800,	- - -	17,627 29	1805, - - - 22,866 29
1801,	- - -	21,158 38	1806, - - - 22,573 47
1802,	- - -	20,336 52	1807, for the first six months of, 18,972 14
1803,	- - -	24,913 21	which far exceeds any preceding year.

The annual repairs are about eight thousand dollars.

The salary of the treasurer, office rent, fire wood, lights for toll-houses, &c. are about one thousand five hundred dollars per annum, making, with the salaries of the toll-gatherers, amounting to three thousand seven hundred and fifty dollars, but deducted as aforesaid, an annual expenditure of about thirteen thousand two hundred and fifty dollars.

The dividends to the 1st of January, 1803, did not average two per cent. on the capital. The road being now, however, completed, and in good repair, the prejudices against the turnpike having, in a great measure, vanished, and the travelling fast increasing, it is confidently believed that the road will hereafter yield from four to five per cent. per annum on the capital stock, and the market price is accordingly near to par, and the stock difficult to be obtained.

On behalf of the managers:

ELLISTON PEROT, *President.*

WILLIAM MCPHERSON, Esq.

AN ACT to enable the Governor of this commonwealth to incorporate a company, for making an artificial road from the city of Philadelphia to the borough of Lancaster.

Whereas, the great quantity of heavy articles, of the growth and produce of the country, and of foreign goods, which are daily transported between the city of Philadelphia and the western counties of the State, requires an amendment to the highway, which can only be effected by artificial beds of stone and gravel, disposed in such manner as to prevent the wheels of carriages from cutting into the soil, the expenses whereof will be great, and it is reasonable that those who will enjoy the benefits of such highway should pay a compensation therefor; and there is reason to believe that such highway will be undertaken by an association of citizens, if proper encouragement be given by the Legislature.

SEC. 1. *Be it therefore enacted by the Senate and House of Representatives of the commonwealth of Pennsylvania, in General Assembly met, and it is hereby enacted by the authority of the same*, That Elliston Perot, Henry Drinker, Jun., Owen Jones, Jun., Israel Whelen, and Cadwallader Evans, of the city of Philadelphia, gentlemen; and Edward Hand, John Hubley, Paul Zantzinger, Matthias Slough, and Abraham Witmer, of the county of Lancaster, gentlemen, be, and they are hereby, appointed commissioners, to do and perform the several duties hereinafter mentioned, that is to say, they shall, on or before the 1st day of May next, procure two books, and in each of them enter as follows: "We, whose names are hereto subscribed, do promise to pay to the president, managers, and company of the Philadelphia and Lancaster Turnpike Road Company, the sum of three hundred dollars, for every share of stock in the said company set opposite to our respective names, in such manner and proportions, and at such times, as shall be determined by the said president and managers, in pursuance of an act of the General Assembly of this commonwealth, entitled 'An act to enable the Governor of this commonwealth to incorporate a company, for making an artificial road from the city of Philadelphia to the borough of Lancaster:' Witness our hands, the ——— day of ———, in the year of our Lord one thousand seven hundred and ninety-two;" and shall thereupon give notice, in three of the public papers in the city of Philadelphia, one whereof shall be in the German language, and in the public paper printed in Lancaster, for one calendar month at least, of the times and places in the said city and borough respectively, when and where the said books shall be open to receive subscriptions of stock for the said company; at which respective times and places some three of the said commissioners shall attend, and shall permit and suffer all persons who shall offer to subscribe in the said books, which shall be kept open for the purpose, at least six hours in every juridical day, for the space of three days, if three days shall be necessary; and on the first of the said days, any person, of the age of twenty-one years, shall be at liberty to subscribe in his own name, or in the name or names of any other person or persons, by whom he shall be authorized, for one share; on the second day, for one or two shares; on the third, for one, two, or three shares; and on any succeeding day, while the said books shall remain open, for any number of shares in the said stock; and if, at the expiration of the said three first days, the said book opened at Philadelphia shall not have six hundred shares therein subscribed, and the said book open at Lancaster, shall not have four hundred shares therein subscribed, the said commissioners respectively may adjourn, from time to time, until the said numbers of shares shall be subscribed, of which adjournments public notice shall be given in at least one public paper in each place; and when the said subscriptions, in the said books, shall amount to the respective numbers aforesaid, the same shall respectively be closed; and if, on that day, and before the said subscriptions shall be declared to be full, applications shall be made to subscribe more shares than will fill the said books, or either of them, to the numbers aforesaid respectively, then the said commissioners respectively shall apportion the whole number of shares unsubscribed, at each respective place, on the morning of that day, among all those who shall have subscribed, or offered to subscribe, as aforesaid on that day, by deducting from the subscribers of more shares than one, such proportion of the shares by them respectively subscribed, as will, with the least fraction, and leaving every person one or more shares, come nearest to the exact number of shares aforesaid: *Provided always*, That every person offering to subscribe in the said books in his own name, or any other name, shall previously pay to the attending commissioners thirty dollars for every share to be subscribed, out of which shall be defrayed the expenses attending the taking such subscriptions, and other incidental charges, and the remainder shall be paid over to the treasurer of the corporation, as soon as the same shall be organized, and the officers chosen, as hereinafter mentioned.

SEC. 2. *And be it further enacted by the authority aforesaid*, That when one hundred persons or more shall have subscribed five hundred or more shares of the said stock, the said commissioners, respectively, may, or when the whole number of shares aforesaid shall be subscribed, they shall certify, under their hands and seals, the names of the subscribers, and the number of shares subscribed by or apportioned to each subscriber, to the Governor of this commonwealth; and thereupon it shall and may be lawful for the Governor, by letters patent, under his hand and the seal of the State, to create and erect the subscribers, and if the said subscriptions be not full at the time, then also those who shall after subscribe to the numbers aforesaid, into one body politic and corporate, in deed and in law, by the name, style, and title of "The President, Managers, and Company of the Philadelphia and Lancaster Turnpike Road;" and by the said name the said subscribers shall have perpetual succession, and all the privileges and franchises incident to a corporation; and shall be capable of taking and holding their said capital stock, and the increase and profits thereof, and of enlarging the same, from time to time, by new subscriptions, in such manner and form as they shall think proper, if such enlargement shall be found necessary to fulfil the intent of this act; and of purchasing, taking, and holding, to them, and their successors and assigns, in fee simple, or for any lesser estate, all such lands, tenements, hereditaments, and estate, real and personal, as shall be necessary to them in the prosecution of their works; and of suing and being sued, and of doing all and every other matter and thing, which a corporation or body politic may lawfully do.

SEC. 3. *And be it further enacted by the authority aforesaid*, That the seven persons first named in the said letters patent shall, as soon as conveniently, may be after sealing the same, give notice in three of the public papers in Philadelphia, and in that printed at Lancaster, one whereof at Philadelphia shall be in the German language, of a time and place by them to be appointed, not less than twenty days from the time of issuing the first notice; at which time and place the said subscribers shall proceed to organize the said corporation, and shall choose, by a majority of votes of the said subscribers, by ballots, to be delivered in person, or by proxy, duly authorized, one president, twelve managers, one treasurer, and such other officers as they shall think necessary to conduct the business of the said company for one year, and until other such officers shall be chosen; and shall or may make such by-laws, rules, orders, and regulations, not inconsistent with the constitution and laws of this commonwealth, as shall be necessary for the well ordering the affairs of the said company: *Provided, always*, That no person shall have more than ten votes at any election, or in determining any question arising at such meeting, whatever number of shares he may be entitled unto, and that each person shall be entitled to one vote for every share by him held under the said number.

SEC. 4. *And be it further enacted by the authority aforesaid*, That the said company shall meet on the second Monday of January in every year, at such place as shall be fixed by their by-laws, for the purpose of choosing other such officers as aforesaid for the ensuing year, in manner aforesaid, and at such other times as

they shall be summoned by the managers, in such manner and form as shall be prescribed by their by-laws; at which annual or special meetings they shall have full power and authority to make, alter, or repeal, by majority of votes, in manner aforesaid, all such by-laws, rules, orders and regulations, as aforesaid, and to do and perform any other corporate act.

Sec. 5. *And be it further enacted by the authority aforesaid*, That the president and managers, first to be chosen as aforesaid, shall procure certificates to be written, or printed, for all the shares of the stock of the said company, and shall deliver one such certificate, signed by the president, and counter-signed by the treasurer, and sealed with the common seal of the corporation, to each person, for every share by him subscribed and held, he paying to the treasurer, in part of the sum due thereupon, the sum of forty-five dollars for each share, which certificate shall be transferable at his pleasure, in person, or by attorney, in the presence of the president or treasurer, subject, however, to all payments due and to grow due thereon; and the assignee holding any certificate, having first caused the assignment to be entered in a book of the company, to be kept for the purpose, shall be a member of the corporation, and for every certificate by him held, shall be entitled to one share of the capital stock, and of all the estate and emoluments of the company, and to vote as aforesaid at the meetings thereof.

Sec. 6. *And be it further enacted by the authority aforesaid*, That the said president and managers shall meet at such times and places, and be convened in such manner as shall be agreed on for transacting their business, at which meetings five members shall form a quorum, who, in the absence of the president, may choose a chairman, and shall keep minutes of all their transactions, fairly entered in a book; and a quorum being met, they shall have full power and authority to agree with and appoint all such surveyors, engineers, superintendents, and other artists and officers, as they shall judge necessary to carry on the intended works, and to fix their salaries or other wages, to ascertain the times, manner, and proportions, when, and in which, the stockholders shall pay the moneys due on their respective shares, in order to carry on the work; to draw orders on the treasurer for all moneys necessary to pay the salaries of persons by them employed, and for the labor and materials done and provided, which orders shall be signed by the president, or, in his absence, by a majority of a quorum, and counter-signed by their clerk; and generally to do and transact all such other acts, matters, and things, as by the by-laws, rules, orders, and regulations of the company shall be committed to them.

Sec. 7. *And be it further enacted by the authority aforesaid*, That if any stockholder, after thirty days notice in three of the public papers printed in the city of Philadelphia, as aforesaid, of the time and place appointed for the payment of any proportion or dividend of the said capital stock, in order to carry on the work, shall neglect to pay such proportion at the place appointed, for the space of sixty days after the time so appointed, every such stockholder, or his assignee, shall, in addition to the dividend so called for, pay after the rate of five per centum per month for every delay of such payment; and if the same, and the said additional penalty, shall remain unpaid for such space of time, as that the accumulated penalties will become equal to the sums before paid in part, and on account of such share, the same shall be forfeited to the said company, and may and shall be sold by them to any other person or persons willing to purchase, for such price as can be obtained therefor.

Sec. 8. *And be it further enacted by the authority aforesaid*, That it shall and may be lawful to and for the said president and managers, their superintendents, surveyors, engineers, artists, and chain-bearers, to enter into and upon all and every the lands, tenements, and enclosures, in, through, and over which the said intended turnpike road may be thought proper to pass, and to examine the ground most proper for the purpose, and the quarries and beds of stone and gravel, and other materials in the vicinity, that will be necessary in making and constructing the said road, and to survey, lay down, ascertain, mark, and fix such route or tract for the same, as, in the best of their judgment and skill, will combine shortness of distance with the most practicable ground from the west side of Schuylkill river, opposite to the city of Philadelphia, so as to pass near to or over the bridge on Brandywine creek, near Downing's town; from thence to Witmer's bridge, on Connestogoe creek, and from thence to the east end of King street, where the buildings cease in the borough of Lancaster.

Sec. 9. *And be it further enacted by the authority aforesaid*, That it shall and may be lawful to and for the said president and managers, by and with their superintendents, engineers, artists, workmen, and laborers, with their tools and instruments, carts, wagons, wains, and other carriages, and beasts of draught or burden, to enter upon the lands in, over, contiguous, and near to which the route and tract of the said intended road shall pass, first giving notice of their intention to the owners thereof, or their representatives, and doing as little damage thereto as possible, and repairing any breaches they may make in the enclosures thereof, and making amends for any damages that may be done to any improvements thereon, by appraisement to be made in the manner hereinafter directed, and upon a reasonable agreement, if they can agree, or, if they cannot agree, then upon an appraisement to be made, upon oath or affirmation, by three indifferent freeholders, or any two of them agreeing, to be mutually chosen; or if the owners, upon due notice, shall neglect or refuse to join in the choice, then to be appointed by any justice of the peace of the county not interested on either side, and tender of the appraised value, to dig, take and carry away, any stone, gravel, sand, or earth, there, being most conveniently situated for making or repairing the said road.

Sec. 10. *And be it further enacted by the authority aforesaid*, That the said president, managers, and company shall have power to erect permanent bridges over all the waters crossing the said route or tract, betwixt the river Schuylkill and Connestogoe, wherever the same shall be found necessary, and shall cause a road to be laid out fifty feet wide, twenty-one feet whereof in breadth, at least, shall be made an artificial road, which shall be bedded with wood, stone, gravel, or any other hard substance, well compacted together, a sufficient depth to secure a solid foundation to the same; and the said road shall be faced with gravel, or stone pounded, or other small hard substance, in such manner as to secure a firm, and, as near as the materials will admit, an even surface, rising towards the middle by a gradual arch, and so nearly level in its progress as that it shall in no place rise or fall more than will form an angle of four degrees, with a horizontal line, and shall forever hereafter maintain and keep the same in good and perfect order and repair, from the city of Philadelphia to Witmer's bridge, and thence to the borough of Lancaster.

Sec. 11. *And be it further enacted by the authority aforesaid*, That so soon as the said president, managers, and company, shall have perfected the said road for any distance from the city of Philadelphia, not less than ten miles, towards the said borough, and so from time to time any other like distance, progressively, they shall give notice thereof to the Governor of the commonwealth, who shall thereupon forthwith nominate and appoint three skilful and judicious persons to view and examine the same, and to report to him, in writing, whether the said road is so far executed in a masterly, workmanlike manner, according to the true intent and meaning of this act; and if their report shall be in the affirmative, then the Governor shall, by license, under his hand and the lesser seal of the commonwealth, permit and suffer the said president, managers, and company, to erect and fix such and so many gates or turnpikes upon and across the said road, as will be necessary and sufficient to collect the tolls and duties hereinafter granted to the said company, from all persons travelling in the same, with horses, cattle, carts, and carriages.

Sec. 12. *And be it further enacted by the authority aforesaid*, That the said company having perfected the said road, or such part thereof, from time to time, as aforesaid, and the same being examined, approved, and licensed, in manner aforesaid, it shall and may be lawful for them to appoint such and so many toll-gatherers as they shall think proper, to collect and receive of and from all and every person and persons using the said road, the tolls and rates hereinafter mentioned, and to stop any person riding, leading, or driving any horses, cattle, hogs, sheep, sulkey, chair, chaise, phaeton, cart, wagon, wain, sleigh, sled, or other carriage of burden or pleasure, from passing through the said gates or turnpikes, until they shall respectively have paid the same; that is to say, for every space of ten miles in length of the said road, the following sums of money, and so in proportion for any greater or lesser distance, or for any greater or lesser number of sheep, hogs, or cattle, viz: for every score of sheep, one-eighth of a dollar; for every score of hogs, one-eighth of a dollar; for every score of cattle, one-quarter of a dollar; for every horse and his rider, or led horse, one-sixteenth of a dollar; for every sulkey, chair, or chaise, with one horse and two wheels, one eighth of a dollar; for every chariot, coach, stage, wagon, phaeton, or chaise, with two horses and four wheels, one-quarter of a dollar; for either of the carriages last mentioned, with four horses, three-eighths of a dollar; for every other carriage of pleasure, under whatever name it may go, the like sums, according to the number of wheels and horses drawing the same; for every cart or wagon, whose wheels do not exceed the breadth of four inches, one-eighth of a dollar for each horse drawing the same; for every cart or wagon, whose wheels shall exceed in breadth four inches, and not exceed seven inches, one-sixteenth of a dollar for every horse drawing the same; for every cart or wagon, the breadth of whose wheels shall be more than seven inches, and not more than ten inches, or, being of the breadth of seven inches, shall roll more than ten inches, five cents for every horse drawing the same; for every cart or wagon, the breadth of whose wheels shall be more than ten inches, and not exceed twelve inches, or being ten inches, shall roll more than fifteen inches, three cents for every horse drawing the same; for every cart or wagon, the breadth of whose wheels shall be more than twelve inches, two cents for every horse drawing the same.

Sec. 13. *And be it further enacted by the authority aforesaid*, That no wagon or other carriage with four wheels, the breadth of whose wheels shall not be four inches, shall be drawn along the said road between the 1st day of December and the 1st day of May following, in any year or years, with a greater weight thereon than two and a half tons, or with more than three tons during the rest of the year; that no such carriage, the breadth of whose wheels shall not be seven inches, or, being six inches or more, shall not roll at least ten inches, shall be drawn along the said road between the said 1st day of December and May, with more than three and a half tons, or with more than four tons during the rest of the year; that no such carriage, the breadth of whose wheels shall not be ten inches or more, or, being less, shall not roll at least twelve inches, shall be drawn along the said road between the said 1st days of December and May, with more than five tons, or with more than five and a half tons during the rest of the year; that no cart, or other carriage with two wheels, the breadth of whose wheels shall not be four inches, shall be drawn along the said road with a greater weight thereon than one and a quarter tons, between the said 1st day of December and May, or with more than one and a half tons during the rest of the year; that no such carriage, whose wheels shall not be of the breadth of seven inches, shall be drawn along the said road with more than two and a half tons between the said 1st days of December and May, or with more than three tons during the rest of the year; that no such carriage, whose wheels shall not be the breadth of ten inches, shall be drawn along the said road between the said 1st days of December and May, with more than three and a half tons, or with more than four tons during the rest of the year; that no greater weight than seven tons shall be drawn along the said road, in any carriage whatever, between the said 1st days of December and May, nor more than eight tons during the rest of the year; that no cart, wagon, or carriage of burden whatsoever, whose wheels shall not be of the breadth of nine inches at least, shall be drawn or pass in or over the said road, or any part thereof, with more than six horses, nor shall more than eight horses be attached to any carriage whatsoever, used on the said road; and if any wagon or other carriage shall be drawn along the said road by a greater number of horses, or with a greater weight than is hereby permitted, one of the horses attached thereto shall be forfeited to the use of the said company, to be seized and taken by any of their officers or servants, who shall be at liberty to choose which of the said horses they may think proper, excepting the shaft or wheel horse or horses. *Provided, always*, That it shall and may be lawful for the said company, by their by-laws, to alter any or all the regulations herein contained, respecting the burdens on carriages to be drawn over the said road, and to substitute other regulations, if, upon experience, such alterations shall be found conducive to the public good.

Sec. 14. *And be it further enacted by the authority aforesaid*, That all such carriages as aforesaid, to be drawn by oxen in the whole, or partly by horses and partly by oxen, two oxen shall be estimated as equal to one horse, in charging all the aforesaid tolls, and every mule as equal to one horse.

Sec. 15. *And be it further enacted by the authority aforesaid*, That if the said company shall neglect to keep the said road in good and perfect order and repair, for the space of five days, and information thereof shall be given to any justice of the peace of the neighborhood, such justice shall issue a precept, to be directed to any constable, commanding him to summon three judicious freeholders to meet at a certain time, in the said precept to be mentioned, at the place in the said road which shall be complained of, of which meeting notice shall be given to the keeper of the gate or turnpike nearest thereto; and the said justice shall, at such time and place, by the oaths or affirmations of the said freeholders, inquire whether the said road, or any part thereof, is in such good and perfect order and repair as aforesaid, and shall cause an inquisition to be made, under the hands of himself and of a majority of the said freeholders; and if the said road shall be found by the said inquisition to be out of order and repair, according to the true intent and meaning of this act, he shall certify and send one copy of the said inquisition to each of the keepers of the turnpikes or gates between which such defective place shall be, and from thenceforth the tolls hereby granted to be collected at such turnpikes or gates, for passing the interval of road between them, shall cease to be demanded, paid, or collected, until the said defective part or parts of the said road shall be put into good and perfect order and repair, as aforesaid; and if the same shall not be so put into good and perfect order and repair before the next ensuing court of quarter sessions of the county wherein the same shall be, the said justice shall certify and send a copy of the said inquisition to the justices of the said court, and the said court shall thereupon cause process to issue, and bring in the bodies of the person or persons intrusted by the company with the care and superintendence of such part of the said road as shall be so found defective, and shall proceed upon such inquisition, in the same manner and form as upon indictments found by the grand inquest for the body of the county, against supervisors of the highways, for neglect of their duty; and if the person or persons, intrusted by the said company as aforesaid, shall be convicted of the offence by the said inquisition charged, the said court shall give such judgment, according to the nature and aggravation of the neglect, as, according to right and justice, would be proper in the case of supervisors of the highways neglecting their duty; and fines and penalties so to be imposed shall be recovered in the same manner as fines for misdemeanors are usually recovered in the said courts, and shall be paid to the supervisors of the highways of the place wherein the offence was committed, to be applied to repairing such highways as the township or county is bound to maintain and repair at the public expense thereof.

