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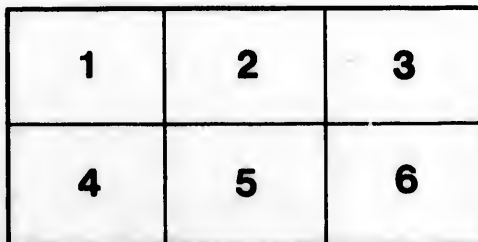
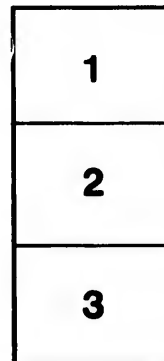
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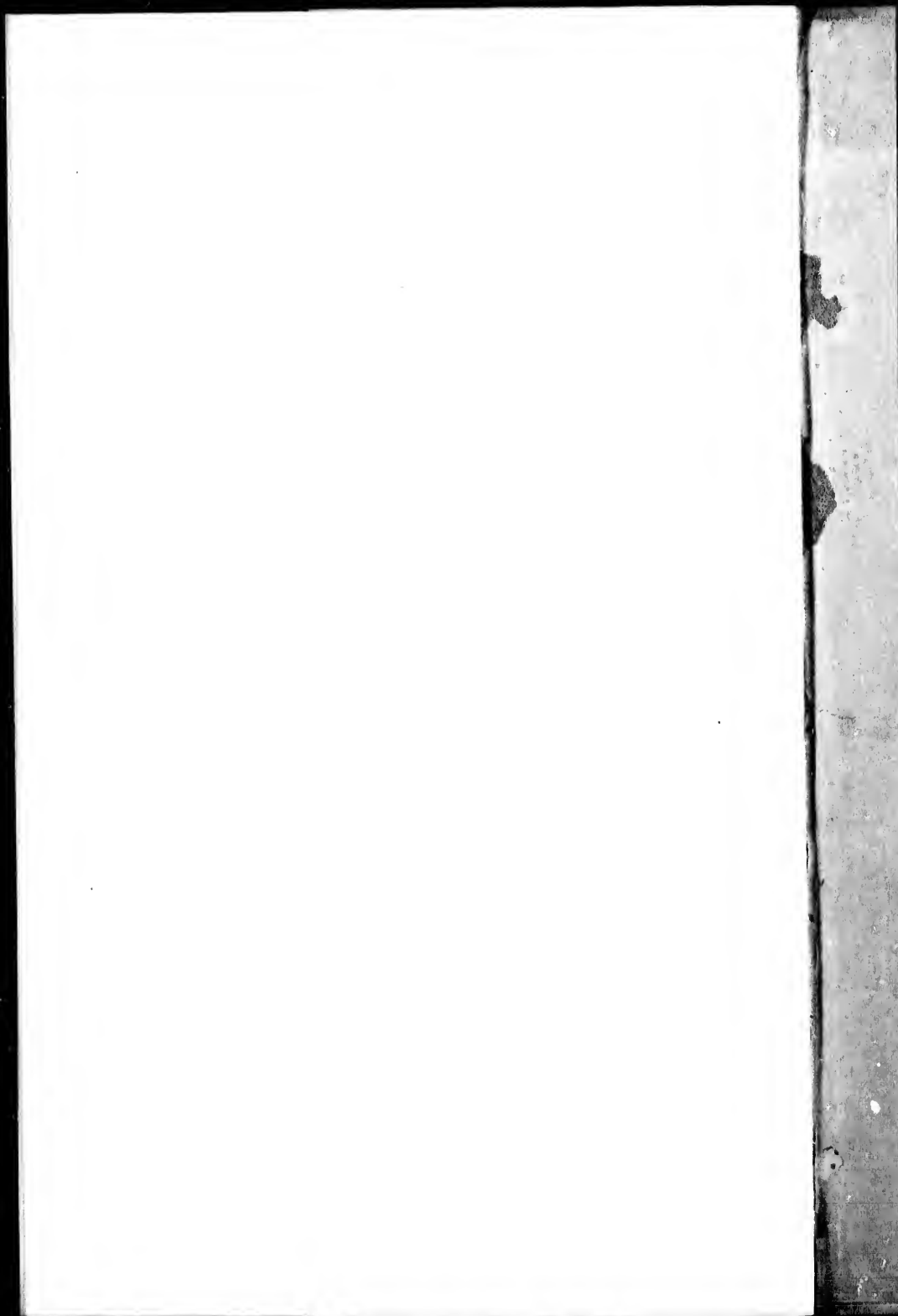
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REPORT
ON THE SURVEY 871E
OF THE
EUROPEAN AND NORTH AMERICAN
RAILWAY:

MADE UNDER THE AUTHORITY OF THE

STATE OF MAINE.