SEC. 16. *And be it further enacted by the authority aforesaid*, That the president and managers of the said company shall keep fair and just accounts of all moneys to be received by them from the said commissioners, and from the subscribers to the said undertaking, on account of their several subscriptions, and of all penalties for delay in the payment thereof, and of the amount of the profits on the shares which may be forfeited as aforesaid, and also of all moneys by them to be expended in the prosecution of their said work, and shall, once at least in every year, submit such accounts to a general meeting of the stockholders, until the said road shall be completed, and until all the costs, charges, and expenses of effecting the same shall be fully paid and discharged, and the aggregate amount of such expenses shall be liquidated and ascertained; and if, upon such liquidation, or whenever the whole capital stock of the said company shall be nearly expended, it shall be found that the said capital stock will not be sufficient to complete the said road, according to the true intent and meaning of this act, it shall and may be lawful for the said president, managers, and company, at a stated or special meeting, to be convened according to the provisions of this act, or their own by-laws, to increase the number of shares to such extent as shall be deemed sufficient to accomplish the work, and to demand and receive the moneys subscribed for such shares in like manner and under the like penalties as are hereinbefore provided for the original subscriptions, or as shall be provided by their by-laws.

SEC. 17. *And be it further enacted by the authority aforesaid*, That the said president, managers, and company shall also keep a just and true account of all and every the moneys to be received by their several and respective collectors of tolls, at the several gates or turnpikes on the said road, from beginning to end; and shall make and declare a dividend of the clear profits and income thereof, all contingent costs and charges being first deducted, among all the subscribers to the said company's stock; and shall, on every the second Monday in January and July in every year, publish the half-yearly dividend to be made of the said clear profits among the stockholders, and of the time and place, when and where the same will be paid, and shall cause the same to be paid accordingly.

SEC. 18. *And be it further enacted by the authority aforesaid*, That the said president and managers shall, at the end of every third year from the date of the incorporation, until two years next after the whole road shall be completed, lay before the General Assembly of this commonwealth an abstract of their accounts, showing the whole amount of their capital expended in the prosecution of the said work, and of the income and profits arising from the said toll, for and during the respective periods, together with an exact account of the costs and charges of keeping the said road in repair, and all other contingent costs and charges, to the end that the clear annual income and profits thereof may be ascertained and known; and if, at the end of two years after the said road shall be completed, from the beginning to the end thereof, it shall appear, from the average profits of the said two years, that the said clear income and profits thereof will not bear a dividend of six per centum per annum on the whole capital stock of the said company so expended, then it shall and may be lawful to and for the said president, managers, and company, to increase the tolls herein above allowed, so much upon each and every allowance thereof, as will raise the dividends up to six per centum per annum; and at the end of every ten years after the said road shall be completed, they shall render to the General Assembly a like abstract of their accounts for the three preceding years; and if, at the end of any such decennial period, it shall appear from such abstract that the clear profits and income of the said company will bear a dividend of more than fifteen per centum per annum, then the said toll shall be so reduced as will reduce the said dividend down to fifteen per centum per annum.

SEC. 19. *And be it further enacted by the authority aforesaid*, That the said company shall cause posts to be erected at the intersection of every road falling into and leading out of the said turnpike road with boards, and an index hand, pointing to the direction of such road, on both sides whereof shall be inscribed, in legible characters, the name of the town, village, or place, to which such roads lead, and the distance thereof, in computed miles.

SEC. 20. *And be it further enacted by the authority aforesaid*, That the said company shall cause mile-stones to be placed on the side of the said road, beginning at the distance of one mile from the east side of Schuylkill, and extending thence to the borough of Lancaster, whereon shall be marked, in plain legible characters, the respective number of miles which each stone is distant from the west bounds of the city of Philadelphia; and at every gate or turnpike by them to be fixed on the said road, shall cause the distance from Philadelphia, and the distances from the nearest gates or turnpikes in each direction to be marked in legible characters, designating the number of miles and fractions of a mile on the said gate, or some other conspicuous place; and also to cause to be affixed at such places a printed list of the rates of toll, which, from time to time, may lawfully be demanded, for the information of travellers and others using the said road.

SEC. 21. *And be it further enacted by the authority aforesaid*, That all wagoners and drivers of carriages of all kinds, whether of burden or pleasure, using the said road, shall, except when passing by a carriage of slower draught, keep their horses and carriages on the right hand side of the said road, in the passing direction, leaving the other side of the road free and clear for other carriages to pass and repass; and, if any driver shall offend against this provision, he shall forfeit and pay the sum of two dollars, to any person who shall be obstructed in his passage; and will sue for the same, to be recovered, with costs, before any justice, in the same manner as debts under ten pounds are by law recoverable.

SEC. 22. *And be it further enacted by the authority aforesaid*, That if the said company shall not proceed to carry on the said work within two years after the passing of this act, or shall not, within seven years afterwards, complete the said road, according to the true intent and meaning of this act, then, in either of those cases, it shall and may be lawful for the Legislature of the commonwealth to resume all and singular the rights, liberties, privileges, and franchises, hereby granted to the company.

WILLIAM BINGHAM,
Speaker of the House of Representatives.
SAMUEL POWELL,
Speaker of the Senate.

Approved, April 9, 1792.

THOMAS MIFFLIN,
Governor of the Commonwealth of Pennsylvania.

AN ACT to extend, for a limited time, an act entitled "A further supplement to the act entitled an act for making an artificial road from the city of Philadelphia to the borough of Lancaster, and for other purposes."

SEC. 1. *And be it enacted by the Senate and House of Representatives of the commonwealth of Pennsylvania in General Assembly met, and it is hereby enacted by authority of the same*, That the act, entitled "A further supplement to the act entitled an act for making an artificial road from the city of Philadelphia to the borough of Lancaster," passed the 4th day of April, in the year of our Lord one thousand seven hundred and ninety-eight,

which, by its own limitation, was to continue in force during the term of two years and no longer, be, and the same is hereby, declared to be continued in force for seven years from the passing of this act, and from thence to the next session of the General Assembly, and no longer.

Sec. 2. *And be it further enacted by the authority aforesaid*, That the president and managers of the said turnpike road, for the time being, shall and may, and they are hereby authorized and empowered to grant, demise, and to farm, let, to any person or persons with whom they can agree, the tolls and duties which they, by virtue of the act incorporating them, or by any supplementary act, are authorized to demand and receive for passage in upon and along the said road, at any gate or turnpike over or by the side of the same road, or any part of the same, for any term not exceeding seven years, under such rents and convenient reservations and conditions as the said president and managers at any meeting of their board shall agree upon, which grants and demises shall have the same construction, force, and effect as other like grants and demises made between private persons have and receive at law.

CADWALADER EVANS, Jun.
Speaker of the House of Representatives.
ROBERT HARE,
Speaker of the Senate.

Approved, April 11th, 1799.

THOMAS MIFFLIN,
Governor of the Commonwealth of Pennsylvania.

I, Matthew Irwin, master of rolls, &c., for the State of Pennsylvania, do hereby certify the above to be a true copy, or exemplification, of a law enrolled in my office.

Witness my hand and seal of office, this 13th May, 1799.

MATTHEW IRWIN, *M. R.*

A further supplement to the act entitled "An act for making an artificial road from the city of Philadelphia to the borough of Lancaster;" for the more effectual preventing evasions of the salutary regulations intended in and by the act for making an artificial road from the city of Philadelphia to the borough of Lancaster.

Sec. 1. *And be it therefore enacted by the Senate and House of Representatives of the commonwealth of Pennsylvania in General Assembly met, and it is hereby enacted by the authority of the same*, That if any person or persons whatsoever, owning, riding in, or driving any sulkey, chair, chaise, phaeton, cart, wagon, wain, sleigh, sled, or other carriage of burden or pleasure, or owning, riding, leading, or driving any horse, mare, gelding, hogs, sheep, or other cattle, shall therewith pass through any private gate or bars, or along or over any private passage, way, or other ground, near to or adjoining any turnpike or gate, erected, or which shall be erected in pursuance of the act to which this is a supplement, with an intent to defraud the company, and evade the payment of toll or duty for passing through any such gate or turnpike; or if any person or persons shall, with such intent, take off, or cause to be taken off, any horse, mare, gelding, or other cattle, from any sulkey, chair, chaise, phaeton, cart, wagon, wain, sleigh, sled, or other carriage of burden or pleasure, practise any other fraudulent means or device with the intent that the payment of any such toll or duty may be evaded or lessened; or if any person or persons having, claiming, or taking the benefit of any exemption or privilege, by virtue of this act, or of the said recited act, or any clause, matter, or thing herein or therein contained, not being entitled thereto, or committing any fraud or abuse thereof, either by him, her, or themselves, or by giving any licence to any other person or persons not entitled to such privilege or exemption, whereby, or by means whereof the said tolls or duties might be lessened or evaded, or with any such intent, all and every person and persons, in all and every or any of the ways or manners aforesaid offending, shall, for every such offence, respectively forfeit and pay to the president, managers, and company of the Philadelphia and Lancaster turnpike road, any sum not less than four, nor more than fifteen dollars, to be sued for and recovered, with costs of suit, before any justice of the peace, in like manner, and subject to the same rules and regulations as debts under twenty pounds may be sued for and recovered.

Sec. 2. *And be it further enacted by the authority aforesaid*, That if any person or persons shall wilfully break, deface, or pull up any mile-stone placed, or which shall be placed in pursuance of the said recited act, on the side of the road laid out in pursuance thereof, or shall obliterate the letters or figures inscribed thereon or therein, or if any person or persons shall break, pull down, destroy, or injure any post erected, or to be erected, in pursuance of the said recited act, at the intersection of any road falling into and leading out of the said turnpike road, or the board or index hand affixed thereto, in conformity to the directions of the said recited act, or if any person or persons shall obliterate the letters or figures inscribed or fixed thereon, or if any person or persons shall destroy or obliterate, or in any wise injure or deface the letters, figures, or other characters marked at any turnpike or gate erected or to be erected in pursuance of the said recited act, for all or any of the purposes therein mentioned, or the whole, or any part or parts of any printed list of the rates of tolls, affixed or to be affixed, in pursuance of the directions of the said recited act, at any such gate or turnpike, he, she, or they so offending in the premises, shall, and each of them shall, for every such offence, severally and respectively forfeit and pay to the said president, managers, and company, the sum of twenty dollars, to be sued for and recovered with costs of suit, before any justice of the peace, in like manner as aforesaid.

Sec. 3. *And be it further enacted by the authority aforesaid*, That, for the purpose of ascertaining the weight that may be drawn along the said road, in any cart, wagon, or other carriage of burden, it shall and may be lawful for the said president, managers, and company, to erect and establish scales and weights at or near such and so many of the gates erected, or to be erected in pursuance of the said recited act, as they may think proper; and where there may seem reasonable cause to suspect that any cart, wagon, or other carriage of burden carries a greater weight than is or shall be by law allowable for their toll-gatherers, or other persons in their service or employment, to prevent the same from passing such gate or turnpike until such cart, wagon, or other carriage of burden shall be drawn into the scales, fixed or erected at or near any such gate or turnpike, and the weight or burden drawn therein ascertained by weighing; and if the person or persons driving, or having care or charge of any such cart, wagon, or other carriage of burden shall refuse to drive the same into any such scales for the purpose aforesaid, the person or persons so refusing shall forfeit and pay to the said president, managers, and company any sum not less than five nor more than ten dollars, to be recovered in the manner herein before mentioned.

Sec. 4. *And be it further enacted by the authority aforesaid*, That if any action or suit shall be brought or prosecuted by any person or persons, for any thing done in pursuance of this or the said recited act, or former supplement thereto, in relation to the premises, every such suit or action shall be commenced within six months next after the fact committed and not afterwards; and the defendant or defendants in such action or suit may plead the

general issue, and give this and the said recited act and former supplement, and the special matter in evidence, and that the same was done in pursuance and by the authority of this and the said recited act and former supplement; and this act shall be and continue in force during the term of two years and no longer.

GEORGE LATIMER,
Speaker of the House of Representatives.
ROBERT HARE,
Speaker of the Senate.

Approved, April 4th, 1798.

THOMAS MIFFLIN,
Governor of the Commonwealth of Pennsylvania.

I, Matthew Irwin, Esq., master of rolls for the State of Pennsylvania, do hereby certify the preceding writing to be a true copy or exemplification of a certain law enrolled in my office.

In witness whereof, I have hereunto set my hand and seal of office the 5th day of April, A. D. 1798.

MATTHEW IRWIN, *M. R.*

AN ACT to enable the President, Managers and Company of the Philadelphia and Lancaster Turnpike Road to increase the width of the said road in certain cases.

SEC. 1. *Be it enacted by the Senate and House of Representatives of the commonwealth of Pennsylvania, in General Assembly met, and it is hereby enacted by the authority of the same*, That the president, managers, and company of the Philadelphia and Lancaster Turnpike Road be, and they are hereby, authorized and empowered, whenever the turnpike road has been laid out on the ground of any road heretofore laid out and opened of a greater width than fifty feet, to increase the width of the said turnpike road to the same extent, on the same ground as the former road had been laid out and opened: provided the same shall not exceed sixty-eight feet.

SEC. 2. *And be it further enacted by the authority aforesaid*, That in such other places as the said president, managers and company shall deem necessary, and the owners of the land shall be willing to sell them the ground requisite therefor, they be, and hereby are, in like manner authorized and empowered to increase the width of the said road, so as not to exceed sixty-eight feet: *Provided always*, That the said additional width of the road shall be under the same regulations, and kept in good and perfect order and repair, under the same forfeitures and penalties, as the other parts of the said road by law are subject to.

SEC. 3. *Provided always, and be it further enacted by the authority aforesaid*, That it shall not be lawful for the said turnpike company, from and after the passing of this act, to ask, demand, or receive from or for any persons or things passing along the said road, eastward of the creek known by the name of the Five Mile, or Indian creek, any toll for a greater distance than they shall actually travel: *And provided also*, That it shall not be lawful for the said company to ask, demand, or receive from or for persons living on or adjacent to the said road, who may have occasion to pass by the said road upon ordinary business relative to their farms or occupations, and who shall not have any other convenient road or way by which they may pass, any toll for passing on or by the said turnpike.

GEORGE LATIMER,
Speaker of the House of Representatives.
ROBERT HARE,
Speaker of the Senate.

Approved, April 17, 1795.

THOMAS MIFFLIN,
Governor of the Commonwealth of Pennsylvania.

By the Board:

WILLIAM GOVETT, *Secretary.*

A BY-LAW of the President, Managers, and Company of the Philadelphia and Lancaster Turnpike Road.

By virtue, and in pursuance of the proviso of the thirteenth section of the Act of Incorporation of the said company, the following resolution is declared to be a by-law of the said corporation.

Resolved, By the president, managers, and company of the Philadelphia and Lancaster turnpike road, that from and after the first day of March next, no wagon or carriage with four wheels, the breadth of whose wheels shall not be four inches, shall be drawn along the said road between the first day of December and the first day of May following, in any year or years, with a greater weight thereon than two tons; or with more than two and a half tons during the rest of the year.

Extract from the Minutes,
WILLIAM GOVETT, *Secretary.*

PENNSYLVANIA, *ss.*

In the name and by the authority of the commonwealth of Pennsylvania, Thomas M'Kean, Governor of the said commonwealth, to all to whom these presents shall come, sends greeting:

Whereas, during the last session of the General Assembly of this commonwealth, an act was passed in the following words, to wit: "An act to render perpetual a certain act respecting the Philadelphia and Lancaster Turnpike Road."

SEC. 1. *Be it enacted by the Senate and House of Representatives of the commonwealth of Pennsylvania, in General Assembly met, and it is hereby enacted by the authority of the same*, That the act entitled "A further supplement to the act entitled 'An act making an artificial road from the city of Philadelphia to the borough of Lancaster, for the more effectual preventing evasions of the salutary regulations, intended in and by the act for making an artificial road from the city of Philadelphia to the borough of Lancaster,'" passed on the fourth day of April, in the year of our Lord one thousand seven hundred and ninety-eight, be, and the same hereby is, except so much thereof as limits its continuance to the term of two years, rendered perpetual.

SEC. 2. *And be it further enacted by the authority aforesaid*, That instead of the power and authority given and allowed to the president, managers, and company of the Philadelphia and Lancaster turnpike road, in and by the thirteenth section of the act entitled "An act to enable the Governor of this commonwealth to incorporate

a company for making an artificial road from the city of Philadelphia to the borough of Lancaster," to seize and take, by any of their officers and servants, one of the horses attached to any wagon or other carriage, which shall be drawn along the said road, contrary to the provisions and intentions of the said section, any person or persons offending against the said section or transgressing against the provisions and restrictions therein imposed, shall forfeit and pay to the president, managers and company aforesaid, for every offence, the sum of ten dollars, to be recovered as other penalties are directed to be recovered in the said recited act, or by distress and sale according to law, in case of neglect or refusal forthwith to pay the said penalty; and the power and authority to take and seize a horse, as is provided and directed in and by the said thirteenth section, is hereby annulled and made void. *Provided, nevertheless*, That no part of this act shall have any force or effect, until the said president, managers and company shall, in writing, under their corporate seal, to be deposited in the office of the secretary of this commonwealth, declare their consent and agreement hereto; and as soon as the said company shall so consent and agree, the Governor shall declare this act to have full operation and effect.

SIMON SNYDER,
Speaker of the House of Representatives.
P. C. LANE,
Speaker of the Senate.

Approved, April 11, 1807.

THOMAS McKEAN.

And whereas, the President, Managers, and Company of the Philadelphia and Lancaster Turnpike road, have fully complied with the proviso contained in the second section of the aforesaid act of the General Assembly.

Now, therefore, know ye, that, in pursuance of the directions to me given, by the said act of the General Assembly, I, the said Thomas M'Kean, Governor of the said commonwealth, do, by these presents, declare and make known, that from and after the day of the date hereof, the said act of the General Assembly, and every part thereof, is to have full operation and effect.

Given under my hand, and thegreat seal of the State, at Lancaster, this tenth day of June, in the year of our Lord, one thousand eight hundred and seven, and of the commonwealth the thirty-second.

By the Governor:

THOS. M. THOMPSON, *Secretary.*

July 20, 1807.

TURNPIKE ROADS IN MARYLAND.

Collector's Office,

Sir: Baltimore, *October* 24, 1807.

Enclosed I transmit you, in the temporary absence of the collector, a letter received from Richard Caton, Esq., President of the Falls Turnpike Company.

I have the honor to be very respectfully, sir, your obedient servant,

JOHN BRICE, *Deputy Collector.*

Albert Gallatin, Esq., *Secretary of the Treasury.*

Sir: Baltimore, *October* 13, 1807.

In conformity to your request, expressed by your letter of the 3d of August last, I have subjoined some observations on the Falls turnpike road, so as to meet the questions asked by the Secretary of the Treasury, and transmitted by you to me.

I am, with respect, sir, your obedient servant,

RICHARD CATON.

Mr. J. Brice, Jun., *Deputy Collector, Baltimore.*

First. The Falls turnpike road unites, by the most direct route the trade of the north, with Baltimore; it is in a direct line to Hanover and Carlisle. The latter place must, one day, become a middle point of trade for the Genesee, and many of the counties of Pennsylvania lying west of the Susquehannah; from whence it will be carried, by the nearest road, to some Atlantic port, which is Baltimore, by the Falls turnpike. There is a road at present in use to Carlisle, called "the Reisterstown road," which enjoys this trade, only because the Falls road is not opened; for it will appear, by casting an eye on the map of the United States, that a line stretched from Baltimore on the east side of Jones's falls (which is the ground occupied by the Falls road) to Carlisle, will cover Hanover. By the Falls road, the distance from Baltimore to the line of Pennsylvania, on a direction to Hanover, is thirty-one and a half miles. By the Reisterstown road to the same point, on the line of the State of Pennsylvania, the distance is said to be near thirty-five miles.

Second. There are no hills on the route to Pennsylvania, by the Falls turnpike road, which cannot be ascended with four degrees: to this limit the charter confines the company.

Third. The breadth of the Falls turnpike road is, by law, required to be sixty feet, of which at least eighteen feet must be of stone pounded; for, although gravel may, in some places, make a hard foundation, it is not found in sufficient extent of country to make any considerable distance of road.

Fourth. The bridges of the Falls road already constructed are of stone. Their dimensions are generally small, not exceeding arches of ten feet. There will be required three bridges over the stream of Jones's falls, that are intended to be built of wood, resting on an abutment of stone at each end of the bridge: one of these bridges will have a span of fifty feet; one of forty feet; and one of thirty feet. They will cost, on an average, $1,500 each.

Fifth. No natural difficulties lie in the way of a completion of the Falls turnpike road; some prejudices to turnpikes generally, and a rival interest of the Reisterstown Road Company, have impeded its progress; but these time and good sense will subdue.

Sixth. The whole of the expenses per mile, for forming the road agreeably to the charter; for reducing hills to an ascent, not exceeding four degrees; for stoning it with pounded stone, on an average twenty-two feet wide, and ten to twelve inches deep; for covering the surface of these stones with an inch or two of gravel or sand; and for building the whole of the bridges, will not exceed $7,500 per mile.

Seventh. The capital already expended on the Falls turnpike road amounts to nearly $30,000. There is required about $38,000 in addition to complete the work. This money will eagerly be subscribed when the company can get

get permission from the Legislature of Maryland to make a good road from the end of the Falls turnpike to a road which leads to the State line of Pennsylvania, at the distance of nine miles from the end of the Falls turnpike. These nine miles the company offer to straighten, shape, level, and bridge; and when so done, to give it to the county as a free road. Hitherto the Legislature have refused the permission, its members alleging that it will draw the trade from the Reistertown road. The application must, however, prevail, as it is founded on justice and public utility. When such a law shall be obtained, it is thought that individuals will readily subscribe what money may be necessary.

Eighth. Not having finished the road, the toll-gates are not erected, and, consequently, the road derives no revenue. The rates of tolls are the same as are granted to all the roads chartered by the State of Maryland, viz: for the whole extent of the Falls road, which somewhat exceeds nine miles, one-sixteenth of a dollar for a single horse; one-eighth of a dollar for every horse in a wagon, the wheels of which do not exceed four inches; and in a like ratio for other things passing the gate. The toll on wagons decreases in proportion to the breadth of the wheels.

It is probable that the Falls turnpike road will be very lucrative; for, taking it as a general rule, that short roads are profitable, and long roads the reverse, the rule is in favor of the falls road: but there is a more solid reliance. The Falls turnpike road passes by a number of mills which are daily supplying Baltimore with flour, and receiving from thence wheat. Along the Falls are nearly all the quarries, which supply stone to the city for buildings. It passes two of the richest valleys in the country, that on the stream of Jones's falls, and that on the Western run. In addition to these, it will command, notwithstanding, the local interest of a rival road, the trade of the north, which passes through Hanover, because it is the shortest approach from thence to Baltimore.

The wagons which pass to Baltimore from the mills, and stone quarries, will generally have broad wheels, as it is found to be an object in the saving of tolls; from this circumstance, the Falls road will be kept in repair at a very moderate expense. Materials are abundant; in no case will they be required to be hauled more than half a mile.

Ninth. The charter of the Falls Turnpike Road Company is unlike others granted by the State; its duration is perpetual; its profits may be divided to any extent; but it insures no dividend, by allowing an augmentation of the present tolls, should they be inadequate to the repairs, and a dividend of ten per cent., as granted by the State to the other roads. This conditional augmentation of toll is rather a nominal than a real benefit; for it has already been proven, that wagons will avoid the road under the present tolls; and they will be more inclined to do so should they be augmented.

The affairs of the Falls Turnpike Road Company are administered by a president and six managers chosen annually by the stockhoders; each share is entitled to a vote as far as ten shares; persons holding beyond that number have no votes beyond ten. A share is $100.

RICHARD CATON.

BALTIMORE AND REISTERTOWN TURNPIKE ROAD OFFICE,

SIR: *November* 16, 1807.

In the absence of the president, I herewith transmit you the answers to the several questions propounded by the Secretary of the Treasury under a resolution of the Senate of the United States.

I have the honor to be, very respectfully, sir, your most obedient servant,

JOHN F. HARRIS, *Secretary.*

J. BRICE, JUN. Esq., *Deputy Collector, Baltimore.*

BALTIMORE AND REISTERTOWN TURNPIKE ROAD COMPANY.

Answer to queries respecting artificial roads.

BALTIMORE, *November* 16, 1807.

1st. Baltimore and a point in the Pennsylvania line toward Hanover are united; distance about thirty-five miles; and Baltimore and a point in the Pennsylvania line towards Petersburg are united; distance about forty-five miles. The road forks at Reistertown, sixteen miles from Baltimore.

2d. The greatest elevation of the hills is twenty-four feet perpendicular above the bed of the road. The greatest angle of ascent which has been allowed, is three and a half degrees.

3d. Breadth of the road, including the ditches, is sixty-six feet. Breadth of the artificial road, exclusive of the ditches, is forty feet. The form convex, twenty-four feet in width along the middle of the road, and one foot in depth, is bedded with stone broken small enough to pass through a ring of three inches diameter. The rest is clay.

4th. The largest bridge is twenty-one feet wide in the clear, built of stone, supported by three semi-circular arches; the largest arch is twenty-four feet, the other two arches are each sixteen feet diameter. All the bridges are built of stone.

5th. Particular difficulties surmounted, and to be encountered, are cutting through hills and filling up valleys.

6th. Expense per mile about $10,000 for forming the bed of the road, cutting hills, quarrying, transporting, breaking, and laying stone; all which labor is farmed out together by the mile.

7th. Capital already expended, about $200,000; vested, $420,000. Ten miles of the road are completed, and the work is progressing.

8th. Rate of tolls will be seen in the substance of the charter; amount of tolls, annual expense of repairs, and contingencies, and annual net income, cannot be stated as tolls, have been received only on ten miles, and for ten months.

9th. Substance of the charter. Enclosed are the laws of Maryland on the subject.

In the absence of the president.

JOHN F. HARRIS, *Secretary.*

AN ACT to incorporate companies to make several turnpike roads through Baltimore county, and for other purposes. Passed January 2, 1805.

SECTION 1. *Preamble.*—Whereas it is represented to this General Assembly that, by the several laws heretofore passed on this subject, the desirable object contemplated by the Legislature has not been obtained, and the public expectation almost entirely frustrated; therefore,

Sec. 2. *Be it enacted by the General Assembly of Maryland*, That the three following companies shall be incorporated, to wit: One for making a turnpike road from the city of Baltimore, through New Market, to and through Fredericktown, and from thence to and through Middletown, and from thenee to Boonsborough; one for making a turnpike road from Baltimore, through Reistertown, to the Pennsylvania line towards Hanover town, and through Westminster to the Pennsplvania line towards Petersburgh, as shall be agreed upon by a majority of the stockholders; and one other company for making a turnpike road from Baltimore towards Yorktown, to the Pennsylvania line.

Sec. 3. *And be it enacted*, That subscription books be opened for a capital stock of two hundred and twenty thousand dollars, in shares of twenty dollars each, and that subscriptions be taken in for one hundred thousand dollars of the same at the city of Baltimore, under the direction of James Carey, Luke Tiernan, George F. Warfield, and Francis Hollingsworth; for fifty thousand dollars at Fredericktown, under the direction of John Schley, Henry Ridgely Warfield, and David Levy; for twenty thousand dollars at Middletown, under the direction of Frederick Stemple, Joseph Swearingen, and Samuel Shoup; and for fifty thousand dollars at Elizabethtown, under the direction of Thomas Sprigg, Nathaniel Rochester, Charles Carroll, Jacob Zeller, and Elie Williams, for the first beforementioned road; and for a capital stock of one hundred and sixty thousand dollars, in shares of twenty dollars each, at the city of Baltimore, under the direction of William Owings, Solomon Etting, David Williamson, Edward Johnson, Doctor John Cromwell, and Charles Carnan, for the second before-mentioned road; and for a capital stock of one hundred thousand dollars, in shares of twenty dollars each, at the city of Baltimore aforesaid, for the third before-mentioned road, under the direction of James Winchester, Joseph Thornburgh, Thomas McEldry, Nicholas Merriman, of Elijah and David McMechin, who are hereby appointed commissioners for the purposes aforesaid, who shall, for each of the companies for which they are respectively appointed, on or before the first Monday of April next, procure books, and in each enter as follows, to wit: "We, whose names are hereunto subscribed, do promise to pay to the president, managers, and company of the, [here insert the name of the company] the sum of twenty dollars for every share of stock in the said company set opposite to our respective names, agreeably to an act of the State of Maryland entitled "An act to incorporate companies to make several turnpike roads through Baltimore county, and for other purposes. Witness our hands, this ——— day of ——, eighteen hundred and ——," and shall give notice in two of the public newspapers in Baltimore, one in Easton, and both in an English and German newspaper in Fredericktown and Elizabethtown, for one month at least, of the times when, and places where, the said books will be open to receive subscriptions of stock for such respective company or companies, at which times and places at least two of the said respective commissioners shall attend for each of the said respective companies, and shall permit and suffer all persons who shall offer to subscribe in person, or by attorney duly authorized, in the said books, which shall be kept open for that purpose, at least four hours every day, Sundays excepted, for the space of three days, if three days shall be necessary: *Provided, nevertheless*, That the said commissioners shall not permit any one person or company to subscribe for more than twenty-five shares during the first day on which the said books shall be opened in either of the respective companies, nor more than fifty shares on the second day on which the said books shall be opened; and if, at the expiration of the said three first days, the said books shall not have for each respective road the full number subscribed, the said respective commissioners may adjourn, from time to time, until the number of shares respectively shall be subscribed, of which adjournment public notice shall be given in at least two of the public papers of the city of Baltimore; one in Easton, and in an English and German paper in Frederick and Elizabethtown; and when the said subscriptions in the said books shall amount to the said respective numbers aforesaid, the same shall be closed: *Provided always*, That every person offering to subscribe in the said books in his own name, or in the name of any other person, shall, upon subscribing, pay to the attending commissioners one dollar for every share to be subscribed, out of which shall be defrayed the expense attending the taking such subscription, and other incidental charges, and the remainder shall be deposited in one or more of the banks of Baltimore, for the use of each respective corporation for which the same shall be taken, as soon as the same shall be organized, and the officers chosen as hereinafter mentioned.

Sec. 4. *And be it enacted*, That when one hundred persons or more shall have subscribed two thousand five hundred shares or more of the said stock, of the first before-mentioned company, and when one hundred persons or more shall have subscribed two thousand five hundred shares or more of the said stock of the said second beforementioned company, and when eighty persons or more shall have subscribed two thousand shares or more of the said stock of the said third before-mentioned company, the said commissioners heretofore named for each respective road shall, as soon as conveniently may be, give thirty days notice in two of the newspapers of the city of Baltimore; one in Easton, and in an English and German paper in Frederick and Elizabethtown, of the time and place by them appointed for the subscribers to meet, in order to organize the said corporation, and to choose, by a majority of votes of the said subscribers, by ballot, to be delivered in person, or by proxy, duly authorized, one president, eight managers, one treasurer, and such other officers as shall be deemed necessary to conduct the business of each of the said companies, until the third Monday in October next, and until like officers shall be thereafter chosen, and make such by-laws, rules, orders, and regulations as do not contravene the constitution and laws of this State, and may be necessary for the well governing the affairs of the said companies: *Provided always*, That no person shall have more than twenty-five votes in any election, or in determining any question arising at such meeting, whatever number of shares he, she, or they may be entitled to notwithstanding, and that each person be entitled to one vote for every share so held under the said number twenty-five.

Sec. 5. *And be it enacted*, That the stockholders in the said respective companies shall be, and they are hereby, incorporated and constituted three separate and distinct bodies politic; the first before-mentioned by the name of The President, Managers, and Company of the Baltimore and Fredericktown Turnpike Road, the second before-mentioned company by the name of The President, Managers, and Company of the Baltimore and Reistertown Turnpike Road, and the third before-mentioned company by the name of The President, Managers, and Company of the Baltimore and Yorktown Turnpike Road, and by the same names, the said subscribers and their successors, shall have succession during the continuance of this incorporation, and shall have all the privileges and franchises of, or incident to, a corporation, and shall be capable of taking and holding the said capital stock, and the increase and profits thereof, and of enlarging the same, from time to time, by new subscriptions on the original terms, in such manner and form as they shall think proper, if such enlargement shall be found necessary to fulfil the intent of this act, and of purchasing and taking to them, and their successors, in fee simple, and for any lesser estate, all such lands, tenements, hereditaments, and estate, real and personal, as shall be necessary to them in the prosecution of their works, provided the said real estate shall not exceed twenty acres in any one lot or parcel, and of suing and being sued, answer and being answered; and each of the said companies shall have power to make a seal, and alter, and break, and renew the same, according to their will and pleasure.

Sec. 6. *And be it enacted*, That the sums so subscribed shall be paid to the managers elected agreeably to this act, in the manner following, to wit: one-fourth part thereof (including the one dollar paid to the commissioners at the

time of subscribing) at the end of one month after the election of managers; one-fourth part at the end of six months after the election of managers; and the remainder in such sums, and at such times, as the managers may appoint; they giving two months' notice of the payments so required in each of the aforementioned papers.

Sec. 7. *And be it enacted*, That the first before-mentioned company shall meet on the first Monday in October next, and on the first Monday in October in each succeeding year; the second before-mentioned company shall meet on the second Monday in October next, and on the second Monday in October in each succeeding year; and the third before-mentioned company shall meet on the third Monday in October next, and on the third Monday in October in each succeeding year, for the purpose of choosing such other officers as aforesaid for the ensuing year, in manner aforesaid, and at such other times as they shall be summoned, in such manner and form as shall be prescribed by their respective by-laws; at which annual or special meetings they shall have full power and authority to make, alter, or repeal, by a majority of votes, in manner aforesaid, all such by-laws, rules, orders, and regulations, made as aforesaid, and to do and perform any other corporate act herein authorized.

Sec. 8. *And be it enacted*, That the respective presidents and managers first chosen as aforesaid, shall procure certificates for all the shares of the stock of the said company, and shall deliver one such certificate, signed by the president, and countersigned by the treasurer, and sealed with the common seal of the said respective company, to each person or persons for every share by him, her, or them subscribed and held, he, she, or they having paid to the commissioners aforesaid one dollar for each share, which certificate shall be transferable at his, her, or their pleasure, in person or by attorney duly authorized, in the presence of the president or treasurer, subject, however, to all payments due, and to become due thereon, and the assignee holding any certificate, having first caused the assignment to be entered in a book of the company to be kept for that purpose, shall be a member of the corporation, and for every certificate assigned to him, her, or them, as aforesaid, shall be entitled to one share of the capital stock, and of all the estate and emoluments of the company, and to vote as aforesaid at the meetings thereof.

Sec. 9. *And be it enacted*, That the said respective presidents and managers shall meet at such times and places as shall be ordained by their respective by-laws, and, when met, five members shall form a quorum, who, in the absence of the president, may choose a chairman, and shall keep minutes of all their transactions, fairly entered in a book; and, a quorum being formed, they shall have full power and authority to appoint all such surveyors, engineers, superintendents, and other officers, as they shall deem necessary to carry on their intended works, and to fix their salaries and wages, and to draw on the bank for all moneys as shall have been so as aforesaid deposited by the commissioners aforesaid, which drafts shall be signed by the said respective presidents, or, in their absence, by a majority of a quorum, and countersigned by their treasurer, and, generally, to do all such other acts, matters, and things, as by this act, and the respective by-laws, rules, orders, and regulations of the company, they shall be authorized to do.

Sec. 10. *And be it enacted*, That, after thirty days' public notice in all the public papers aforesaid of the time and place appointed for the payment of any proportion of the said capital stock of either of the said companies, any stockholder shall neglect to pay such proportion, at the place appointed, for the space of thirty days after the time so appointed, every such stockholder, his, her, or their assignee, shall, in addition to the payment so called for, pay at the rate of five per cent. per month for delay of such payment; and, if the same, and the said additional penalty, shall remain unpaid for such space of time as that the accumulated penalties shall become equal to the sums before paid, in part, on account of such share or shares, the same shall be forfeited to the said company, and may and shall be sold and assigned by the president and managers of said company to any person willing to purchase the same, for such price as can be obtained for the same, and the purchaser or purchasers aforesaid shall have all the benefit and advantage of such assignment and purchase as if he, she, or they had been an original stockholder.

Sec. 11. *And be it enacted*, That the said roads shall be made in, over, and upon the beds of the present roads, as laid out and confirmed by the commissioners of review, and the several acts of Assembly relating to the same, and also upon every extension of the said roads as established by this law: *Provided always*, That, should it appear, on a resurvey of any part of the extension of said roads by sworn surveyors, that a considerable saving in distance would thence arise to the public, and in expense to the company or companies, that in all such cases it shall be lawful to depart from the tract of the road so originally laid down, and improve the shorter and less expensive route: *Provided, also*, That, in all such deviations, the road shall not be diverted or taken from any town or village through which it now passes, nor shall it pass through the meadows, gardens, orchards, or grain fields, whilst the grain or crop is growing therein, without the consent of the proprietor or proprietors thereof: *And provided, also*, That no deviations shall be made from the bed of the Reistertown and Yorktown turnpike roads, as now laid out and confirmed.

Sec. 12. And whereas Baltimore county has, from time to time, laid out and expended considerable sums of money in turnpiking said roads, and it is reasonable and just that the said county should be reimbursed the value to the company of the said turnpike improvements made thereon: Therefore,

Be it enacted, That the levy court of Baltimore county, at their next meeting after the respective presidents and managers shall have been chosen, shall be, and they are hereby, authorized and directed to appoint three persons, such as they may deem suitable, for each of the respective roads aforesaid, due notice of which appointment, in writing, with the names of the persons appointed, shall be given to the presidents, respectively; and, upon such notice being given, the said respective presidents and managers shall forthwith appoint a like number, on the part of their respective companies, within ten days after being informed as aforesaid of the appointments by the levy court, and shall immediately give notice thereof to the said persons appointed by the levy court, which six commissioners, so appointed for each respective road, shall, within ten days after the notice aforesaid, meet, and proceed to choose, from out of the next adjoining county to that respective road, three other persons such as they may deem suitable, which nine persons, after being duly qualified before some justice of the peace truly and impartially to estimate the value of the aforesaid turnpike improvements to the respective companies, shall compose a commission, neither of which shall be interested in the stock of the said road which they may be appointed to value, and shall proceed to value and determine the then value of the said improvements on the said roads, and deliver a copy of their said award, within twenty days after the day of the first meeting of said commissioners, under their respective hands and seals, or, in case of disagreement, a majority of the said commissioners shall sign and seal the same, and deliver one such copy thereof to the clerk of the levy court of Baltimore county, and another to the president and managers of the company for the road for which they shall have been appointed, each, provided they accept to act under such appointment, under the penalty of five hundred dollars, one-half thereof to the use of the said county, and the other half for the use of the said company, to be recovered as other fines and forfeitures are for the uses aforesaid under this act; and the said road shall, upon the returning and the filing of said award with the clerk of Baltimore county levy court, be the property of the said company, they first paying each commissioner, so chosen to determine the value of each respective road, the sum of five dollars for each day by him employed in viewing said road, and in making such valuation; and, if it shall so happen that any of the said commissioners shall die, resign, or refuse to act, the justices of the levy court, or such person as they may appoint for that purpose, and the companies, respectively, shall forthwith proceed to fill up such vacancies.

Sec. 13. *And be it enacted*, That the certificates of shares, to the amount of the valuations aforesaid for each respective road, shall be made out by the respective companies, in the name of the levy court of Baltimore county, and delivered to the said court, and all dividends or profits arising on said shares shall be paid to the levy court of Baltimore county, to be appropriated by the said levy court in such manner to the use of the said county as they think proper.

Sec. 14. *And be it enacted*, That the levy court shall have all the privileges of voting at elections as any individual or company holding a like number of shares of the said stock would have.

Sec. 15. And, whereas, the road leading towards Fredericktown was laid out and confirmed by the commissioners of review only so far as the line of Baltimore county, and the road from the end of the aforesaid road through Anne Arundel county to the Anne Arundel county line, on a direction towards Fredericktown, was laid out by commissioners appointed by law for that purpose, and from thence through part of Baltimore county, and partly through Frederick county, to Fredericktown, was laid out by commissioners appointed by law for that purpose, which said roads have been opened and put into their present state of improvement at the expense of the said counties: And, whereas, it is reasonable and just that the said counties should be paid the value of the said improvements: *Therefore be it enacted*, That the present rights of the said counties to the said road, and improvements made thereon, shall be ascertained in the same manner as is herein before directed, for ascertaining the value of the turnpike roads in Baltimore county, and the President, Managers, and Company of the Baltimore and Fredericktown Turnpike Road shall pay the amount of the said valuations to the levy court of each respective county, or their orders, on or before the end of two years from the time the said respective valuation or valuations shall be made and returned to the said president and managers, and the respective levy court aforesaid, the said respective parts of the said road shall thereupon be vested in the said President, Managers, and Company of the Baltimore and Fredericktown Turnpike Road during the continuance of this act of incorporation.