BY A. C. MORTON,
CIVIL ENGINEER.

PORTLAND:
HARMON AND WILLIAMS, PRINTERS.
1851.

1-2278

ENGINEER'S OFFICE, }
PORTLAND, March 24th, 1851. }

TO HIS EXCELLENCY,

JOHN HUBBARD,

Governor of Maine.

SIR :

The appointment, which your Excellency was pleased to tender me as Engineer, to make the preliminary survey of the European and North American Railway, was received on the 29th day of August last, together with a copy of the Resolutions of the Legislature authorizing the survey.

I proceeded at once to make the necessary arrangements to carry out the intentions of the Legislature with as little delay as possible.

On reference to the public archives of the State, it was ascertained that no definite information relative to the topography of the country through which the proposed survey was to be made, could be obtained.

No examination, to any considerable extent, had been made of that portion of the State, between the Penobscot and St. Croix Rivers, except those of a general character, made at an early period in laying off townships, or subsequently attempted in determining the limits of certain lumber districts.

The plans within my reach afforded only an approximate idea of the position of the principal streams and lakes, as roughly laid down

by various persons at different periods, without concert of action or unity of purpose.

With reference to the position and elevation of ranges of high lands—or the general formation of the country—the fall of streams and the relative elevations of different waters—these plans were entirely useless, and afforded no information of any value whatever.

The whole country between the Penobscot and the St. Croix, in a direct line from Bangor towards St. John, was known to be a wilderness, and its character, with reference to the facilities it would afford for the construction of a railway, entirely unknown.

The character and extent of the country to be examined—the advanced period of the year in which the service was to be performed—the absolute necessity of completing it before winter should set in—and withal the limited amount of the appropriation, were considerations which required the immediate and most energetic prosecution of the survey.

Under these circumstances it was deemed advisable to place a competent force in the field, to insure its completion beyond a doubt during the autumn;—and two efficient parties of Engineers were accordingly organized on the 17th of September and directed to commence the survey simultaneously on the Penobscot and the St. Croix, and advance into the interior until they should meet and unite their lines.

These parties were placed under the general supervision of Mr. R. T. Bailey, who was to pass back and forth between them, carefully exploring the country, and giving such directions to the heads of the parties, from time to time, as the nature of the ground should require.

The Resolve of the Legislature required that the survey should be made "from the City of Bangor, crossing the Penobscot river north of the Bangor and Brewer bridge, over the most practicable

and direct route, in a line to the city of St. John in New Brunswick, to the Eastern Boundary of the State, so as to connect there with a railway to be constructed from said city of St. John, to said Eastern Boundary." From the relative position of the coast and of the two points named in the resolution, it was quite evident that a direct line would pass through the interior near the head waters of the various rivers between the Penobscot and St. Croix. This course however could not be pursued by leaving the Penobscot near Bangor, on account of the Brewer mountains, which have a northerly and southerly direction.

This range of highlands however, falls off to the north, and this fact plainly indicated that the most feasible point to leave the Penobscot valley, with a view to avoid these high grounds and to attain a position east of them, which should be on the most direct route to St. John, would be either through the valley of the Great Works or Sunkhaze streams.

This question settled—another arose, which in the early part of the survey caused some embarrassment. While the most direct route, in Maine, towards a given point in the Province of New Brunswick, a distance of 70 or 80 miles east of the Boundary, was to be pursued, another requirement was to be met, which was—such an approach to the Boundary as would permit a junction to be formed with a line to be extended from St. John to the same point, by the most direct and feasible route in New Brunswick. In the early stages of the survey of New Brunswick, a northern route seemed to be the most feasible, if not the only practicable one, between St. John and the Boundary, in the direction of Bangor, and this permitted an approach to the Boundary at two points, to wit: one at Calais or St. Stephens, and the other at the mouth of Canous river, some 10 miles above Grand Falls.