Sec. 16. *And be it enacted*, That in all cases where stone, gravel, earth, or sand, not already quarried or dug for the use of the owner, or for sale, shall be necessary for making or repairing either of the said turnpike roads, the president and managers of the company, or a majority of them, or any person authorized by them, may agree with the owner or owners of said materials for the purchase of the same, or with the said owner or owners of the land on which the same may be, for the purchase of said land, and in case of disagreement, or in case the owner should be a *feme coverte*, under age, or *non compos*, or out of the State or county, the president of the company, or any person authorized by him for that purpose, shall apply to a justice of the peace for the county wherein the said materials may be, which justice shall thereupon issue his warrant, directed to the sheriff of the county, commanding him to summon twelve disinterested persons, qualified to serve as jurors in the county court, to meet at the place where the said materials may be, and the said sheriff shall qualify the said persons, either by oath or affirmation, (as the case may be,) justly, truly, and impartially, to value the damage which may be sustained by the owner or owners of the materials required by such company; and the said persons shall, after valuing the damage which may be sustained by the owner or owners of such materials, and return, under their hands and seals, to the justice who issued the warrant, one copy of their said valuation, one other copy to the president of the company, and one other copy to the owner or owners of the said materials, if such owner shall reside in the county where the said materials may be, and shall not be under any legal disability to receive the money adjudged, and give sufficient discharges therefor, and the president and managers shall pay, or secure to be paid, the damages so adjudged before they shall proceed to remove the said materials; and if the owner or owners of such materials shall reside out of the county, or be under any legal disability, then the president and managers shall enter into bond, conditioned for the payment of the damages assessed to the person or persons who may be duly authorized to receive the same, and shall lodge said bond, and a copy of the said valuation, in the office of the clerk of the county court, to be by him recorded, and upon such bond, or an office copy thereof, suit or suits may be instituted against the obligors therein named, by any person or persons entitled to receive such damages; and the justice and sheriff shall be entitled to receive the same fees for services under this act as they are allowed in similar cases; and the persons summoned as jurymen to value the damages sustained as aforesaid, shall each receive one dollar for every day he shall attend for that purpose, which fees and allowance shall be paid by the president and managers of the company at whose instance the persons may have been summoned.

Sec. 17. *And be it enacted*, That the said presidents, managers, and companies shall have power to erect permanent bridges over all the waters crossing the said roads, wherever the same shall be found necessary, and shall cause the said roads to be kept open to the same width, and in the same place, as they were originally laid out and confirmed by the commissioners of review, and acts of Assembly, heretofore passed, relating thereto, and shall cause twenty feet thereof, in breadth at least, to be made an artificial road, which shall be bedded with wood, stone, or gravel, or any other hard substance, well compacted together, a sufficient depth to secure a solid foundation to the same; and the said road shall be faced with gravel or stone pounded, or other small hard substance, in such manner as to secure a firm, and as near as the materials will reasonably admit, an even surface, and so nearly level in its progress as that it shall in no place rise or fall more than will form an angle of four degrees, with a horizontal line, except over the Catoctin and South mountains, where it may rise or fall to an angle of six degrees, with a horizontal line, and shall forever hereafter, during the continuance of said incorporation or incorporations, maintain and keep the same in good and perfect order and repair.

Sec. 18. *And be it enacted*, That it shall and may be lawful for the levy court of Baltimore county to keep up the respective turnpike gates on the said respective roads, as the same are now set up and established, and appoint toll-gatherers to receive the tolls, and to take at each of the said gates or turnpikes the same tolls that are now established at said gates or turnpikes, until the said companies shall have completed the distance of ten miles of each or either of the said roads from the city of Baltimore, when it shall and may be lawful for the said companies to establish and set up gates, appoint toll-gatherers, and receive tolls agreeably to the provisions of this act; provided that it shall be the duty of the first before-mentioned company to complete and keep in repair, from their intersection, as well the road leading into Pratt street as the road leading into Baltimore street, in the manner prescribed in this act; and provided, also, that no turnpike or gate shall be set up on or across the said road between the intersection of the road leading from Montgomery court-house to the city of Baltimore and Ellicott's lower mills on Patapsco falls.

Sec. 19. *And be it enacted*, That as soon as either of the said presidents, managers, and company shall have perfected either of the roads for any distance from the city of Baltimore, not less than ten miles, and so on, from time to time, any other like distance progressively, they shall give notice thereof to the Governor of this State, who shall thereupon forthwith nominate and appoint three skilful and judicious persons to view and examine the same, and report to him in writing, whether the said road is so far extended in a masterly workmanlike manner, according to the true intent and meaning of this act, and if their report shall be in the affirmative, then the Governor shall, by licence under his hand and the seal of the State, permit and suffer the said presidents, managers, and companies, to erect and fix on such and so many gates or turnpikes upon and across the said road as will be necessary and

sufficient to collect the tolls and duties hereinafter granted to the said company, from all persons travelling on the same with horses, cattle, wagons, carts, and carriages.

Sec. 20. *And be it enacted*, That the said respective companies, having perfected either of the said respective roads, or such parts thereof, from time to time, as aforesaid, and the same being examined, approved, and licensed, in manner as aforesaid, it shall and may be lawful for them to appoint such and so many toll-gatherers as they shall think proper, to collect and receive of and from all and every person and persons using the said road, the tolls and rates hereinafter mentioned, and to stop any person riding, leading, or driving any horses, cattle, hogs, sheep, sulkey, chair, chaise, phaeton, coach, coachee, cart, wagon, wain, sleigh, sled, or other carriage of pleasure or burden, from passing through the said gates or turnpikes, until they shall have respectively paid the same; that is to say, for every space of ten miles in length of the said road, the following sum of money, and so in proportion for any greater or lesser distance, or for any greater or lesser number of sheep, hogs, or cattle, viz: for every score of sheep, one-eighth of a dollar; for every score of hogs, one-eighth of a dollar; for every score of cattle, one-fourth of a dollar; for every horse and his rider, or led horse, one-sixteenth of a dollar; for every chair or chaise, with one horse and two wheels, one-eighth of a dollar; for every chariot, coach, stage, wagon, phaeton, or chaise, with two horses and four wheels, one-quarter of a dollar; for either of the carriages last mentioned, with four horses, three-eighths of a dollar; for every other carriage of pleasure, under whatsoever name it may go, the like sums, according to the number of wheels and horses drawing the same; for every cart or wagon whose wheels do not exceed in breadth four inches, one-eighth of a dollar for each horse drawing the same; for every cart or wagon, whose wheels shall exceed in breadth four inches, and not exceeding seven inches, one-sixteenth of a dollar for every horse drawing the same; for every cart or wagon, the breadth of whose wheels shall be more than seven inches, and not more than ten inches, or being of the breadth of seven inches, shall roll more than ten inches, five cents for every horse drawing the same; for every cart or wagon, the breadth of whose wheels shall be more than ten inches, and not exceeding twelve inches, or being ten inches, shall roll more than fifteen inches, three cents for every horse drawing the same; for every cart or wagon, the breadth of whose wheels shall be more than twelve inches, two cents for every horse drawing the same.

Sec. 21. *And be it enacted*, That for the purpose of ascertaining the weight that may be drawn along the said road in any cart, wagon, or other carriage of burden, it shall and may be lawful for the said president, managers and company, to erect and establish scales and weights at or near such and so many of the gates erected, or to be erected in pursuance of this act, as they may think proper, and where there may seem reasonable cause to suspect that any cart, wagon, or other carriage of burden, carries a greater weight than is or shall be by law allowable, it shall be lawful for the toll-gatherers, or other persons in their service or employment, to prevent the same from passing such gate or turnpike, until such cart, wagon, or carriage of burden, shall be drawn into the fixed or erected scales at or near any such gate or turnpike, and the weight or burden drawn therein ascertained by weighing; and if the person or persons driving or having care or charge of any such cart, wagon, or other carriage of burden, shall refuse to drive the same into any such scales for the purpose aforesaid, the person or persons so refusing shall forfeit and pay to the said president, managers and company, any sum not less than five dollars, nor more than eight dollars, to be recovered in the manner hereinafter mentioned.

Sec. 22. *And be it enacted*, That no wagon, or other carriage with four wheels, the breadth of whose wheels shall not be four inches, shall be drawn along the said road with a greater weight thereon than three tons; that no such carriage, the breadth of whose wheels shall not be seven inches, or being six inches or more, shall roll at least ten inches, shall be drawn along the said road with more than five tons, that no such carriage, the breadth of whose wheels shall not be ten inches or more, or being less shall not roll at least twelve inches, shall be drawn along the said road with more than eight tons; that no cart or other carriage with two wheels, the same breadth of wheels as the wagons aforesaid, shall be drawn along the said road with more than half the burden or weight aforesaid; and if any cart, wagon, or carriage of burden whatsoever, shall be drawn along the said road with a greater weight than is hereby allowed, the owner or owners of such carriage, if the excess of burden shall be three hundred weight or upwards, shall forfeit and pay four times the customary tolls, for the use of the company: *Provided always*, That it shall and may be lawful for the said company, by their by-laws, to alter any or all the regulations herein contained respecting the burdens of carriages to be drawn over the said road, and to substitute other regulations, if upon experiment such alteration shall be found conducive to the public good: *Provided, nevertheless*, That such regulations shall not lessen the burdens of carriages above described.

Sec. 23. *And be it enacted*, That the treasurer of the western shore be and he is hereby constituted a court of inspection, and it shall and may be the duty of the respective companies, once every year, (and oftener if required by the court,) to lay before the same a correct and methodical account of their disbursements and expenditures, and of the amount of the tolls collected and received on their respective roads for and during the twelve months preceding, and whenever the tolls shall, during two following years, exceed ten per centum, free of all charges on the institution, the said court shall, at their discretion, hold the excess thus arising above the said ten per centum, in reserve, to meet any future deficiency, or if in their judgment a continuance of the then tolls would produce a like annual excess, to lower the tolls, or any of them, so as to bring the aggregate on the roads respectively to ten per centum per annum; and the said court may, in their discretion, on the representation of the aforesaid companies, revise the tolls herein established, so as to render them in their operation more favorable to the commerce and the industry of the citizen.

Sec. 24. *And be it enacted*, That the stockholders of the present companies shall be entitled to receive ten per centum per annum, and no more, over and above all charges and deductions whatsoever; and the president and managers of the respective companies shall keep a just and true account of all and every the moneys received by their several and respective collectors of tolls at the several and respective gates and turnpikes on the said roads from the beginnings to the ends thereof, which account shall be upon oath, or affirmation, as the case may be, and shall make a dividend of the clear profits and income thereof, not exceeding ten per centum in any year, among all the stockholders of every description, and shall, on the first Monday in November and May in every year, publish the half-yearly dividend made of the said clear profits as aforesaid, and of the time and place when and where the same shall be paid, and shall cause the same to be paid accordingly.

Sec. 25. *And be it enacted*, That all such carriages as aforesaid to be drawn by oxen in the whole, or partly by horses and partly by oxen, two oxen shall be estimated as equal to one horse in charging all the aforesaid tolls, and every mule as equal to one horse.

Sec. 26. *And be it enacted*, That if the said companies, after any of the said roads are completed as aforesaid, shall neglect to keep the said roads in good and perfect order for the space of fifteen days, and information shall be given to any justice of the peace of the neighborhood, within the county where the repair ought to be made, such justice shall issue a precept, to be directed to any constable, commanding him to summon three disinterested persons, to be named by the said justice in the said precept, to meet at a certain time in the said precept to be mentioned, at the place in the said road which shall be complained of, of which meeting notice shall be given to the keeper of the gate or turnpike nearest thereto, and the said justice shall, at such time and place, on the oaths or

affirmations of the said persons, inquire whether the said road, or any part thereof, is in such good and perfect order and repair as aforesaid, and shall cause an inquisition to be made and certified under the hands of himself and a majority of the said persons; and if the road shall be found by the said inquisition to be out of order and repair, contrary to the true intent and meaning of this act, the said justice shall certify and send one copy of the said inquisition to each of the keepers of the turnpikes or gates between which such defective place shall be, and from thenceforth the tolls hereby granted to be collected at such turnpikes or gates shall cease to be demanded, paid or collected, until the said defective part or parts shall be put in good and perfect order and repair as aforesaid; and if the same shall not be put in good and perfect order and repair before the next county court of the said county, the aforesaid justice shall certify and send a copy of the inquisition aforesaid to the judges of the county court, who shall thereupon cause to be brought before them the body or bodies of the person or persons intrusted by the company with the care and superintendence of such part of the said road as shall be found defective; and if the said person or persons intrusted by the company or companies aforesaid, shall be convicted of the offence by the said inquisition charged, the said court shall fine the said person or persons, according to the nature and aggravation of the neglect, in their discretion, not exceeeding one hundred dollars, for every week such place shall have been out of order and repair; and in case the said company should neglect to have the said place repaired within fifteen days after the aforesaid fine shall have been laid, then the said court shall proceed to fine the said president, managers and company, in their discretion, not exceeding two hundred dollars, for the use of the county under the direction of the levy court.

Sec. 27. *And be it enacted*, That if any person or persons whomsoever, riding in or driving any sulkey, chair or chaise, phaeton, cart, wagon, wain, sleigh, sled, or other carriage of burden or pleasure, riding or leading any horse, mare or gelding, or driving any hogs, sheep, or cattle, shall therewith pass through any private gates or bars, or along or over any private gates or bars, or along or over any private passage, way, or other ground near to or adjoining any turnpike gate erected, or which shall be erected in pursuance of this act, or heretofore erected, with an intention to defraud the company, and avoid the payment of the toll or duty for passing through any such gate or turnpike; or if any person or persons shall, with such intent, take off, or cause to be taken off, any horse, mare or gelding, or other cattle, from any wagon, or carriage of burden or pleasure, or practise any other fraudulent means or device, with the intent that the payment of any such tolls or duty may be evaded or lessened, all and every person or persons, in all, every or any of the ways or manners aforesaid offending, shall, for every such offence, respectively, forfeit and pay to the said respective president, managers and company, of the road on which said fraud shall or may be practised, any sum not exceeding ten dollars, to be sued for and recovered, with costs of suit, before any justice of the peace, in like manner as debts of a similar amount may be sued for and recovered: *Provided always*, That if any person or persons shall be prosecuted under this section, and the said prosecution shall not be sustained on the part of the prosecutor, then and in such case the person or persons prosecuted as aforesaid shall receive from the company the sum of twenty dollars, in lieu of damages from delay and vexatious prosecution, recoverable as other fines under this act; and if any toll-gatherer shall knowingly demand and receive any greater toll from any person or persons than such toll-gatherer is authorized to demand and receive by virtue of this act, such toll-gatherer shall forfeit and pay the sum of twenty dollars for every such offence, to the use of the county in which the forfeiture is incurred, and for the payment of which the said company shall be responsible.

Sec. 28. *And be it enacted*, That the presidents and managers of the said companies shall keep fair and just accounts of all moneys received by them from the said commissioners, and from the subscribers to the said undertakings on account of the several subscriptions, and of all penalties for delay in payment thereof, and of the amount of the profits on the shares which may be forfeited as aforesaid, and also all moneys by them expended in the prosecution of their said work, and shall, once at least in every year, submit such account to a general meeting of the stockholders, until the said road or roads shall be complete, and until all the costs, charges and expenses of effecting the same, shall be fully paid and discharged, and the aggregate amount of such expenses shall be liquidated and ascertained; and if upon such liquidation, or when the capital stock of the said company shall be nearly expended, it shall be found that either of the said capital stocks will be insufficient to complete that respective road, according to the true intent and meaning of this act, it shall and may be lawful for the said president, managers, and company, at a stated or special meeting to be convened according to the provisions of this act or their own by-laws, to increase their number of shares to such an extent as shall be deemed sufficient to accomplish the works and receive subscriptions on original terms, and demand the money subscribed for such shares, in like manner and under like penalties as are herein before provided for the original subscriptions, or as shall be provided by their by-laws.

Sec. 29. *And be it enacted*, That the court of inspection aforesaid shall, at the end of every third year from the date of those incorporations, until two years next after the whole of either of the said roads shall be completed, lay before the General Assembly an abstract of the accounts of the corporations, on the oath or affirmation of the persons intrusted by the companies respectively with keeping of the said accounts, showing the whole amount of their capitals expended in the prosecution of either of the said works, and of the income and profits arising from the said tolls, for and during the said respective periods, together with an exact account of the costs and charges of keeping the said roads in repair, and all other contingent costs and charges, so that the clear annual income and profits thereof may be ascertained and known; and if at the end of two years after either of the said roads shall be completed from the beginning to the end thereof, it shall appear from the average profits of the said two years, that the said clear income and profits will not bear a dividend of ten per centum per annum on the capital stock of the said company so expended, then it shall and may be lawful to and for the said president, managers and company, to increase the tolls herein before allowed so much upon each and every allowance thereof as will raise the dividends up to ten per centum per annum; and at the end of every three years thereafter the said companies shall, on the oath or affirmation of the said persons respectively employed to keep the accounts of the said company or companies, render such like statements to the General Assembly; and if at the end of such triennial period there shall be a surplus of tolls over and above satisfying the aforesaid ten per centum upon all or either of the said roads, the said court of inspection shall have power, and is hereby authorized, to receive such surplus, and to employ the same in purchasing out the stock of the said roads respectively.

Sec. 30. *And be it enacted*, That the General Assembly of Maryland may at any period after all or either of the roads shall have been completed, one year's notice being given to the stockholders, pay all or either of the said companies the amount of the cost of the road or roads of such company or companies, with such an interest thereon as shall make it equal, with the tolls received, to ten per centum, from the investments of their moneys, and that thenceforward the tolls shall be subject to the regulation of the Legislature.

Sec. 31. *And be it enacted*, That the said companies shall cause posts to be erected and continued at the intersection of every public road falling into, and leading out of, the said turnpike roads, with a board and index hand pointing to the direction of such roads, on both sides whereof shall be inscribed, in legible characters, the name of the town, village or place to which such road leads, and the distance thereof in computed miles; and the said companies shall cause mile-stones to be placed at the side of the said road or roads, beginning at the distance of one mile from the bounds of the city of Baltimore, and extending thence to the termination of each or either of

the said respective roads, whereupon shall be marked, in plain legible characters, the respective number of miles which each stone is distant from the city of Baltimore aforesaid; and at every gate or turnpike by them to be fixed on the said road, shall cause the distance from Baltimore, and the distance from the nearest gates or turnpike in each direction to be marked in legible characters, designating the number of miles and fractions of a mile on the said gates or some other conspicuous place, for the information of travellers and others using the said road; and if any person shall wilfully destroy the said posts, boards, index hands or mile-stones, or deface the same, or deface the directions made on the said gates or other conspicuous place as aforesaid, or shall, without permission of the acting superintendent of the said road, throw out upon the road, or within the limits of the same, and suffer to remain for the space of one day, any mould, dirt, weeds, or rubbish of any kind, such person being convicted thereof by the evidence of one or more credible and disinterested witnesses before any justice of the peace of the said county, he or she shall be adjudged by the said justice to pay a fine not exceeding ten dollars, to be recovered, with costs, as debts under ten pounds are by law recoverable, which fine, when recovered, shall be paid to the treasurer of the company, for the use of the said company.

Sec. 32. *And be it enacted*, That all wagoners and drivers of carriages of all kinds, whether of burden or pleasure, using the said road, shall, except when passing by a carriage of slower draught, keep their horses and carriages on the right hand side of the said road in the passing direction, leaving the other side of the road free and clear for other carriages to pass and repass; and if any driver shall offend against this provision, he shall forfeit and pay the sum of ten dollars to any person who shall be obstructed in his passage, and will sue for the same, to be recovered, with costs, before any justice, in the same manner as debts under ten pounds are recoverable.

Sec. 33. *And be it enacted*, That it shall not be lawful for any of the said companies to ask, demand, or receive of, or from any person or persons living on or adjacent to the said road, within three miles of any of the said gates or turnpikes, any toll for passing the said gate more than once in twenty-four hours.

Sec. 34. *And be it enacted*, That no toll-gate shall be erected within the distance of one mile from any of the towns or villages in this act mentioned.

Sec. 35. *And be it enacted*, That either of the said presidents and managers of any of the said turnpike roads for the time being, shall and may, and they are hereby authorized and empowered to grant, demise, and to farm-let, to any person, or persons with whom they can agree, the tolls and duties which they, by virtue of this act or their own by-laws, are authorized to demand and receive for passage in, upon and along, the said road, at any such gate or turnpike, over or upon the same, or any part of the same, for any term not exceeding seven years, under such rents, reservations and conditions, as the said president and managers, at any meeting of their board, shall agree upon, which grants and demises shall have the same construction, force and effect, as other like grants and demises made between private persons have and receive.