The latter terminus being admitted, a material reduction of distance from that of the former was the result, and presented other

valuable considerations which could not be disregarded so long as the idea of a Northern route in New Brunswick was entertained.

Under these circumstances, and in view of the limited appropriation which at most would permit the survey of but one general route, it appeared important that the line in Maine should occupy a position which would permit a junction to be made at either or both of the above mentioned points, coincident with the survey in New Brunswick. In addition to these reasons, the northerly position attained by the line passing north of the Brewer range of highlands, and the course of the streams and character of the country as determined by the first exploration, afforded strong grounds to believe that a northerly route in Maine, passing near the Scodic Lakes, would not only meet the above requirements, but that it would prove as direct and feasible as any other, if a northern route in New Brunswick was adopted. It also possessed the additional advantage of permitting two termini at the Boundary, the greater portion of the line being common to both.

Subsequently, the survey in New Brunswick was terminated at St. Stephens, opposite Calais, while the observations and explorations made in the progress of the survey, fully demonstrated the feasibility of the route terminating at the mouth of Canouse river, at a reduced distance as connected with the main Northern route in New Brunswick.

The line in Maine was therefore extended to Calais where a junction was formed and our explorations demonstrated corresponding results as it regards the northern terminus at Canouse river, there being a saving of distance on both sides of the Boundary.

The subsequent and unexpected examination of a main Southern route from St John to Calais, somewhat modified this question and induced further examinations on the American side of the Boundary, the results of which will be given in a subsequent part of this report.

It appears proper here to allude thus to some of the causes which influenced the adoption of a northerly route in the present survey, inasmuch as those who became advocates of a more southern route at a late date in the progress of the survey, seemed to think their interests seriously jeopardized. So far from it, the adoption of that course, has been the principal cause in promoting as full an examination of a southerly route, both in New Brunswick and Maine, as circumstances would permit, and although this has not demonstrated the great superiority of one route over another, in Maine, yet it has had a marked result in New Brunswick, tending strongly to establish the fact that St. Stephens and Calais are the most suitable points in every respect for a junction of the proposed lines. Further—that these points, whether the general route as now surveyed in Maine, or a more southerly one should finally be adopted, are on the most direct feasible route between the cities of Bangor and St. John.

In determining on the plan of operation at the commencement of the survey, it was deemed important if possible to pursue such a course as would obtain the largest amount of useful information connected with the great enterprise, with the limited means at hand; and it is believed the result indicates that this, has in part, at least, been accomplished.

With a larger appropriation and more time at our disposal, a broader range would have been taken, and this probably would have been attended with still more satisfactory results.

Under the circumstances however in which the survey was executed, we were necessarily restricted to the simple object of determining whether there was a practicable route from the Penobscot to the St. Croix, on a generally direct course.

In accomplishing this service, the selection of a supposed practicable route was to be made at the outset, for from reasons before stated, we could not retrace lines, much less survey a variety of routes. If

after having surveyed a large portion of the distance, obstacles of so formidable a character were unexpectedly encountered as to require an abandonment of the route, no remedy would be left, as the appropriation would have been exhausted and the season closed. On this account, the difficulties of the service were much increased, and the extent of wilderness country to be examined, together with the prevailing want of information with regard to the geography of this secluded district, rendered the most careful and laborious explorations indispensable.

GENERAL TOPOGRAPHICAL VIEW.

The distinguishing characteristics of the topography of the State of Maine, are its extended coast, its noble harbors and rivers, its numerous isolated mountain peaks, and its beautiful lakes, picturesquely scattered over every portion of its surface.

All that portion of it, east of the Penobscot, is strongly marked by these prominent features. Numerous and valuable streams having their sources generally in the Lakes of the interior, traverse this district of country in various directions, the greater number however tending directly to the coast, while others by a circuitous course running easterly and westerly, finally reach the ocean through the Penobscot and St. Croix rivers.

Nearly the whole of this district of the State, is of the granite formation and the most irregular and broken portion of it is along the coast. As you recede from the coast, the surface of the country becomes more uniform; the hills fall off and gradually unite with the more elevated table lands.

That portion of this district of country lying to the north of a line drawn between the cities of Bangor and St. John, and embracing a region of 20 to 25 miles in breadth, extending from the Penobscot to the St. Croix, includes the head waters of nearly all the

streams flowing southerly to the ocean, but it is more properly the Basin of the Schoodic Lakes. The waters of these lakes extend from the Eastern Boundary of the State to a point about midway between the St. Croix and the Penobscot.

During freshets, these waters commingle with those of the Penobscot, and canoes can pass from one river to the other, a distance of over 70 miles without portage. Although this basin lies considerably north of a direct line to St. John, yet its position and general features are such as to give it strong claims for consideration in the selection of a route for a line of communication to the Eastern Boundary.

If we extend our observation along the southern border of this strip of country, we find that although it includes the elevated country, dividing the waters flowing North and South, yet with the exception of the Brewer hills near the Penobscot, there are no continuous ranges of highlands between the streams running transversely to our course or otherwise, which interpose obstacles of any moment. In fact, we may apply this remark to the whole strip of country above referred to, for nowhere within its limits, are distinct mountain ranges to be found. There are however, occasionally small groups or isolated peaks of considerable elevation, yet they are more regular in their outlines than those along the coast, and are seldom of a precipitous or Alpine character.

Approaching the St. Croix, south of the Schoodic Lakes, the country is more irregular than that in the vicinity of the Penobscot, and the high grounds are often covered with a hard wood growth and are susceptible of tillage.

The country south of a direct line between Bangor and St. John, assumes a different character. The streams are larger, the valleys deeper, and the intervening ridges are elevated, precipitous and rocky. The general surface of the country is irregular and broken, with no extended table land, plains, or valleys which would facilitate the construction of a Railway at reasonable expense.

The lumber of this portion of the country is principally removed and the soil is of a less fertile character than that north of this line.

Examining more minutely the topography of the district which was more particularly our field of observation, we find that in a direct line from Bangor towards St. John, the Brewer hills would present an obstacle of a somewhat formidable character. A few miles above Bangor we find that several streams enter the Penobscot from the east, having turned the northern flank of these hills, and opened by their valleys a tolerably direct and favorable means of reaching the interior without encountering this obstacle.

The more southerly of them, the Sunkhaze and Great Works streams, early indicated that a line of survey in an easterly direction would naturally fall into one of these valleys.

Further up the Penobscot, the Olammon and Passadumkeag rivers enter from the east, the latter being a large and valuable stream having its source near the Schoodic waters. The northerly position of the latter two rivers rendered them unavailable for the purpose of the present survey, having reference to a direct route easterly, but they clearly indicated the general slopes and tendency of the drainage of the country immediately west of the Schoodic waters.

The head waters of the Sunkhaze and Great Works streams "interlock" with some of the tributaries of Union river, which runs southerly and nearly parallel with the Penobscot, to the Ocean. The extreme source of Union river is in township No. 40, near Nicatous Lake, from which point it has a westerly direction through this and township No. 39. Nicatous Lake is situated partly in townships No. 40 and 41, and is of considerable extent, covering some eight square miles. Its outlet runs north, and forms one of the sources of the Passadumkeag river. About midway of this Lake, are the "Narrows" which are formed by a point of land extending out into the Lake till it nearly reaches the western shore, thus reducing its width from two miles to three hundred feet.

This lake occupies a position transversely to the course which would be followed by any survey from the Penobscot towards the Eastern Boundary of the State, and the peculiar feature above referred to, offers the means of crossing it at moderate expense.

The largest inlet of this lake is on the east side, and near the point of land forming the narrows, which with its tributary, Freese brook, forms a valley extending in an easterly direction nearly to the waters of the East branch of the Machias river. Another stream enters the south end of the Lake, which has its rise in a small pond in township number 39 where there are several other small sheets of water known as the Sabio Lakes, which form the sources of the west branch of Machias river flowing south easterly.