Sec. 36. *And be it enacted*, That if, by the termination of any of the said roads, it should so happen that a fractional part may remain, over and above the even ten miles, measuring from the outlines of the city of Baltimore aforesaid, that it shall and may be lawful for the said companies, on the same being completed agreeably to this act, to make application to the Governor and Council, who shall thereupon have the same examined and licensed as aforesaid to receive tolls in the same proportions on the aforesaid fractional part of said road as is hereinbefore allowed to be received on other parts of the said road.

Sec. 37. *And be it enacted*, That all and every provision of this act, so far as the same relate to the Reistertown and Yorktown roads shall remain suspended, and shall not be carried into execution until after the first day of January, eighteen hundred and eight: *Provided*, That the persons named in the third section of this act may, at their discretion, proceed to open books for subscriptions for said roads on the day or days therein directed, or defer to do the same until the first day of January, eighteen hundred and eight; of which determination and day or days appointed, they shall give a previous notice of at least one month in the several papers therein mentioned.

Sec. 38. *And be it enacted*, That the levy court of Baltimore county shall continue to receive all the tolls which are or may be established on the Reistertown and Yorktown roads under existing laws; and the several laws now in force, authorizing the courts of justice to sentence criminals to labor on the public roads of Baltimore county, and the several provisions thereof, shall be in full force and operation until, by the provisions of this act, the property in the said roads shall be transferred to the respective incorporated companies as herein directed, and until provision shall be otherwise made by law.

Sec. 39. *And be it enacted*, That, if the first before-mentioned company shall not proceed to carry on the said work within two years from the passing this act, or shall not complete the same as far as Fredericktown in six years, as far as Middletown in two years thereafter, and to Boonsborough in two years thereafter; and if the two remaining companies shall not proceed to carry on the work in their two respective roads in five years from the passage of this law, and shall not in five years thereafter complete the same, then the right of the said company or companies to such road or roads, not finished as aforesaid, shall revert to the counties respectively.

FIRST SUPPLEMENT.

A supplement to an act entitled "An act to incorporate companies to make several turnpike roads through Baltimore county, and for other purposes." Passed January 19, 1805.

Section 1. Whereas, by an act entitled "An act to incorporate companies to make several turnpike roads through Baltimore county, and for other purposes," passed at the present session of Assembly, a company has been incorporated for the purpose of making a turnpike road from Baltimore to Boonsborough, in Washington county, under the style and name of "The Baltimore and Fredericktown Turnpike Company;" and as it is deemed highly proper to extend the great and important advantages resulting from turnpikes to the citizens of the western part of the State in general; therefore,

Sec. 2. *Be it enacted by the General Assembly of Maryland*, That the said company be authorized and empowered to extend the said turnpike road from Boonsborough to Hagerstown, and from Boonsborough to Williamsport, under the same regulations and restrictions, and entitled to the same tolls and immunities, and advantages, as they are authorized to take and receive by the act to which this is a supplement, provided a majority of the stockholders of the said company shall agree to the extension of said road within two years from their first meeting, and provided the said extension shall be completed in twelve years from the date hereof.

Sec. 3. *And be it enacted*, That, if either of the said companies, in the said original act mentioned, shall not proceed to commence and carry on the work on said roads respectively, within the time limited by said act, or shall not within the time therein also limited to complete said roads respectively, according to the true intent and meaning of the said original act, and this supplement thereto, then, and in either of those cases, all and singular the rights, liberties, privileges, and franchises, by the said original act, or by this supplement, granted on, in, and to the

said road, wherein such default shall have been made as aforesaid, shall revert to the respective counties through which it passes, any thing in the said original act to the contrary notwithstanding.

SECOND SUPPLEMENT.

A supplement to an act entitled "An act to incorporate companies to make several turnpike roads through Baltimore county, and for other purposes." Passed January 25, 1806.

SECTION 1. Whereas it is represented to this General Assembly, that, in pursuance of the powers vested in the commissioners of the Baltimore and Reistertown Turnpike Road, by the act to which this is a supplement, that they have opened subscription books, and that there has been subscribed the amount of the capital stock authorized by said act on said road, and they have petitioned that they may be permitted immediately to commence turnpiking the same; and this Assembly being of opinion that their prayer is reasonable: Therefore,

SEC. 2. *Be it enacted by the General Assembly of Maryland*, That so much of an act entitled "An act to incorporate companies to make several turnpike roads through Baltimore county, and for other purposes," as restrains the President and Managers of the Baltimore and Reistertown Turnpike Road from commencing their work on said road, until the first day of January, eighteen hundred and eight, or that is in anywise inconsistent with this act, shall be, and the same is, hereby repealed.

SEC. 3. *And be it enacted*, That it shall and may be lawful for the commissioners mentioned in the act to which this is a supplement, and they are hereby required, to hold their first election for managers on the first Monday in April next, under the regulations and restrictions, and to be conducted in the manner prescribed in the act to which this is a supplement.

SEC. 4. *And be it enacted*, That the proceedings of the said commissioners, in taking the subscriptions aforesaid, be, and they are hereby confirmed and declared to be as binding on the subscribers as though they had been made on the day or days prescribed in the aforesaid act.

THIRD SUPPLEMENT.

A further supplement to an act entitled "An act to incorporate companies to make several turnpike roads through Baltimore county, and for other purposes." Passed January 25, 1806.

SECTION 1. Whereas, by an act entitled "An act to incorporate companies to make several turnpike roads through Baltimore county and for other purposes," passed at the late session of Assembly, a company has been incorporated for the purpose of making a turnpike road from Baltimore through Westminster in Frederick county, under the style and name of the Baltimore and Reistertown Turnpike Company; and as it is deemed highly proper to extend the great and important advantages resulting from turnpikes to the citizens of the western part of the State in general: Therefore,

SEC. 2. *Be it enacted by the General Assembly of Maryland*, That the said company be authorized and empowered to extend the said turnpike road from Westminster to the forks of the road where Stern's tavern now is, thence on to Taneytown, thence on to Emmetsburg, and thence to the Pennsylvania line, under the same regulations and restrictions, and entitled to the same tolls, immunities, and advantages, as they are hereby authorized to take and receive by the act to which this is a supplement, provided a majority of the stockholders of said company shall agree to the extension of the said road within three years from their first meeting, and provided the said extension shall be completed in twelve years from the date hereof.

SEC. 3. And whereas, by the act passed at the present session of Assembly, it is provided that a new election shall be held for managers of the Baltimore and Reistertown Turnpike Company, on the first Monday in April next, and the election being held on so late a day may much impede the operations of the company: Therefore,

Be it enacted, That it shall and may be lawful to hold the election of managers of the Baltimore and Reistertown Turnpike Company on the third Monday in February next, any thing in the aforesaid act to the contrary notwithstanding.

ELLICOTT'S LOWER MILLS, *9th month.*

Friend JOHN BRICE:

I received thine of the 4th of August last, respecting information, on behalf of the Secretary of the Treasury, on the subject of the Baltimore and Fredericktown Turnpike Road. I have enclosed the turnpike law which authorizes that and other roads leading into the city of Baltimore to be made, together with a plat showing the distance and bearings of the several points as laid down thereon; as also the distance on the old routes, as far as known to our board of managers; also what they might be shortened as far as yet known, and still further. Improvements may probably be made to the westward of Fredericktown, beyond which the survey has not been fully examined, and confirmed. The first contract was made on the first twenty miles, on the 4th of July, 1805, and cost about $9,000 per mile, on an average, and the gates up and toll receiving on the 24th of April, 1807; we have contracted for seventeen miles further, ten of which is now nearly completed, which will cost about $7,000 per mile, including all expenses; and as we get more into the interior of the country, where provisions are cheaper, hope to experience a still further reduction of expense.

It may be observed that, from Boonsborough to Cumberland, a distance of seventy-four and a half miles, as the road now runs, is as yet without any provision by law for its improvement, further than as common county roads in other part of the State, and not laid out on the best ground, in many places which it is capable of; and, to bring into full operation the benefits contemplated by the General Government by the road leading from Fort Cumberland to the Ohio, it becomes necessary that the State of Maryland should either take this matter upon her own account, or put it in the power of Congress to promote a design which it is the interest of the Union to carry into effect.

I am, respectfully,

JONATHAN ELLICOTT.

JOHN BRICE, Esq., *Baltimore.*

[NOTE. The turnpike law, referred to in the within, does not accompany it.]

Answers to the queries respecting artificial roads, so far as relate to the Baltimore and Fredericktown turnpike road, by Jona. Ellicott.

Answer first is shown by the plat herewith enclosed.

Second. The greatest angle from a horizontal line, which has been taken on this road in passing any hill, has not exceeded four degrees; and although the law authorizing this road admits of six degrees over the South mountain, still, as the same force will propel so much greater a load on a four degree hill than the same force would on an angle of six degrees, we shall rather submit to some loss of distance than exceed four degrees to the termination of the road. And from a survey which has been made, it is believed that, from the termination of the road at Boonsborough to Fort Cumberland, no part need exceed four degrees, and the distance be considerably shorter than the present route.

Third. Breadth sixty-six feet through Baltimore and Anne Arundel counties; sixty through Frederick county. The form which seems most approved is, in the greater part of the way, six inches convexity in twenty-two feet; but in particularly level places, and at the foot of hills, nine inches. Depth of stone from ten to twelve inches, broken to pass through a three inch ring. The most approved materials for the stoned part of the road is the hardest kind of black stone. There is a kind of granite which approaching to flint is also very good. Flint will do, but is by no means equal to the foregoing. Limestone will also do, but is not hard enough. The most approved covering on the surface of the road is clean washed sand or gravel from the creeks or rivers. Where the stone are broken to pass through a three inch ring, this kind of a covering makes a road very little inferior, in point of evenness on the surface, to the best gravel, and seems (if I may so term it) to be the proper cement for a stoned turnpike road, which is vastly superior in point of durability, when made of the best kind of stone, to the best gravel road.

Fourth. We have so far made our bridges and culverts, excepting some small culverts, of the same width in the clear, of the stoned part of the road; and, except in two instances, where circumstances forbid of stone arch, the wing walls also arching against the bank, by which means there is a considerable saving of stone work, as much thinner walls will support a given height of bank in this than in the usual way of straight wing walls; and in this way they answer without battering, and the wing walls, circling towards each side of the road, supports the bank without requiring the walls so long as in the usual way. We generally raise our parapet walls about three feet above the surface of the road.

Fifth. No material difficulties do appear.

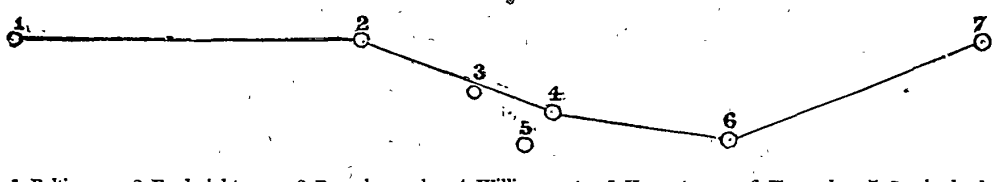
Sixth. Our first twenty miles cost about nine thousand dollars per mile. The next seventeen, which is contracted for, will cost, we expect, about seven thousand dollars per mile, including all expenses. We have, in most instances, contracted for forming and graduating the bed of the road to a survey thereof previously made, and to which survey we strenouously adhere, unless some unforeseen difficulty should arise, which rarely has as yet. That of quarrying, transporting stones or gravel, is so extremely variable as to the kind of quarry from which they are to be taken, the distance of conveyance, the kind of road, &c. &c., that it would be difficult to answer this query with precision. The same observations will apply to breaking stone on the road; the contractors have given from two to six dollars per perch in length of the road, according to the quality of the stone. The most economical way of getting a road made, which we have found at its value, is for those who have the letting of it out to be previously well informed of every different circumstance, of distance of stone from the road, quality of stone, whether to be blown out of solid rock, or to be taken in a loose state from the quarry, or on the surface of the ground, the quantity and distance of every cubic yard of earth to be removed in levelling the road fit for receiving the stone, &c. &c. These bring a number of contractors into competition for the section or miles of road to be contracted for, or any other part of this query; each one judging for himself of all those different circumstances, some one will be likely to perform the service to be done on reasonable terms; if not, the work lays until some person will, which we have not found long. We have given for mason work, in building bridges, from two to two and a half dollars per perch, measuring the solid contents of stone work, and adding one-half the contents of the arch to determine its contents, the mason finding every thing except centres for the arches over eight feet span. The quarry right is also found him; and, in case the stone are hauled above two miles, a reasonable allowance is to be made him for extra hauling. Dry walls are made at one dollar and twenty cents per perch, the mason finding every thing except quarry right.

Seventh. We have now expended about two hundred and sixty thousand dollars, and have five hundred thousand dollars subscribed, which, in all probability, will be sufficient to complete the work to Boonsborough, a distance of about sixty-two miles.

Eighth. The rates of toll are as in the law herewith sent. Our road has been in operation so short a space of time, and that at a season of the year when much the least travelling may be expected, that this query cannot be answered with precision; but have little doubt when it becomes complete to Fredericktown, will yield ten per cent. on the capital expended, without any increase of toll which the law authorizes. It does not appear that any heavy repairs will be necessary, particularly where the road is made of good hard stone.

Ninth. Answered as above.

Straight line from Baltimore to Fredericktown,	42¼ miles;	the road as will be made,	43½ miles.
Straight line from Fredericktown to Williamsport,	24½ miles;	the road as now runs,	27¼ miles.
Straight line from Williamsport to Hancock,	21½ miles;	the road as now runs,	23¾ miles.
Straight line from Hancock to Cumberland,	31¾ miles;	the road as now runs,	40½ miles.
	120 miles.		135 miles.



1 Baltimore. 2 Fredericktown. 3 Boonsborough. 4 Williamsport. 5 Hagerstown. 6 Hancock. 7 Cumberland, or Washington.

Scale of 20 miles per inch.

D. No. 5.

TURNPIKE ROADS IN VIRGINIA.

Manchester Turnpike Road.

1. The Manchester turnpike road commences at Manchester, extending on the principal route from the capital of Virginia into the western parts of this State, Tennessee, and Kentucky, and terminates at Falling creek, a distance of about twelve miles.

2. Road passes over a very level country, particular angle not correctly ascertained; the only hill in the whole distance is made easy for wagons carrying one hundred bushels of coal weighing about four tons.

3. One-half the distance forty feet wide, the residue thirty-six, raised about two feet in the centre, with a ditch on each side, and covered with gravel.

4. One stone arch of moderate size, several smaller culverts of stone.

5. Want of foundation principal obstruction, together with inexperience in the business.

6. The whole road has been finished at an expense of fifty thousand dollars. A contract for the last four miles was made at three thousand dollars per mile, exclusive of stone work, and condemnations of land, and gravel. Stone work may be done at three dollars thirty-three cents per perch, the mason furnishing every thing necessary.

7. This question answered above.

8. Toll for loaded wagons the full distance, twenty-five cents; returning wagons, with less than five hundred pounds, pass toll free. Coal wagons returning pay twelve and a half cents, although empty. Toll for each horse, mule, or ox, for full distance, three cents. Expense of repairs yet unknown, as also net income.

9. For charter, see act of Virginia Legislature, 1801 and 1802.

This road commands so great a portion of the business of the western with the eastern country, that it should merit the attention of the Government. All the produce of the southwestern part of this State, which cannot be transported by the navigation of the James and Appomatox rivers, and of a part of the North Carolina and Tennessee, would take this direction if a suitable extension of improvements could be made. It is a post road, and may be improved for a considerable distance at a very moderate expense. The burden of wagons not being so great as to do much injury after passing the coal works, for whose convenience the road already made was undertaken, the company who have finished this work were desirous of obtaining an extension of their charter to a further distance of ten or twelve miles, but have been discouraged from so doing, since the Legislature of this State have manifested so strong a disposition to repeal or intermeddle in charters.

There is another turnpike road, commenced at the city of Richmond, by a company incorporated under an act of the Legislature of Virginia; but they have made very little progress as yet. This road, however, is intended to unite the coal works of Ross and Currie, on Deep run, a distance of twelve miles from the city, and is constructed, as far as it has progressed, upon the same principles as that of Manchester. A more minute account of it could not be obtained now, as the president, who is the active director, is and has been absent all the summer.

E.

SIR: WASHINGTON, *March* 16, 1808.

I have the honor of your letter of the 29th of July, 1807, transmitting to me a copy of the resolutions of the Senate of the United States of the 2d of March, 1807, together with a list of queries respecting artificial navigation, and canals, to which you request my answer and opinion.

In order to give you all the information on this subject which you wish, and I possess, and in the most condensed form, I ask your permission to depart from the order which your questions demand, and, after treating the subject generally, to enter upon an account of those works, in detail, with which my personal experience has made me more particularly acquainted.

The most striking circumstance, in a view of the Atlantic States of the Union, in relation to the improvement of their internal navigation, is the uniformity of the natural arrangement of the rivers and mountains, and that this arrangement differs from that of every other country in which artificial navigation has been attempted. In other countries the general course of all the rivers is between the mountains and along the valleys; in this the general course of all the rivers is across that of the mountains and of the valleys. Our mountains, from their termination to the southwest in Georgia, hold a course to the east of north; the general direction of our principal rivers is to the east of south; and on inspection of the map it will be observed that, as the direction of the mountains to the northeast of the Delaware becomes more easterly, so do our rivers acquire a more southern course, always crossing the mountains at nearly the same angle.

Our rivers may be divided into three classes:

Primary rivers, that discharge their water immediately into the ocean. Of these the relative magnitude might be rated according to the surface they respectively drain;

Secondary rivers, or such as fall into the first, above their tide water; and

Creeks, properly so called, which rise below the falls of the first rivers, or, rather, collect the water of the level land below the falls, and discharge it into the tide waters.

Of our primary rivers, the Susquehannah is the principal. By a great degree of geographical injustice, this mighty river loses its name at the foot of its falls, and is called the Chesapeake Bay from thence to the ocean; although its width, compared with its length, forbids the term of bay to be applied to what is called the Chesapeake. All of these rivers cross, in the greatest part of their course, the direction of the mountains.

Of the secondary rivers, many of which are of great importance and magnitude, some, and perhaps the greatest number, hold a course parallel to the mountains, as the Shenandoah, the Conogocheague, the Lehigh, &c., draining the valleys, and receiving away the torrents of the mountains.

The third order of our water courses rise either in the lowest ridge of our hills, which I will call the granite ridge, and over which all our principal rivers, from Georgia to the Hudson, fall, and then run through the alluvial country which lies between the granite ridge and the ocean. Such rivers are, the Nottoway, the Blackwater, the Meherrin, the Annacosta, (eastern branch of Potomac,) the Elk river, and the very important creek in the State of Delaware, the Christiana; or they are merely drains of the alluvial country, assuming an appearance of importance below the head of the tide, above which they are mere torrents, almost dry in the autumn. Such streams are all the rivers of the eastern shore of the Chesapeake, and of the lower part of the Jerseys, and innumerable water courses, forming large estuaries in the Southern States.

Our great northwestern lakes, from their first source to the eastern end of Lake Erie, may be considered as part of the great river St. Lawrence, following the direction of the rest of our rivers, until opposed by the northern

extremity of the Allegany. From thence its course follows the valley west of the Allegany, through Lake Ontario, to the ocean, receiving the waters of the northern extremity of the mountain in its course.

This general view of the construction of our country was necessary, in order to understand the general principles on which our artificial navigation can be so conducted as to be useful, or even practicable, and to explain why connexions of waters, which, on the map, appear advantageous and feasible, would be useless, and perhaps impracticable, by any effort of art.

Two principal objects will dictate all the exertions towards the improvement of our internal navigation, which can, for many years to come, be attempted.

1. To carry our produce by water to the nearest port for its exportation, and the importation of foreign articles.

2. To exchange, by internal commerce, the articles reciprocally deficient on lines parallel to the seacoast. Canals, the use of which arises from manufacturing activity, will not probably be soon required.

The first object, as all our principal rivers run seaward, and generally by the shortest course, must be attained by the natural or improved navigation of the rivers themselves, or by canals cut parallel to them. The second may often require a navigation parallel to the valleys, so as to communicate one principal river with another.

The former attempt at improved navigation has already been made on many of our principal rivers; the latter has been seldomer undertaken, and only once above the falls of both primary rivers, in the canal intended to join the Susquehannah and Schuylkill, and the Schuylkill and Delaware rivers, above Philadelphia.

The general construction of our country opposes to artificial navigation, in either of these directions, difficulties, which in no part of the world exist in so uniform and certain a degree. Canals, parallel to our rivers, have three formidable obstacles to encounter and overcome.

1. The rapid descent of the ravine cut through the mountains by the river itself, along which the canal must be carried; or, if the ravine be quitted, difficulties on the high levels, which, the further you go from the river, are always intersected by the more numerous ravines, and embarrassed by the difficulty of returning to the ravine of the river.