The east branch Machias river forms a singular feature in the topography of the country. It has its source in five lakes, four of which are situated at the four corners of township No. 42. These lakes are known by their numbers, commencing with the most southern which is called "First Lake."

Fifth Lake is situated at the south west corner of the township and its outlet runs north to the north-western corner where it enters Fourth Lake, thence the outlet of this lake runs east till it enters Third Lake. This is the largest of these lakes, and is about six miles in length and from one half to three fourths of a mile in width. Its outlet runs nearly south, passing through the two remaining lakes, which are of less extent, thence bearing south-easterly, reaches the ocean in a distance of some 30 miles. These lakes, with their connecting streams nearly surround township number 42, and their waters run to almost every point of the compass. The ground enclosed by these waters is elevated and broken, two points rising to a considerable elevation and cover the larger portion of the township. There is a valley between these elevated peaks, the greatest elevation of which is 370 feet above tide water. These lakes vary in elevation from 275 feet to 380 feet above tide

and at their extreme northern bend approach very near to the Schoodic waters.

The latter waters are known under the general appellation of "Schoodic Lakes," yet all have their particular names; the principal of which are Genesegarnagum and Grand Lakes. The latter is some 80 or 100 feet above the former, and its outlet, which is from two to three miles in length, is known as Grand lake stream.

Lake Genesegarnagum is about 200 feet above tide, is some ten miles in length and two to four miles in width. Taking the Schoodic Lakes together it is probable that they cover an area of 100 square miles. Further east and south, there are Princeton, Meddybemps, Chain Lakes and numerous others which are mostly the sources of rivers running southerly.

The valley of the St. Croix is bordered on the New Brunswick side by elevated grounds. There are however, two streams of considerable size which break through these grounds, one of which enters the St. Croix at St. Stephens, and is known as Dennis' stream, and the other, Canouse river, running more westerly, unites with the St. Croix about ten miles above Grand Falls. The mouths of these streams are referred to as points of some importance as will be seen hereafter.

The St. Croix is a large river and on account of the character of its sources and its numerous falls as it approaches tide water is unusually valuable as furnishing great manufacturing facilities. Besides its importance in this respect, it assumes a prominent position from its constituting the Boundary between the United States and the Province of New Brunswick.

DESCRIPTION OF THE LINE.

That part of the route between Bangor and Oldtown having been carefully surveyed and the results published, it did not appear important for the present purpose, that this should be resurveyed.

I have therefore deemed it unnecessary to do more than to present such general information relative to the feasibility of this part of the route, as may be gathered from the published report of that survey.

The distance from the city of Bangor to Milford, opposite Oldtown, is 13 miles. The line follows the west side of the valley of the Penobscot for the whole distance, and is generally found to be favorable.

At a place known as Thompson's Point, four miles from Bangor, the Penobscot river makes a circuit southward, thence it sweeps around westerly till it reaches the "Red Bridge." Two lines have been surveyed from this point, one following the windings of the river and the other by a more direct course avoids the bend in the river, and saves three fourths of a mile in distance. Following the river from Bangor to Oldtown and Milford, the grades are either level or descending, in the direction of Bangor, for the whole distance, and no grade exceeds twenty-five feet per mile. Following the interior route there will be one gradient of 41 feet per mile for a distance of one and three fourths miles, ascending in the direction of Oldtown, and one of ten feet per mile ascending in the opposite direction. On the remaining portion of the distance, the grades coincide with the other line.

In view of the general character of other portions of the route between the Penobscot and the St. Croix, and the important saving in distance effected by the interior route, it is probable that on a more full examination it will be found preferable, and in making up the distance from Bangor to Milford, this line has been adopted.

The cost of this portion of the line will probably be above the average, in consequence of the irregularity of the grounds bordering the river, and the necessity of building massive protection wall at various points, and the greater extent of bridging.

The point selected for crossing the river at Milford, is in every respect favorable.

In leaving the valley of the Penobscot, two routes present themselves, one through the valley of the Sunkhaze, and the other through the valley of the Great Works stream. These routes would not probably unite until they reach Union river.

In this as well as all other similar questions of routes which subsequently presented themselves for consideration, we were governed in making a selection, by the greater probability of success as indicated by the size and position of the streams traversing the country. The Sunkhaze being a larger stream than the Great works, and penetrating further into the interior, its sources nearly reaching those of Dead stream, a tributary of Union river, running easterly, seemed to point it out as a route affording greater hopes for success in the trial line which could only be run at this time, and it was accordingly adopted. It was ascertained by explorations that favorable grounds in the direction of the head waters of the Sunkhaze, would permit the line to leave the Penobscot nearly opposite Oldtown and not approaching very near the former stream, except at one point till it was crossed in township Number 32, a distance of about 8 miles from the Penobscot.

The survey was commenced at the village of Milford, and following near the river for about half a mile, in order to pass some high ground in its immediate vicinity, thence curving easterly it leaves the river and bears nearly east on a straight line, for 6 miles, to the crossing of Birch stream, a tributary to the Sunkhaze. This stream, at the point of crossing, is elevated considerably above the immediate country crossed by the line. In approaching it a heath is crossed of about one and one half miles in extent, on the easterly side of which the ground rises rather abruptly to an elevation above it of 65 feet, which forms the western bank of this stream.

There is some curvature required in crossing it, after which however, the line continues on, in nearly the same general direction, leaving the stream, which here runs northerly, and crossing undu-

lating ground, it ascends to the more elevated country bordering the Sunkhaze stream.

It will be observed by reference to the profile of the line, that between the heath above mentioned, and this stream there are grades of 40 and 45 feet per mile for about three miles.

From the Penobscot to the point where the Sunkhaze is crossed, a distance of nine miles, the line is straight, with the exception of some little curvature at Birch stream. It is a question however, whether it would not be advisable in leaving the Penobscot, to adopt a line diverging northerly from the one run, which will carry the road on more firm ground north of the heath, and reach the valley of Birch stream at a point further to the north, thus approaching the elevated grounds in its vicinity, in a more favorable position, and skirting along the valley southerly for a short distance before leaving it, would probably not only avoid some heavy cutting, but somewhat develop the line, and consequently reduce the inclination of the gradient below that required on the more direct line now surveyed. More particular examination of the ground will enable a proper decision to be made as to the best course to be pursued in the location of the road between these points.

The Sunkhaze stream is crossed by a bridge of 30 feet span, after which the line follows up the valley of this stream nearly to its source, thence it crosses to the waters of Dead stream, which flow easterly and enter Williams Pond. This pond is in the town of Tilden, which with Brandy Pond in township number 30, and Alligator Pond in township number 34, forms the principal source of Union river.

The line crosses Dead stream, and continues nearly an east course, crossing a slightly undulating country to the waters of Union river, a short distance above Williams pond. This point is 18 miles from the Penobscot river at Milford, and is elevated 205 feet above it at that place. The greatest intermediate elevation passed

over is 257 feet above the same base. The general direction of the line is good, and but a small amount of curvature is required. The principal obstacle encountered is the heath before referred to, which in some parts was found to be soft, with a great depth of unstable vegetable matter. It is believed however, that this may be mostly avoided in the manner before described, and this without much increase of distance or curvature.

It is proper here to remark relative to a more southern route, via the Great works stream, that the position of the branches of this stream indicate that there may be two routes by which the waters of Union river may be reached.

One following the northerly branch in the direction of the Sunkhaze at the point where it crosses into the township of Bradley, there uniting with the present line, and the other pursuing a south easterly course through the valley of one of the larger branches, to the northerly part of township number 32, where it would intersect the line surveyed, in the valley of the Sunkhaze, or reach the waters of Dead stream by a more southerly course, and thence descend to Williams pond, uniting with the line now surveyed.

Circumstances did not permit us to either survey or explore these routes, but should future examinations demonstrate their practicability, either will probably reduce the distance below that by the way of Sunkhaze route. In any surveys which may be made for this work hereafter, the country traversed by this stream, and the northern and central portions of township number 32, should be thoroughly examined.

The line as now surveyed, having reached Union river, bears northerly, following up that stream to Brandy pond, thence along the southerly side of that pond, and its inlet, crosses township number 40 and reaches Nicatous Lake at the "Narrows."