2. The invariably rocky nature of the ground, which is uniformly of granite in all its varieties; and the numerous fissures which carry off the water, and require lining.

3. The difficulty of keeping off the land water, and of crossing the lateral branches and torrents of the river.

On the other hand, canals parallel to our mountains must necessarily cross the ridge or spur of the mountain, which divides the waters of two primary rivers. On this ridge, above the falls, the water requisite to supply the canal is always scanty; often there is none; and though a tunnel, or a steam engine, or, in the last resort, a rail-road, are certain means of obviating the difficulty, they are expensive, inconvenient, and imperfect. Below the granite ridge the difficulty is less. There may always be found a supply of water from the ridge itself, and the feeders, though carried through rocky and expensive ground, are themselves useful, as small canals, as far as they extend; and besides, below the ridge the soil is easily cut and embanked.

Having so frequently mentioned the granite ridge, I will here trace its extent as far as my knowledge of our country enables me to do it.

The granite ridge forms the shore of the north side of Long Island opposite to the island of New York. All the south of the island is alluvial, and is the first margin of alluvial soil below the granite ridge. This margin of alluvial soil, beginning at Long Island, widens as it extends to the southwest, until, in Georgia, it becomes more than 200 miles in width. Staten Island and Bergen Point are two spurs of the same ridge, which continues nearly in the line of the post road to Trenton, where the river Delaware falls over it, having worn down the rocks more deeply there than in many other of our rivers. The Delaware runs in its general direction, for 60 miles under the foot of the ridge, as far as Newcastle, leaving it only for a short distance at particular bends of the river. At Philadelphia the ridge crosses the peninsula to Gray's ferry, on Schuylkill. The softer granite of Schuylkill has been worn down so as that the falls are four miles from its lower edge. From Philadelphia, the ridge runs with the post road to Havre de Grace, where it is visible on both shores, although the tides extend six miles above, to the foot of the falls.

The Susquehannah, by the name of the Chesapeake, may be considered as running under the foot of the granite ridge almost as far as Baltimore, which city is built upon the foot of the ridge. At the river Patuxet, on the post road, the ridge appears again, but is lost under the incumbent soil, and is not again visible until it appears at Georgetown. The harder granite of the Potomac has resisted the force of the water more than the granite further to the northeast, and the tide reaches only three miles above its outrunnings. From the Potomac, the falls of Rappahannoc, at Fredericksburg; of James River, at Richmond; Appomattox, at Petersburg; Roanoke, at Halifax; beyond which point my personal observation does not extend, point out the course of this ridge in a line nearly parallel to the Blue Ridge, diverging to the eastward as it extends southward.

I. *Of the improvement of the natural navigation of our rivers leading to the sea, and the canals cut parallel to them.*

The natural difficulties of the navigation of our rivers are, in spring, the dangers of wreck in the wild waters of our rapids; in autumn, the obstructions created by rocky shoals; and, in most of them, rapids and falls impracticable at all times. The least expensive and most obvious means of removing the former, are the blowing of the most prominent rocks so as to straighten the channel, and procure a passage at low water. This has, in almost all our rivers, been attempted, on a greater or less scale, and with various degrees of success; when injudiciously performed, and in rivers of rapid descent, and liable to great variations in the quantity of their water, more injury has been done than advantage obtained. Many of our worst obstructions act as natural dams, which, holding up the water, create a large extent of excellent navigation above them. Of this, the James river, above Westham, and the Susquehannah, above Chickisalunga and Hunter's falls, are instances in point. Such obstructions when removed, let down the water rapidly from above without supplying deeper navigation below. In a river of much magnitude, as the Susquehannah, indeed no gap or sluice artificially cut can materially affect the rapidity of the stream; but, in lesser rivers, great care is required not only to prevent lowering the water above, but to avoid giving a new direction to the current, more mischievous in its effects than that which has been changed. But with whatever judgment the natural navigation of a river, perplexed by rapids and shoals, may be conducted, and however its descent may be thereby facilitated, its ascent cannot possibly be rendered more easy in the same degree. Thus, for instance, although by the moneys expended by the State of Pennsylvania and the Susquehannah Canal Company on the natural navigation of the Susquehannah, below Wright's ferry, it has been rendered much less dangerous to run down the distance of forty-one miles, almost the whole of which is a tremendous rapid from Columbia to the tide, and thereby to carry lumber, iron, and agricultural produce to Havre de Grace, and thence to Baltimore; yet, so difficult is the up stream navigation by the same route, even with the assistance of the Susquehannah canal, that the returns in imported articles have been generally purchased in Philadelphia, and conveyed to Colum-

bia or Middletown, above the rapids, by the Lancaster turnpike, thence to be boated to the country watered by the upper branches of the Susquehannah. And although the Philadelphia market has hitherto offered more advantages to the buyers of imported goods than that of Baltimore, yet the expense of transporting them seventy-two miles by land to Columbia, would, if there were a good navigation from Havre de Grace upwards, destroy this advantage.

The difficulty of carrying canals parallel to our great rivers; the scarcity of engineers possessing knowledge and integrity; the want of capital; and, above all, the erroneous dread of bold measures, and the fear of uselessly expending money in works hitherto unknown among us, has deterred those interested in improving our navigation, from deserting the beds of our rivers, while it was practicable to keep them. They have, therefore, had recourse to canals only where navigation was otherwise impossible—where obstructed by rocks, or broken by a cascade.

There cannot, however, be a reasonable doubt that if in England where, compared with the United States, the quantity of water in the rivers varies little between the dryest and wettest period of the year, a canal running parallel to a river furnishes a much more certain and safe and equal and cheap navigation than the river itself. It is infinitely more the case here. Unfortunately those of our canals which have been cut to pass the rapids and falls of our rivers, partake, in a great measure, of the inconveniences of the rivers themselves; some wanting water when the river is low, some incapable of being entered excepting at a particular height of the water in the river; some subject to constant accumulation of bars, and all of those with which I am acquainted much less useful than the money expended on them ought to have made them.

Those canals of which I now particularly speak, are the James river canal, the Potomac canal, the Conewago and Susquehannah canals. Of the canals north of the Delaware and south of Virginia, I have not sufficient knowledge, nor can I speak of the Appomattox canal. It is, I believe, not liable to the same strictures, in all points, which I shall make upon the others; but, though I am well acquainted with the grounds, I have not seen the manner in which the work has been executed.

One great and fatal error has been interwoven into the scheme of the other canals, excepting only that of the Potomac. They have been dug as much with a view to the erection of mills as to the purposes of navigation. To fit them for mill races, their descent is rapid, and their current strong. They are liable, of course, to the variation of the quantity of water in the river; they bring down with their current the alluvium of the river; bars are formed in them as well by this alluvium as by the land wash; and their banks, where they are not of rock or walled, are liable to perpetual wear by the current. The canal is, besides, itself an inconvenient rapid to those who would ascend it.

Besides these inconveniences, the contracts binding the company to furnish to the millers the water, when it rises above a certain gageselle, for an annual rent, or on other fiscal and permanent terms, binds the canal company to the original construction of the work, and forbids future improvement. For instance, if a lock were found to be useful above the highest mill, it could not be erected, because it would rob the mills below of their stipulated water; the inclination of the canal cannot be lessened, because it would have the same effect. In the James river canal, more than in any other which I have seen, this error, though now generally considered as a very great advantage, will, at some future period, be discovered and deplored. The Potomac canal, more expecially that of the Little falls, has the same defect of a too rapid descent, although the object of a mill race is placed by their charter out of view. But its principal defect is of another kind, to which that of James river is also, but in a less degree, subject. It requires the wash of all the hills and ravines of the north bank, which ought to be discharged through culverts, or carried over bridges; and that legislative impartiality, which has required the canal to enter the river at the very head of the tide, in order that Virginia might have an equal chance of becoming the depôt of its commerce with Maryland, has very much injured its utility to the country at large.

In a still greater degree than the Potomac canal, the Susquehannah canal, beginning at the Maryland and Pennsylvania line, and ending at the head of the tide, has the defect not only of receiving the land wash of the hills and ravines, but also two considerable rivers, the Conewingo and Octararo, partaking thus of all the danger arising from their inundations, and receiving their alluvium. This canal is also applied to the purposes of a mill race. Other inconveniences attend it, which arise from the most unfriendly nature of the river, and the local feelings of the State Legislature of Pennsylvania and Maryland, at the period of the incorporation of the company.

The Conewingo canal, about one hundred and fifty miles higher up the Susquehannah, is also a mill race, and is the property of an individual. It is of difficult entrance, which is to be regretted, as it ought to be the means of passing a short, but very dangerous fall of the river, interrupting a long extent of very good navigation.

Having thus pointed out the general and common defects of these canals, to which I may add the general want of proper slopes to their banks, I will now enter upon the very thankless task of giving an honest opinion respecting them in detail, viewing only the *public interests*, and perfectly conscious of the bearing of what I shall say upon private feelings. These feelings, however, are extremely short-sighted; for nothing could be more advantageous to the individuals, most interested, than those measures which would most benefit the public.

The James river and Appamattox canals stop short of tide water. The most important of these canals is that of James river. Upon the coal mines of James river our Atlantic seaports will soon become dependent for their chief supply of fuel. That dependence exists already, in respect to the fuel required for a variety of manufactures, and even the smiths, within ten miles of our seaports, require already, in order to carry on an advantageous business, a supply of Virginia coal. There are three means (and I think only three) by which the Virginia coal can be brought to the tide: 1st, by a small canal and railroad immediately from the mines south of the river to the shipping tide water at Ampthill or its neighborhood, along the valley of Fall's creek, distance, I believe, twenty miles. This is a route easily practicable, and at a moderate expense; for Fall's creek rises in the coal mines themselves; 2d, by the turnpike road to Manchester, opposite Richmond. This road has been sometime completed, and is of the highest utility; 3d, by James river to the head of the falls, and thence by the canal to Richmond. This is, for two-thirds of the coal country, the best and most obvious route; for from all the mines the coal may easily be brought to the river on railroads, and thence boated, independently of the cheaper conveyance which Tuchahoe creek might be made to yield, to a great extent of coal land now little worked. But of what adequate use is this navigation in boats, carrying at an average two hundred bushels of coal only, when, if the canal were well constructed, one thousand bushels might be as easily and cheaply conveyed, and when, on their arrival at Richmond, they must be unloaded again, loaded into carts, and carried down by a bad road to the tide at Rocket's, to be shipped. The Manchester turnpike, with all its expense of wagons, horses, and drivers, and the consequent waste of *labor, capital, food, and forage*, is a better, and I am told, as cheap a mode of conveyance.

The means by which the canal itself may be made much more useful, I will not consume your time and patience in detailing; what is most important, taking the whole subject into view, is to connect the canal, such as it is, with the tide.

In the year 1796, Mr. Weston, then engineer to the western navigation companies of the State of New York, was called to Richmond to give his advice and opinion on this subject. It amounted to this: to connect the basin with the foot of the falls by a succession of ten or eleven locks in one tier. With all deference to his talents,

I cannot help remarking, that of all expensive projects of which I ever heard, this would have been the most useless; for, independently of the excessive inconvenience and detention which such a tier of locks at the most busy part of a navigation would occasion, the boats would arrive at their foot in a very considerable rapid, now impracticable, and which could only be made practicable by blowing up the rocky bed of the river. When arrived there, two miles of tide water must be encountered, to navigate which these boats are wholly unfit. I cannot help thinking that the present mode of conveying the coal to Rocket's is not much less eligible. I refrain from stating many other objections which are professional, and which I believe were, as well as those already mentioned, as evident to Mr. Weston as to myself; but objections of another nature, more powerful than mere physical difficulties, opposed every project excepting that which he proposed.

In order to connect the basin of James river canal with the tide, a very simple means is offered by the nature of the ground. To do this it will be necessary to form a capacious basin at Rocket's, communicating with the tide by one or more locks. To carry a canal from thence along the level bank of James river to Schokoe creek, a cheap aqueduct of one arch thirty feet span, will carry the work across the creek into the back street. The canal will then go up the back street mounting by successive locks, not more than two in each tier into the basin. The canal from Rocket's to the basin on Shockoe hill should be of nine feet draught of water, and the locks one hundred feet long and eighteen feet wide. This canal would of course bring vessels, which navigate our coasts and bays, and run out to the West India islands, into the basin on Shockoe hill.

The Legislature of the State of Virginia (for the commonwealth is deeply interested in the stock) had, from time to time, expressed great anxiety on the subject of completing this canal. But the dread of unforeseen difficulties and risks in carrying the work below the basin, and the value and productiveness of the stock in its present state, have hitherto overbalanced this anxiety. But, considering Richmond as the principal source of fuel to the cities on our seacoast, at least until the mines of Cape Breton shall supply us, I feel a national sentiment in deeply regretting the very fatal policy which maintains and supports the error and the mutilation of this most important work. I will not, at the same time, deny that when it is considered that those who projected, and have executed the canal, were men of no acquaintance either with general science, or with this particular branch of art, and knew nothing of canals but from books or hearsay, they have already done wonders. They deserve the thanks of their State, and of the Union. But the work should not stop where they have left it. Nature has perhaps done for Richmond more than for any other site where a city has been planted. For ten miles above the city, on both sides, and upon several islands of the stream, there are innumerable mill seats, supplied with water by one of the noblest rivers in the Union. Immediately above the head of the falls lies an inexhaustible treasure of coal. Every art and manufacture to which human ingenuity can employ fire and water may be here carried on with the least expense. From above an easy and wide spreading navigation collects on this spot all the raw materials which our climate can produce; below, a river capable of bearing sea vessels sufficient for every trade, but that across the ocean, is ready for the exportation of its merchandise. The town itself is placed on healthy and commanding ground; but, to improve these advantages to the utmost extent to which our population is equal, nothing would so much contribute as the completion of the Richmond canal.

I have dwelt specially on the coal trade to which this canal is subservient, as of first rate national importance. It is of no less importance to the State of Virginia as a means of conveyance of agricultural produce. As you will receive answers in detail to your queries relative to the amount of all the sorts of produce carried upon it, and of its actual trade, I will not add any thing further to what I have already said on the subject, but to observe that at some distant period the Chickahominy, a river rising in the coal country, and discharging itself into James river, thirty miles below Richmond, where ships may take in their cargoes, offers a means of carrying down the coal destined for distant exportation.

A canal has often been projected for passing the falls of the Rappahannock at Fredericksburg. There is no reasonable hope, however, that this work can soon be executed. The ravine of the river at the falls on either side is so abrupt, rocky, and irregular, that very great expense must be incurred to effect it, an expense not likely to be repaid by its trade for many years.

A canal to connect the Rappahannock with the Potomac, a few miles below Fredericksburg, across the northern neck, has also been spoken of. It would be a highly useful work, but would require a tunnel of two or three miles. I believe it could be executed at an expense not greater than the tolls would remunerate. Such a canal, however, does not belong to the class of which I am now speaking.

The Potomac canal consists of two parts: one to pass the Great falls, fourteen miles above Georgetown, the other to pass the Little falls. The errors committed in the construction of the work have been enumerated above. The trade of this canal, especially during the year 1807, has been so great that there appears every prospect of its becoming a productive work *in those years* in which there is a considerable and equal quantity of water in the river. But upon this circumstance it must always depend. The information respecting it, which can be obtained from the company on the spot, renders it unnecessary for me to say more upon it.

No attempt at the improvement of the navigation of any of the rivers of Maryland, between the Susquehannah and the Potomac has been made, nor is there in the prospects of advantage to be derived from the navigation of the two Patuxets, the Patapsco, or the lesser rivers falling into the Chesapeake, any thing which could at present tempt capital into such undertakings.

But the Susquehannah itself has been for many years the object of almost all the attention directed in the States of Maryland and Pennsylvania to the improvement of our internal navigation; about six miles above Havre de Grace this mighty river meets the tide. The place is now known by the name of Smith's ferry. The map of the river from thence up to Wright's ferry, (Columbia,) in Pennsylvania, which I made in the year 1801, when directing the works carried on for the improvement of the natural bed of the river, and which, by favor of the Governor of Pennsylvania, I am able to exhibit with this memoir, will explain the nature of this part of the river very minutely, being drawn to a very large scale. The whole of this extent is one tremendous rapid, which, in fact, continues to the northwest side of the Chickalunga hills, three miles above Columbia. The rapid is not every where of equal velocity, or equally dangerous. Wherever the river crosses a valley of limestone or slate, the rocks are worn down into a smoother and wider bed; but when it has to cross a ridge of granite, its course is immediately broken by irregular masses and range of rocks; its bed is narrow, and enclosed by narrow precipices, and its torrent furious and winding,

The Chickisahinga falls can be descended without danger, and no attempt to open them has been thought necessary. The ridge of granite hills, through which they break, bounds on the northwest the beautiful limestone valley of Columbia; across this valley the river runs rapidly, but smoothly. Another narrow ridge of granite hills crosses the river immediately below Columbia, over which the river falls rapidly, and then enters the wider limestone valley, known by the name of the Jockara valley. The river spreads here to the width of three miles; its stream is gentle, though rapid, and it abounds in beautiful and fertile islands. It then suddenly contracts, and is received into the narrow ravine which it has sawed down in the granite hill, called Turkey hill. From its first entrance into the

Turkey hill to the tide, there is no part that deserves the name of a sheet of smooth water. When the river is full, the whole ravine, about half a mile in width, contains only one furious torrent, in which few rocks comparatively are to be seen above the water; but the danger is not the less, and very skilful pilots, and many and stout hands are required to carry a boat or an ark safely down. But in the autumn and in a dry season, the river itself can for six miles be scarcely seen, and its bed appears a barren and dry waste of irregular rocks, among which the loud roaring of water is only *heard;* for from the Turkey hill to near the mouth of Conestogo, the whole river is discharged through a channel generally about sixty feet wide, in the greatest part of which the depth and the rapidity of the torrent is such that it has not been fathomed. About a mile below the mouth of Conestogo a narrow limestone valley touches the river on the northeast side; but on the west shore not a trace of limestone is to be seen. Four miles below Burkhalter's ferry, the river arrives at the high range of granite hills, abounding in copper, in which the gap mine is situated, and at a place called McCall's ferry, it narrows to the width of sixteen perches. Here I attempted to find bottom with a line of one hundred and eighty feet, but failed, notwithstanding every precaution taken to procure a perpendicular descent of the weight attached to it. Through this pass the water is rapid, but smooth and safe. The river rises here rapidly, and very suddenly after the fall of rain above; and it will never be possible to erect a safe bridge at this place, so often mentioned as the most practicable. The obstructions to navigation by three rapids below McCall's, is not so considerable as to endanger the arks and boats that descend, until they arrive at the Baldfriar falls, below Peach bottom, and about eight miles above the tide. From McCall's to the slate valley of Peach bottom, the river is filled with islands called the Bear islands. Across the valley of Peach bottom, and above the Baldfriar falls, the river is wide and safe. The best natural navigation, and that always pursued by boats descending by the natural bed of the river, is on the west side from the foot of the Bear islands. Above that point to Columbia the best passage is on the east side. The most dangerous falls below Peach bottom, were Amos and Hector's falls, on which many wrecks annually occurred until the late improvements of the navigation were made.

From this description it may easily be imagined that if the descent of the river, with boats loaded with produce, was dangerous and difficult, the ascent was still more so. The natural obstructions were, besides, increased by fish dams in every part of the river, and the rival interests of the States of Pennsylvania and Maryland prevented for many years every attempt at artificial improvement of the bed of the river. In the mean time each State took measures to go as far towards rendering the navigation of this river useful to their respective interests as their means and limits would permit, and a company was incorporated in Maryland to make a canal from the Maryland line to the tide, to pass all the obstructions in the river of the eight lowest miles; and in Pennsylvania two companies were also incorporated, the one to connect the Susquehannah with the Schuylkill by a navigation taken out above all the dangerous falls, and the other to connect the Schuylkill with the Delaware. The objects of none of these companies were advantageously accomplished. The Susquehannah Canal Company have, however, completed a navigable canal, liable to the objections which I have above noticed. The Pennsylvania companies have made considerable progress in the works under the direction of a very able engineer, Mr. Weston, but have not completed either canal so as to render them at all useful or productive.

At last, in the year 1801, the States of Maryland and Delaware having passed laws incorporating a company for the purpose of cutting a canal between the Chesapeake and Delaware, a former law of Pennsylvania, appropriating $10,000 to the removal of obstructions in the Susquehannah, went into effect; and the late Colonel Frederick Autes, than whom no man was better fitted to accomplish its object, was charged with its execution. But he died on his arrival at the river, and the direction devolved upon me. The enclosed report to the Legislature on this subject details the extent of the work executed, and the principles on which I proceeded in the attempt to make a practicable and safe navigation both up and down the river. I will here only repeat, that all my exertions were bent to force, through all obstructions, a channel, clear of rocks, of forty feet wide, close to the eastern shore, and never leaving any rock, upon which a vessel could be wrecked, between the channel and the shore; so that, in the most violent freshets, a boat should always be safe, by keeping close in shore. Rocks of immense magnitude were therefore blown away, in preference to following a crooked channel, more cheaply made, but more difficult and dangerous, and varying in safety and practicability according to the degree of the rise of the river. There is, however, one part of the navigation in which the bed of the river must forever be pursued, namely, from the Indian Steps above McCall's, to below the Gap at McCall's—a part of the navigation of which, if art can conquer it, must be undertaken in a state of the country infinitely more abounding in wealth and population than at present.

II.—*Of the Chesapeake and Delaware canal.*

Having now answered that part of your inquiry which relates to the general subject of canals, I come to the particular merits of the Chesapeake and Delaware canal, of which you have requested me to give special information, together with my opinion on its location, unbiassed by any interests but those of the public.

The very able report of the committee to whom your letters to the president and directors of the company was referred, and who did me the honor to confer with me on the subject, conveys to you all the information which can be given on the history of the company, their pecuniary resources and difficulties, the motives that directed their choice in the location of the work, and the system under which it was begun and pursued. Every thing, also, that can be collected by the most indefatigable inquiry, as to the probable proceeds of the canal, and the advantages it offers to those who have adventured in it, is also detailed; and there remains to me only the task of giving you that professional information which, as engineer to the company, I have obtained, and to explain to you the means of executing it, as far as they are determined, by the nature of the soil and the levels of the country.

The alluvial land lying below that part of the granite ridge which crosses the peninsula from the ferry opposite to Havre de Grace, and reaches the shores of the Delaware at Wilmington, may be considered as a regular inclined plane, sloping gradually to the southeast at the rate of about six inches in a mile. Immediately below the granite ridge, that is, along the foot of Gray's hill, Iron hill, and along the south bank of the Christiana creek, which runs parallel to and close under the ridge, its highest inequalities seldom exceed eighty feet, nor does the common surface fall below seventy feet above the tide of the Chesapeake at high water. This plane extends from the granite ridge to the ocean, and the only considerable depressions to be found in it are the beds of the land drains, which are worn down into it, and produce the appearance of valleys; but there are no insulated hills whatever, and the valleys are merely depressions of the ground below the plane. Hence it is evident that, by going round the heads of the water courses, a line of canal may be found across the peninsula, between any two points on the opposite bays, in which the variation of level on the summit will be very small; and that, by making the bank out of the spoils of the cut, a canal may be made at the smallest possible expense of digging and removing earth, and at no expense whatever for works in masonry, excepting at each end, where the descent requires the construction of locks; for, by following the ridge dividing the waters which drain into opposite creeks, the necessity of culverts and aqueducts is wholly avoided. The soil is also of the kind most easily cut, being generally a sandy loam on and near the surface, and beds of good clay are found in abundance for all purposes of puddling.

The advantage of so level and soft a surface for the cut is counterbalanced by the total absence of water to supply it. This circumstance is very important in determining the choice of the line of the canal, among so many that are equally practicable; for, as all its water must be brought from the higher grounds upon the ridge, its location ought to be as near to the ridge as possible, in order that the feeder may be short, and the leakage and evaporation of a long feeder avoided. The location of the two ends of the canal does not, however, entirely depend upon its general course along the summit; and a great variety of terminations have been proposed, as equally eligible, both on the Chesapeake and Delaware side. The former, after long and careful examination, has been decided in favor of Welch point, where there has, within the memory of man, been no diminution in the depth of the water, which is below the deposite of alluvium from Elk creek, and where the water is so wide and so deep as to furnish a very capacious basin for many years to come, for the inconsiderable land wash of Back creek, and the small drains in the neighborhood. But on the Delaware side much difference of opinion has prevailed. The summit level of the canal, in every case, must reach the principal road leading from Christiana bridge down the peninsula, near a tavern called the Bear. This place is only two miles distant from Hamburg or Red Hook, on the bay of Newcastle; and a cheap and short cut might be made to either of these points, especially to Red Hook, did not two considerations forbid it—the broad and wild water of the bay, and its shallowness at a great distance from the shore, there being only four feet six inches at low water. Newcastle is the next eligible point. Newcastle is situated on a prominent point, which is swept both by the flood and the ebb tide. There will, therefore, be always deep water at the *outer* wharves and piers at that place, and less than twenty-one feet has not been found on the outside of any of the piers lately erected, or formerly and even at present at the wharves, excepting only where the eddy occasioned by the piers has accumulated soft banks of mud.

There could not be a moment's hesitation in fixing the termination of the canal at Newcastle, unless the following reasons should be thought to outweigh the advantages of the best water in the Delaware, and the shortest navigation across the peninsula, which this point offers. It is, in the first place, feared that, in time of war, when the canal would be invaluable as a means of conveyance of military stores and bodies of men, an enemy's ship of war might destroy the works at Newcastle, in a sudden incursion, and return to sea before the mischief could be prevented. It is further urged, that the mouth of the canal on the river, below the tide, would be liable to be filled up, as are all places on the Delaware where there is an eddy, in a very short time. And it is also alleged, that Newcastle is situated so far below Philadelphia (thirty-three miles) that, unless with a favorable wind, dull sailing vessels cannot reach Newcastle in one tide, when they might reach the mouth of Christiana, four miles higher up the river, and go up the creek with the flood. The first argument appears to me to be deserving of consideration, in a national point of view, and a small fort would be necessary to defend the mouth of the works against an enemy who should attempt to land to blow them up. But they could not be injured, even by shells, beyond the destruction of the gates, which a few hours could put again into repair. To obviate the second objection, it would be necessary to place the tide lock as far out as possible, and to carry out and wharf the side of the canal below the lock as far into the river as the most projected wharf. The line of the wharves is now limited to six hundred feet beyond the lowest street, called Water street, and unless further protruded into the river by a law of the State, this distance presents no formidable difficulty to the work, and places the utmost extension of the wharves beyond the present time. The third objection is not without foundation. But the narrow and crooked navigation of Christiana creek presents infinitely more causes of delay than the distance of four miles in the bold navigation of the Delaware. There is, however, in these objections, enough to render it an object of infinite importance, both to the nation and to the company, to avail themselves of both the eastern terminations of the canal, and to make a cut also from the Bear to the Christiana creek, about three miles above Wilmington, on a line not altogether so favorable nor so short as that to Newcastle, but presenting no difficulties of importance whatsoever. From the point (Mendenhall's) at which the termination is proposed, ten feet may be carried out to the river Delaware. The objections to this termination are—the tedious and very crooked navigation of the creek, for seven miles, to the Delaware; the draw-bridge at Wilmington, which must be passed; but, more than any other, the opposition of the tides of Delaware and Christiana creek: for if a boat comes into the canal at Welch point at high water, and passes across in six hours, she will find half flood in Christiana, and must wait the ebb to go down. On her arrival in the Delaware, in two and a half or three hours, she will have again to wait three or four hours for the flood, to proceed to Philadelphia, or up the Brandywine to the celebrated mills, the interests of which are well worthy of attention. Whereas, a vessel arriving at Newcastle, and finding the flood tide running, which will always happen if she comes to Welch point with a flood tide, may at once proceed up the Delaware, or up the Brandywine or Christiana creek, without delay. It must also be mentioned that, without a favorable tide, it is difficult to work down the Christiana creek against the wind, which is always unfavorable in some reach or other of its crooked navigation; when, on the contrary, there is ample room in the Delaware to use all advantages of wind and tide.

On the other hand it must be urged in favor of Christiana creek, that there is navigable water for boats drawing eight feet, above the proposed termination of the canal, as far as Christiana bridge, and that the navigation may be pushed still higher; that the little town of Newport is now the depôt of the produce of a very extensive and fruitful country, extending into Lancaster county, and is twenty miles nearer to Lancaster than Philadelphia; and that, to connect so important a field of productive business immediately with the canal, it may be worth while to incur an increased expense, and some inconvenience and delay in the mere thoroughfare navigation; and it may be added, that the large fixed capital of the town of Wilmington, far exceeding that of Newcastle, demands from the good policy as well as good will of the company or the nation, some consideration.

Well aware of the thankless task of giving a decisive and honest opinion on either side, I content myself with furnishing the materials of determination to you, and proceed to describe the nature and principles of the work actually executed in the feeder, and proposed for the canal.

Between the waters of the Chesapeake and the Delaware there are three streams which, rising in the high land above the canal, may be brought down to it as feeders: the Christiana creek, the Whiteclay creek, and the Elk itself.

The Elk and the Whiteclay are nearly equal in the regular quantity of water they supply; the Christiana is both smaller and more irregular. The Elk descends in a very crooked and rapid stream, eighty-four feet in four miles from Elk forge to the tide near Elkton, and unites with the wide water of the Chesapeake at Turkey point. The ridge that separates its waters with those of the Delaware, terminates in a high insulated hill, called Gray's hill, which is united to the high land by a low and narrow ridge, crossing the post road on the boundary line of Delaware and Maryland. The Christiana creek is the first water falling from the highland into the Delaware. It collects all the water that fall around the high insulated hill called Iron hill, at the northeast foot of which it turns to the northeast, and running in that direction to the foot of the Granite ridge, into the Delaware, receives the Whiteclay, Redclay, and Brandywine, in its course, and also numerous land drains from the level land to the south-east. Of these three streams it has been ascertained that they may all be brought to the canal, but the Elk with the least expense, and the shortest cut. The valleys in which they all run having been worn in deep and rocky land, and

branching into deep ravines the beds of rapid rivulets, offer great difficulties to the work necessary to divert their course. In the Elk feeder the canal is cut in the rock for about half a mile, and embankments are made across several valleys; but the principal difficulty and expense consisted in cutting through a tongue of high land, called Bellhill, through which the digging is thirty feet for near half a mile, and again through the dividing ridge, to the depth of twenty-five feet for about half that distance; these two difficulties have been conquered. Another smaller hill remains to be cut through; but it may be avoided by a circuitous cut, much less expensive, but also much less eligible. On the Delaware side of the ridge, the feeder is cut through a swampy flat of more than a mile in length, whilst the descent is only six inches. The general elevation of the flat is eighty-six feet above the tide, and as the head of the feeder at Elk forge is only eighty-four feet, it could have little descent, and falls only two inches in a mile. It has, on this account, been made a spacious canal of three feet six inches in water, twenty-two feet six inches on the surface, and twelve feet at the bottom, affording as far as it goes a good and valuable inland navigation. The feeder is six miles in length; at the end of five miles is a lock for the passage of boats, and a side cut to communicate with a reservoir. A continuous valley offers the means of making a reservoir of more than a hundred acres. It has been proposed to embank thirty acres for this purpose. The lock is of ten feet lift. The reservoir will be level with the upper feeder; of course ten feet above the level of the canal, and under such a head, will give the canal as plenteous and rapid supply as wanted. Below the lock the feeder is five feet deep, and twenty-seven feet on the surface of the water; it will join the canal about a mile west of Aikentown. In the construction of the feeder permanence has been a very principal consideration. All the culverts are of solid masonry; no land water can run into the cut, the banks are sloped as two to three, the embankments are well puddled, and the piers of the bridges are of hewn stone.

From the description which I have given of the soil of the peninsula, it is evident that the amount of digging constitutes the chief expense of the canal. To lessen this amount, and to shorten the canal, it is proposed to quit the level in three places, and to cross three land drains that lead into Christiana creek, one at Aikentown, and two between Aikentown and the Bear. Small aqueducts and short embankments only are necessary to effect this. If the canal should terminate at Newcastle, a narrow marsh must also be crossed; if at Christiana, deeper cutting must be encountered. But neither of these difficulties increase the expense of the canal more than $7,500 each, beyond that of the same length of the general cut.

On all other points the report of the committee furnishes ample information; and I will only add, that neither in Europe nor in our own country, do I know a line of inland navigation, which, by so short a distance, and at so easy an expense, unites such extensive and productive ranges of commercial intercourse.

With the highest respect, I am yours,

B. H. LATROBE.

ALBERT GALLATIN, Esq., *Secretary of the Treasury.*

APRIL 1, 1808.

P. S. In the questions proposed to me by you, the subject of artificial roads was comprehended; but being informed by you that the canal companies of Pennsylvania and Maryland had transmitted to you ample accounts of their undertakings, and as in their works, experience has taught a system and mode of execution of the most perfect kind, I have refrained from adding any thing to the information thus acquired. It has, however, occurred to me that a few remarks upon railroads might not be unacceptable to you, especially as the public attention has been often called to this sort of improvement, and the public mind filled with very imperfect conceptions of its utility.

Railroads may be constructed of iron or of timber.

The most durable (but also the most expensive) railroads consist of cast iron rails let down on stone foundations; such roads will last for ages. Cast iron rails secured on beds of timber are sufficiently durable for our country, and of moderate expense. Railroads, entirely of timber, are fit only for temporary purposes.

A railroad consists of two pair of parallel ways, one pair for going and the other for returning carriages; single roads, with occasional passing places, are applicable to some situations, and are of course less expensive. I will concisely describe the road best adapted to the objects that in our country can be attained by it. The rails are of cast iron, and consist of a tread and a flanch, forming in their section the letter L. The tread is three inches wide, the flanch is two inches high. The rails need not be more than five-eighths of an inch average thickness, and they may be cast in lengths of five to six feet. Each rail will, at six feet length, contain two hundred and twenty-five cubic inches, which, at four inches to the pound, is fifty-six pounds each rail, or one hundred weight for every six feet in length of the road, to forty-four tons per mile.

In order to form a road of these rails, they must be laid at the distance of from three and a half to five feet (according to the carriage that is to run upon them) parallel to each other; the ends of every two forming rails, being let and pinned down into a piece of timber lying across the roads; the holes for the pins must be cast in the rails. These pieces of timber may be of any form, provided they are level at the top, and they cannot be a great part of the expense of the road in any situation. The most durable timber is certainly the best; but no timber can be very durable, in the situation it must occupy on the surface, and is partly or wholly covered with earth. The perfection of the road consists in the parallel rails being laid perfectly level with each other across the road, and perfectly jointed. In most parts of the Union the rails could, I think, be delivered at from $80 to $90 per ton, and in many at $60, but taking $80 as the average on the spot, the road will cost—

Rails delivered, forty-four tons at $80,	$3,620
Leveling the road very uncertain; but I will suppose as an average for leveling and filling in with good gravel or broken stone, at $2 50 per perch or per mile,	800
Timber and bedding 50 cents per rail,	440
Incidents and superintendence,	140
	$5,000
For a set of returning ways,	5,000
Total per mile,	$10,000

The carriages which travel on these roads may be of various dimensions agreeable to the material to be conveyed, and the necessary angle of the road. They have low cast iron wheels fast upon the axle, which turns round. Thus the two wheels on the axle make the same number of revolutions in the same space of time; the carriage necessarily goes straight forward, and cannot be thrown off the ways by any small obstruction on one side.

The principle upon which such astonishing loads may be drawn on ways by a single horse, is the diminution of friction in the greatest possible degree. On a good railroad, descending under an angle of only one degree, one horse may draw eight tons in four wagons of two tons each without difficulty. The astonishing loads drawn upon railroads by single horses in England has induced many of our citizens to hope for their early application to the use of our country. I fear this hope is vain, excepting on a very small scale, and that chiefly in the coal country near Richmond; for it is evident that upon a railroad no other carriage but that which is expressly constructed for the purpose, can be employed; and that to render a railroad sufficiently saving of the expense of common carriage, to justify the cost of its erection, there must be a very great demand for its use. But the sort of produce which is carried to our markets is collected from such scattered points, and comes by such a diversity of routes, that railroads are out of the question as to the carriage of common articles. Railroads, leading from the coal mines to the margin of James river, might answer their expense, or others from the marble quarries near Philadelphia to the Schuylkill. But these are the only instances, within my knowledge, in which they at present might be employed.

There is, however, a use for railroads as a temporary means to overcome the most difficult parts of the artificial navigation; and for this use they are invaluable, and in many instances offer the means of accomplishing distant lines of communication which might remain impracticable, even to our national means, for centuries to come.

F.—No. 3.

SIR: WASHINGTON, *December* 8, 1807.

By your letter of the 29th of July, I am happy to find that the attention of Congress is directing itself towards the opening of communications through the United States by means of roads and canals; and it would give me particular pleasure to aid you with useful information on such works, as I have long been contemplating their importance in many points of view.

But a year has not yet elapsed since I returned to America, and my private concerns have occupied so much of my time, that, as yet, I have acquired but very little local information on the several canals which have been commenced.

Such information, however, is, perhaps, at present, not the most important branch of the subject, particularly as it can be obtained in a few months at a small expense, whenever the public mind shall be impressed with a sense of the vast advantages of a general system of cheap conveyance. I hope, indeed, that every intelligent American will, in a few years, be fully convinced of the necessity of such works to promote the national wealth, and his individual interest. Such conviction must arise from that habit of reflection which accompanies the republican principle, and points out their true interest on subjects of political economy. From such reflections arises their love of agriculture, and the useful arts, knowing them to augment the riches and happiness of the nation; hence also their dislike to standing armies and military navies, as being the means of increasing the proportion of non-productive individuals whose labor is not only lost, but who must be supported out of the produce of the industrious inhabitants, and diminish their enjoyments.

Such right thinking does great honor to our nation, and leads forward to the highest possible state of civilization, by directing the powers of man from useless and destructive occupations to pursuits which multiply the productions of useful labor, and create abundance.

Though such principles actuate our citizens, they are not yet, in every instance, aware of their best interests; nor can it be expected that they should perceive, at once, the advantages of those plans of improvement which are still new in this country. Hence the most useful works have sometimes been opposed, and we are not without examples of men being elected into the State Legislatures for the express purpose of preventing roads, canals, and bridges being constructed. But in such errors of judgment our countrymen have not been singular. When a bill was brought into the British Parliament, fifty years ago, to establish turnpike roads throughout the kingdom, the inhabitants, for forty miles round London, petitioned against such roads; their arguments were, that good roads would enable the farmers of the interior country to bring their produce to the London market cheaper than they who lived nearer the city, and paid higher rents; that the market would be overstocked, the prices diminished, and they unable to pay their rents or obtain a living. The good sense of Parliament, however, prevailed, the roads were made, the population and commerce of London increased, the demand for produce increased, and he who lived nearest to London still had a superior advantage in the market.

In like manner I hope the good sense of our Legislature will prevail over the ignorance and prejudice which may still exist against canals. And here an important question occurs, which it may be proper to examine with some attention in this early stage of our public improvements, whether, as a system, we should prefer canals to turnpike roads. Our habits are in favor of roads; and few of us have conceived any better method of opening communications to the various parts of the States. But in China and Holland canals are more numerous than roads; in those countries the inhabitants are accustomed to see all their productions carried either on natural or artificial canals; and they would be as much at a loss to know how we, as a civilized people, could do without such means of conveyance as we are surprised at their perseverance and ingenuity in making them.* England, France, and the principal States of Europe, commenced their improvements with roads; but as the science of the engineer improved, and civilization advanced, canals were introduced, and England and France are now making every exertion to get the whole of their heavy productions water-borne; for they have become sensible of the vast superiority of canals over roads.

Our system, perhaps, ought to embrace them both; canals for the long carriage of the whole materials of agriculture and manufactures, and roads for travelling, and the more numerous communications of the country. With these two modes in contemplation, when public money is to be expended with a view to the greatest good, we should now consider which object is entitled to our first attention. Shall we begin with canals, which will carry the farmer's produce cheap to market, and return him merchandise at reduced prices? Or shall we first make roads to accommodate travellers, and let the produce of our mines and forests labor under such heavy expenses that they cannot come to market?

To throw some light on this interesting question, I will base my calculations on the Lancaster turnpike road. There the fair experiment has been made to penetrate from Philadelphia to the interior country; and the mode of calculation here given will serve for drawing comparisons on the utility of roads and canals for all the great leading communications of America.

From Philadelphia to the Susquehannah, at Columbia, is 74 miles; that road, if I am rightly informed, cost, on an average, 6,000 dollars a mile, or 444,000 for the whole. On it, from Columbia to Philadelphia, a barrel of

* The royal canal from Canton to Pekin is 825 miles long; its breadth, 50 feet; its depth, 9 feet.

flour, say 200 weight, pays one dollar carriage. A broad wheel wagon carries 30 barrels, or three tons, and pays for turnpike three dollars; thus far, each ton carried, the turnpike company receives only one dollar.