Union river is crossed at a point near where the Alligator branch of that stream enters, and will require a bridge of 100 feet span.

This point appears to be the most natural divergence for a more southerly route, which will be described in a subsequent part of this report. By reference to the general map herewith submitted, it will be observed that between the point of crossing the Sunkhaze in township No. 32, and Brandy pond in township No. 39, the line makes a detour to the south. With a view to avoid this, some explorations were made to the north, but not sufficient to determine the practicability of a more northerly route. As indicated on the map, a saving in distance of about one mile would be made, should it prove practicable.

The "Narrows," as they are termed, at Nicaous Lake, present, as I before intimated, a remarkable feature in the topography of this vicinity.

They are formed by a long narrow point of land running out into the lake from the east, of nearly one mile in length, and by several small islands in the same range. The extent of bridging required at this place, will not probably exceed 275 feet, and possibly may be reduced to one span of 130 feet, the remaining portion being filled in permanently by embankment.

The point of land which forms the narrows occupies a favorable position, not requiring the general direction of the line to be varied in crossing the lake in the most advantageous and economical manner.

From Union river to the east side of this Lake, a distance of ten miles, the country is of a highly favorable character, the grades are either level or of moderate inclination,—the line is straight for the greater portion of the distance, and the work is light.

Soon after leaving the narrows the line crosses Casabeus stream, which is the outlet of a lake of the same name connecting it with Nicaous lake: thence it bears more southerly, strikes across the country to the valley of Freese brook, a branch of the last mentioned stream, which it follows for a short distance, thence it curves southerly, passing along the base of Machias mountain to Fifth lake

stream, which forms the east branch of Machias river. From the narrows to this point, the distance is about six miles, embracing township number 41, which the line crosses from west to east, dividing it into nearly equal parts. The ground, for the whole distance, may be regarded as favorable, admitting of easy gradients and light work.

Near the centre of this township there is a favorable point for the divergence of a southern route, should the route before referred to, diverging at Union river, prove unfavorable.

After crossing township No. 41, we encounter the most difficult portion of the Northern route, which falls within townships No. 42 and 43.

The five lakes constituting the source of the east branch of west Machias river, nearly enclose township number 42.

In this township and in portions of Nos. 43 and 37, more irregular and broken ground is found, than in any other portion of the route. The Machias waters having performed this circuit, break through these elevated grounds in the south-western part of township No. 43.

The question as to the best route to follow in crossing township No. 42, was involved in much doubt, and although there were three routes which appeared practicable, yet it was impossible to determine satisfactorily by exploration only, which was preferable.—Circumstances did not permit us to survey all, and in this instance, as in a number of others, subsequent instrumental examinations increased our general knowledge of the topography of the country, and developed features which afforded evidence that in balancing the merits of various subordinate routes, the best were not in every instance selected.

The route which was adopted by the survey after crossing Fifth lake stream, follows along its bank, running northerly for about one mile, thence curving easterly, it reaches the valley of a small

stream running northerly into Fourth lake, which it follows to its source, thence it strikes across to the head of Fletcher's brook running southerly into Machias river, which it follows to the south line of township No. 42, thence curving easterly leaves the valley of this brook, and running easterly, passes into the south-west corner of township No. 43, where it crosses the east branch of Machias river, thence ascending along its east bank, attains the dividing ridge between the latter stream and the Schoodic waters. A more southern route, passing the high grounds in number 42, will on examination probably be found nearly or quite as favorable as the one above described, which would bear southerly, following up Fifth lake stream to Fifth lake, thence along the north shore of the latter to its head, thence by an easterly course cross Fletcher's brook and unite with the other line near Machias river. A northern route is practicable, which would pass to the north of the high grounds in number 42, and cross Third lake at the "Narrows," thence bearing southerly ascend to the summit in township number 43 where it would unite with the line first described. This route, while it would probably avoid, to a considerable extent, the elevation encountered by the other two routes in townships 42 and 36, would also approach the summit in number 43 by a more favorable direction, yet it encounters the expense of crossing Third lake which possibly may prove a somewhat formidable obstacle. We were unable to make sufficient examination to determine whether this could be accomplished within reasonable cost. It is known that there are a number of small islands in the lake at this place, and the appearances indicate that the water is shoal.