I will now suppose a canal to have been cut from Philadelphia to Columbia, and, with its windings, to make 100 miles, at $15,000* a mile; or, for the whole, $1,500,000. On such canal, *one man*, *one boy*, and *horse* would convey 25 tons 20 miles a day,† on which the following would be the expenses:

One man,	$1 00
One horse,	1 00
One boy,	50
Tolls for repairing the canal,	1 00
Tolls for passing locks, inclined planes, tunnels, and aqueducts,	1 00
Interest on the wear of the boat,	50
Total,	$5 00

This is equal to 20 cents a ton for 20 miles, and no more than one dollar a ton for 100 miles, instead of ten dollars paid by the road. Consequently, for each ton carried from Columbia to Philadelphia on the canal, the company might take a toll of six dollars instead of one which is now got by the road; and then the flour would arrive at Philadelphia for seven dollars a ton instead of ten, which it now pays. The merchandise would also arrive at Columbia, from Philadelphia, for three dollars a ton less than is now paid, which cheap carriage, both ways, would not only benefit the farmer and merchant, but would draw more commerce on the canal than now moves on the road, and thereby add to the profits of the company.

But to proceed with my calculation. I will suppose that exactly the same number of tons would move on the canal that are now transported by the road. Again, let it be supposed that, at one dollar a ton, the turnpike company gains five per cent. per annum on their capital of $444,000, or $22,900, consequently, 22,200 tons must be carried, which, at $6 a ton to the canal company, would have given $133,300 a year, or eight and a half per cent. for their capital of $1,500,000.

The reason of this vast difference in the expense of carriage by roads or canals, will be obvious to any one who will take the trouble to reflect that, on a road of the best kind, four horses, and sometimes five, are necessary to transport only three tons. On a canal one horse will draw twenty-five tons, and thus perform the work of forty horses. The saving, therefore, is in the value of the horses, their feeding, shoeing, gear, wagons, and attendance. These facts should induce companies to consider well their interests, when contemplating an enterprise of this sort, and what would be their profits, not only in interest for their capital, but the benefit which their lands would receive by the cheap carriage of manure, and of their productions.

In considering the profit to accrue to a company from a canal instead of roads, there is another important calculation to be made; and for that purpose I will proceed with the Lancaster turnpike, supposing it to extend to Pittsburg, three hundred and twenty miles, on which, the carriage being at the rate now paid from Columbia to Philadelphia, that is, $10 a ton for seventy-four miles, the ton from Pittsburg would amount to $42; at which price, a barrel of flour would cost $4 in carriage, an expense which excludes it from the market. Thus, grain, the most important and abundant production of our interior country, and which should give vigor to our manufactures, is shut up in the districts most favorable to its culture; or, to render it portable, and convert it into cash, it must be distilled, to brutalize and poison society. In like manner, all heavy articles of little moneyed value can only move within the narrow limits of one hundred miles; but were a canal made the whole distance, and by one or more companies, they might arrange the tolls in the following manner, so as to favor the long carriage of heavy articles:

The expense of man, boy, and horse, as before stated, would cost only $3 to boat one ton of flour three hundred miles; this is 30 cents a barrel. Suppose, then, that the company received 70 cents a barrel, or $7 a ton, flour could then come from Pittsburg to Philadelphia for one dollar a barrel, the sum which is now paid from Columbia. Thus, the canal company would gain $7 a ton by a trade which could never move through a road of equal length. Here we see that on canals the tolls may be so arranged as to draw to them articles of little moneyed value; and it would be the interest of the company or companies to make such regulations. But on turnpike roads no such accommodation of charges, in proportion to distance, can be effected, because of the number of horses, which cannot be dispensed with.‡ Even were the roads made at the public expense, and toll free, still the carriage of one ton for three hundred miles would cost at least $35. But were canals made at the public expense, and no other toll demanded than should be sufficient to keep them in repair, a ton in boating and tolls would only cost $3 for three hundred miles; and for $35, the sum which must be paid to carry one ton three hundred miles on the best of roads, it could be boated three thousand five hundred miles, and draw resources from the centre of this vast continent.

But, striking as this comparison is, I will still extend it. The merchandise which can bear the expense of carriage on our present roads to Pittsburg, Kentucky, Tennessee, or any other distance of three hundred miles, and which for that distance pays $100 a ton, could be boated on canals ten thousand miles for that sum.

As these calculations are founded on facts which will not be denied by any one acquainted with the advantages of canals, it is the interest of every man of landed property, and particularly of the farmers of the back countries, that canals should be immediately constructed, and rendered as numerous as the funds of the nation will permit, and the present population requires; and, as inhabitants multiply most towards the interior, and must extend westward, still moving more distant from the seacoast and the market for their produce, it is good policy and right that canals should follow them. In twenty-five years our population will amount to fourteen millions, two-thirds of whom will spread over the Western countries. Suppose, then, that $3,500,000 were annually appropriated to canals; such a sum would pay for three hundred miles of canals each year; and in twenty years we should have six thousand miles circulating through, and penetrating into the interior of the different States. Such sums, though seemingly large, and such works, though apparently stupendous, are not more than sufficient to keep pace with the rapid increase of our population, to open a market, and carry to every district such foreign articles as we near the coast enjoy. With this view of the subject arises a political question of the utmost magnitude to these States, which is, that, as

* On averaging the canals of America, 15,000 dollars a mile will be abundantly sufficient to construct them in the best manner, particularly if made on the inclined plane principle with small boats, each carrying six tons.

† One horse will draw on a canal from 25 to 50 tons, 20 miles in one day. I have stated the least they ever do, and the highest rate of charges, that no deception may enter into their calculations.

‡ In my work on small canals, published in 1796, page 140, there is a table showing a mode of regulating the boating and tonnage in such manner that a ton may be transported one thousand three hundred miles for $5; yet by this method canal companies would gain more toll than by any other means yet practised.

our national debt diminishes, and the treasury increases in surplus revenue, will it not be the best interest of the people to continue the present duties on imports, and expend the products in national improvements?

To illustrate this question, I will state some examples of the rate of duties, and the expense of carriage, to prove that, by keeping on the duties, and making canals with the revenue, goods, in a great number of instances, will be cheaper to the consumer than by taking off the duties, and leaving the transport to roads.

First example.

Brown sugar pays in duty two and a half cents per pound, or for one hundred pounds,	$2 50
It pays for wagoning three hundred miles,	5 00
Total,	$7 50

By the canal, it would cost, in boating, 15 cents for three hundred miles; consequently, the boating and duty would amount to $2 65; therefore, by keeping on the duty, and making the canal, sugar would arrive at the interior, three hundred miles, $2 35 the hundred weight cheaper than if the duties were taken off, and the transport left to roads.

Second example.

One bushel of salt, weighing fifty-six pounds, paid in duty	$0 20
To carry it three hundred miles by roads, the expense is	2 50
Total,	$2 70

By the canal, it would cost, for boating three hundred miles, 7½ cents. By keeping on the duties, and making the canals, it would arrive to the interior consumer 6½ cents the bushel cheaper than were the duties taken off, and the transport left to roads.

Third example.

Molasses pays 5 cents a gallon duty; this is, for one hundred pounds,	$0 75
It pays for wagoning three hundred miles,	5 00
Total,	$5 75

By the canal, the carriage would cost 15 cents, and it would arrive at the interior at $4 10 the hundred weight, or 27 cents a gallon cheaper than were the duties taken off, and the transport left to roads.

Numerous other articles might be stated to show that the real mode of rendering them cheap to the interior consumer is to keep on the duties, and facilitate the carriage with the funds so raised.

These, however, may be considered as partial benefits, and not sufficiently general to warrant keeping on the duties: but there is a point of view in which I hope it will appear that the advantages are general, and will be felt throughout every part of the States. It is by reducing the expense of all kinds of carriage, and thus economise to each individual more than he now pays in duty on the foreign articles he consumes; for example, wood for fuel is an article of the first necessity; it cannot bear the expense of transport twenty miles on roads; at that distance it is shut out from the market, and the price of fuel is consequently raised to the amount of carriage; were a cord of wood carried twenty miles on roads, it would pay for wagoning at least $3; on a canal it would pay 20 cents; thus, on only one cord of wood, there is an economy of $2 80.

Which economy would pay the duty on fourteen pounds of tea, at 20 cents the pound duty; or one hundred and forty pounds of sugar, at 2 cents the pound duty; or fifty-six pounds of coffee, at 5 cents the pound duty; or fourteen bushels of salt, at 20 cents the bushel duty; or fifty-six gallons of molasses, at 5 cents the gallon duty.

I will now suppose a city of fifty thousand inhabitants who, for their household and other uses, will consume fifty thousand cords a year, on which there would be an economy of one hundred and forty thousand dollars; a sum, in all, probably equal to the duties paid by the inhabitants; for the duties divided on the whole of the American people, is but $2 28 to each individual; here I have estimated each person to pay $2 80; yet this estimate is made on one cord of wood to each inhabitant of a city; were I to calculate the economy on the carriage of building timber, lime, sand, bricks, stone, iron, flour, corn, provisions, and materials of all kinds which enter or go out of a city, it would be five times this sum; and thus the towns and cities are to be benefited. The farmer or miller who lives twenty miles from a market, pays at least 22 cents to wagon a barrel of flour that distance; by the canal it would cost two cents, the economy would be 20 cents; at one hundred miles the economy would be 100 cents, and at one hundred and fifty miles it would be 150 cents; beyond this distance the flour cannot come to market by roads; yet, at this distance, the economy of 150 cents on the carriage of one barrel of flour would pay the duty on seven and a half pounds of tea; or seventy-five pounds of sugar; or thirty pounds of coffee; or seven and a half bushels of salt; or thirty gallons of molasses.

Thus it is, that the benefits arising from a good system of canals are general and mutual; therefore, should peace and the reduction of the national debt give an overflowing treasury, I hope you and the majority of Americans will think with me that the duties should not be taken off, nor diminished; for such an act, instead of relieving the people, would really oppress them, by destroying the means of reducing the expense of transport, and of opening to them a cheap mode of arriving at good markets. To proceed with these demonstrations, let us look at the rich productions of our interior country: wheat, flour, oats, barley, beans, grain, and pulse of all kinds, cider, apples, and fruits of all kinds, salt, salted beef, pork and other meats*, hides, tallow, beeswax, cast and forged iron, pot and pearl ashes, tanner's bark, tar, pitch, rosin and turpentine, hemp, flax and wool, plaster of Paris, so necessary to our agriculture, coals and potter's earth for our manufactures, marble, lime, and timber for our buildings.

All of these articles are of the first necessity; but none of them can bear the expense of $5 the hundred weight, to be transported three hundred miles on roads; yet on canals they would cost, in boating, only 15 cents the hundred weight for that distance.

There is another great advantage to individuals and the nation arising from canals, which roads can never give. It is that when a canal runs through a long line of mountainous country, such as the greater part of the interior of America, all the grounds below for half a mile or more may be wanted and converted into meadows, and other profitable culture. How much these conveniences of irrigation will add to the produce of agriculture, and the beauties of nature, I leave to experienced farmers and agricultural societies to calculate. In Italy and Spain it is the prac-

* Animals are now driven to market 300 or more miles at a considerable expense and loss of flesh, principally for two reasons, first, the expense of transporting the salt to the interior, and secondly, the expense of carrying the salted meats to market.

tice to sell water out of the canals for watering meadows and other lands. In such cases tubes are put into the canal, under the pressure of a certain head of water, and suffered to run a given time for a fixed price; the moneys thus gained add much to the emoluments of the canal companies.

But, with all these immense advantages, which canals give, it may be a question with many individuals, whether they can be constructed in great leading lines from our seacoasts and navigable rivers, to the frontiers of the several States, or pass our mountains, and penetrate to the remote parts of our interior country. Should doubts arise on this part of the plan, I beg leave to assure you that there is no difficulty in carrying canals over our highest mountains, and even where nature has denied us water; for water is always to be found in the valleys, and the canal can be constructed to the foot of the mountain, carrying the water to that situation. Should there be no water on the mountain or its sides, there will be wood or coals; either, or both of which, can be brought cheap to the works, by means of the canal. Then with steam engines, the upper ponds of canal can be filled from the lower levels, and, with the engines, the boats can, on inclined planes, be drawn from the lower to the upper canal; for this mode of operating it is necessary to have small boats of six tons each. As the steam engines are to draw up and let down the boats on inclined planes, no water is drawn from the upper level of canal, as when locks are used; consequently when the upper ponds have been once filled, it is only necessary that the engine should supply leakage and evaporation. There is another mode of supplying the leakage and evaporation of the higher levels; on the tops and sides of mountains there are hollows or ravines, which can be banked at the lower extremity, thus forming a reservoir to catch the rain or melted snow. From such reservoirs, the ponds of canal can be replenished in the dry months of summer. This mode of reserving water is in practice in England for canals, and in Spain for irrigation. In this manner I will suppose it necessary to pass a mountain eight hundred feet high; then four inclined planes, each of two hundred feet rise, would gain the summit, and four would descend on the other side. Total, eight inclined planes, and eight steam engines. Each steam engine, of twelve horses power, would cost about $10,000, in all $80,000; each would burn twelve bushels of coals in twelve hours, or ninety-six bushels for the eight engines, for one day's work.

The coals, in such situations, may be estimated at twelve cents a bushel, or, - - -	$11 52
At each engine and inclined plane, there must be five men; total, forty men, at one dollar each, -	40 00
Total,	$51 52

For this sum they could pass five hundred tons in one day, over the eight inclined planes, which, for each ton, is only, - - - - - - -	10 cents.
Suppose the mountain to be twenty miles wide, boating for each ton would cost, - -	20
Total,	30 cents.

A ton for passing over the mountain, which will be, more or less, according to circumstances. These calculations being only intended to remove any doubts which may arise on the practicability of passing our mountains.

Having thus, in some degree, considered the advantages which canals will produce in point of wealth to individuals, and the nation, I will now consider their importance to the Union, and their political consequences.

First. Their effect on raising the value of the public lands, and thereby augmenting the revenue.

In all cases where canals shall pass through the lands of the United States, and open a cheap communication to a good market, such lands will rise in value for twenty miles on each side of the canal. The farmer who will reside twenty miles from the canal, can, in one day, carry a load of produce to its borders; and were the lands six hundred miles from one of our seaport towns, his barrel of flour, in weight two hundred pounds, could be carried that distance for sixty cents, the price which is now paid to carry a barrel fifty miles on the Lancaster turnpike. Consequently, as relates to cheapness of carriage, and easy access to market, the new lands which lie six hundred miles from the seaports, would be of equal value with lands of equal fertility, which are fifty miles from the seaports. But, not to insist on their being of so great a value until population is as great, it is evident that they must rise in value in a three or fourfold degree; every lineal mile of canal would accommodate twenty-five thousand six hundred acres; the lands sold by the United States in 1806, averaged about two dollars an acre; and certainly every acre accommodated with a canal, would produce six dollars; thus, only twenty miles of canal, each year, running through national lands, would raise the value of five hundred and twelve thousand acres at least four dollars an acre, giving two million and forty-three dollars to the Treasury, a sum sufficient to make one hundred and thirty-six miles of canal. Had an individual such a property, and funds to construct canals to its centre, he certainly would do it for his own interest. The nation has the property, and the nation possesses ample funds for such undertakings.

Second. On their effect in cementing the Union, and extending the principles of confederated republican Government, numerous have been the speculations on the duration of our Union, and intrigues have been practised to sever the Western from the Eastern States. The opinion endeavored to be inculcated was, that the inhabitants behind the mountains were cut off from the market of the Atlantic States; that, consequently, they had a separate interest, and should use their resources to open a communication to a market of their own; that, remote from the seat of Government, they could not enjoy their portion of advantages arising from the Union, and that, sooner or later, they must separate and govern for themselves.

Others, by drawing their examples from European Governments, and the monarchies which have grown out of the feudal habits of nations of warriors, whose minds were bent to the absolute power of the few, and the servile obedience of the many, have conceived these States of too great an extent to continue united under a republican form of Government, and that the time is not distant when they will divide into little kingdoms, retrogading from common sense to ignorance, adopting all the follies and barbarities which are every day practised in the kingdoms and petty states of Europe. But those who have reasoned in this way have not reflected, that men are the creatures of habit, and that their habits as well as their interests may be so combined, as to make it impossible to separate them without falling back into a state of barbarism. Although in ancient times some specks of civilization have been effaced, by hoards of uncultivated men, yet, it is remarkable that since the invention of printing, and general diffusion of knowledge, no nation has retrogaded in science or improvements; nor is it reasonable to suppose that the Americans, who have as much if not more information in general than any other people, will ever abandon an advantage which they have once gained. England, which at one time, was seven petty kingdoms, has, by habit, long been united into one. Scotland, by succession, became united to England, and is now bound to her by habit, by turnpike roads, canals, and reciprocal interests. In like manner all the counties of England, or departments of France, are bound to each other; and when the United States shall be bound together by canals, by cheap and easy access to market in all directions, by a sense of mutual interests arising from mutual intercourse and mingled commerce, it will be no more possible to split them into independent and separate Governments, each lining its frontiers with fortifica-

tions and troops, to shackle their own exports and imports to and from the neighboring States, than it is now possible for the Government of England to divide and form again into seven kingdoms.

But it is necessary to bind the States together by the people's interest, one of which is to enable every man to sell the produce of his labor at the best market, and purchase at the cheapest. This accords with the idea of Hume, "that the government of a wise people would be little more than a system of civil police; for the best interest of man is industry, and a free exchange of the produce of his labor for the things which he may require."

On this humane principle, what stronger bonds of union can be invented, than those which enable each individual to transport the produce of his industry twelve hundred miles for sixty cents the hundred weight? Here, then, is a certain method of securing the Union of the States, and of rendering it as lasting as the continent we inhabit.

It is now eleven years that I have had this plan in contemplation for the good of our country. At the conclusion of my work on small canals, there is a letter to Thomas Mifflin, then Governor of the State of Pennsylvania, on a system of canals for America. In it I contemplated the time when "canals should pass through every vale, wind around each hill, and bind the whole country together in the bonds of social intercourse;" and I am happy to find that, through the good management of a wise administration, a period has arrived when an overflowing treasury exhibits abundant resources, and points the mind to works of such immense importance. Hoping speedily to see them become favorite objects with the whole American people,

I have the honor to be your most obedient servant,

ROBT. FULTON.

To ALBERT GALLATIN, Esq., *Secretary of the Treasury.*

10th CONGRESS.] No. 251. [1st SESSION.

BURR'S CONSPIRACY—LETTERS FROM M. NIMMO AND JNO. SMITH.

COMMUNICATED TO THE SENATE, APRIL 8, 1808.

To the Senate of the United States: APRIL 8, 1808.

Agreeably to the request of the Senate, in their resolution of yesterday, I have examined my papers, and find no letter from Matthew Nimmo, of the date of November 28, 1806, nor any other from him, of any date, but that of January 23, 1807, now transmitted with all the papers in my possession which accompanied it; nor do I find any letter from John Smith, of Ohio, bearing date at any time in the month of January, 1807.

Having delivered to the Attorney General all the papers respecting the conspiracy of Aaron Burr, which came to my hands during, or before, his prosecution, I might suppose the letters above requested had been delivered to him; but I must add my belief that I never received such letters, and the ground of it. I am in the habit of noting daily, in a list kept for that purpose, the letters I receive daily, by the names of the writers, and dates of time and place, and this has been done with such exactness, that I do not recollect ever to have detected a single omission. I have carefully examined that list from the 1st of November, 1806, to the last of June, 1807, and I find no note, within that period, of the receipt of any letter from Matthew Nimmo, but that now transmitted; nor of any one of the date of January, 1807, from John Smith, of Ohio. The letters noted, as received from him within that period, are dated at Washington, February 2, 2, 7, and 21, which I have examined, and find relating to subjects entirely foreign to the objects of the resolution of the 7th instant; and others dated at Cincinnati, March 27, April 6, 13, and 17, which, not being now in my possession, I presume have related to Burr's conspiracy, and been delivered to the Attorney General. I recollect nothing of their particular contents. I must repeat, therefore, my firm belief that the letters of Nimmo, of November 28, 1806, and of John Smith, of January, 1807, never came to my hands, and that if such were written, (and Nimmo's letter expressly mentions his of November 28,) they have been intercepted, or otherwise miscarried.

TH: JEFFERSON.

[NOTE.—None of the letters that may have accompanied this message are now on the files of the Senate.]

10th CONGRESS.] No. 252. 1st SESSION.

COMPLAINT OF THE LEGISLATURE OF THE MISSISSIPPI TERRITORY AGAINST PETER B. BRUIN, JUDGE OF THAT TERRITORY.

COMMUNICATED TO THE HOUSE OF REPRESENTATIVES, APRIL 11, 1808.

Resolutions of the Legislative Council and House of Representatives of the Mississippi Territory, relative to the conduct of Peter B. Bruin, presiding Judge of said Territory.

COUNCIL CHAMBER, *March* 1, 1808.

Whereas, the honorable Peter B. Bruin, presiding judge of this Territory, has, for a number of years past, neglected to discharge the duties required by law, and the nature of his office, in frequently failing to hold the superior and circuit courts of this Territory, by reason whereof justice has been most shamefully delayed; and