As the line actually surveyed, crossing townships number 42 and 43, requires heavier grades for several miles than are necessary in any other portion of the line with one exception, between the Penobscot and the St. Croix, and the route by Fifth lake requires nearly the same maximum grade, it renders any other route which

will permit a reduction of these gradients, a matter of much importance, even though other difficulties involving greater cost should be encountered.

These routes are indicated by the broken and full red lines on the map, and will doubtless hereafter receive due consideration in determining the final location of the road.

Descending easterly from the summit in township number 43, a grade of 53 feet per mile is required for 12,100 feet. The cutting at this summit contains 160,000 cubic yards, a considerable portion of which will be rock.

In descending to Musquash brook with this inclination, an embankment of considerable magnitude is required. There are favorable points from which the material needed for this work may be taken.

From this brook to the dividing ridge between Lake Genesegarnagum and Princeton lake, a distance of eight miles, the line is mostly straight, and the ground generally favorable. This portion of the line is in townships 21 and 27, and crosses Big and Little Walamatogue, Clifford's and Scott's brooks, all of which are small streams, running northerly, not requiring bridges of greater spans than from 20 to 50 feet.

As the line approaches township number 21, it bears north east, descending to the head of Princeton Lake, thence it bears southerly passing from the centre to the south east corner of the town of Princeton, near which point it reaches the head of Whapskenegan brook, which it follows to the St. Croix river, and thence along the west bank of the latter stream to Baring, where it intersects the Calais and Baring Rail Road. This distance is 19 1-2 miles, and includes the towns of Princeton, Baileyville and part of Baring. No points of great expense for construction are encountered on this portion of the line, and the grades, with one exception, are moderate.

In descending to the valley of Allens stream, at the west line of

Princeton, there is an inclination of 52 feet per mile required for a distance of about one and one quarter miles. This may, by more thorough examination, be reduced to 40 or 45 feet per mile.

Explorations were made with a view of passing the south side of Princeton Lake, but no feasible route could be found except at a very great increase of distance.

With Calais as a terminus or point of junction with the Provincial portion of the road, this detour of the line, to the north of Princeton Lake, constitutes an unfavorable feature in this route. From Baring to Calais, a distance of 5 3-4 miles, the line of the Calais and Baring Rail Road was adopted.

The work on this road was in an advanced state at the date of our survey. The track is now laid and the road is in operation.

I am indebted to S. R. Hanscomb, Esq. the President of that company, for a copy of the map and profile of that road, which put me in possession of full knowledge of the grades, curvatures, &c., &c., from Baring to Calais.

The distance from the Penobscot river at Milford, to the St. Croix near the mouth of the Whapskenegan creek, is 72 miles, and the total distance from the City of Bangor to Calais is 95 1-2 miles. The highest ground passed over is in township number 43, although nearly the same elevation is attained in 42.

The greatest elevation of grade in these townships, is 388 feet each above tide, with an intermediate depression of 92 feet.

The maximum grade, 53 feet per mile, is required to surmount the elevated grounds in these townships. The most objectionable curvature on the line, and the points of greatest expense, are also here encountered.

From the nature of the country, and the position of the streams between the Penobscot and the St. Croix, there are several subordinate summits to be passed, and in arranging the gradients so as nearly to conform to the surface of the ground, requires frequent un-

dulations. The aggregate rise in either direction is 927 feet, but there is a greater aggregate extent of maximum grade ascending westerly than in the opposite direction.

The following is a synopsis of the grades of the whole line from the city of Bangor to Calais, following the middle route, and adopting the surveys previously made for that portion of the line between Bangor and Milford, and between Baring and Calais.

Level road,	26.34 miles.
Grades not exceeding 10 feet per mile,	13.95 "
" from 10 to 20 " " "	12.08 "
" " 20 to 30 " " "	14.45 "
" " 30 to 40 " " "	14.23 "
" " 40 to 45 " " "	9.20 "
" of 53 feet per mile,	5.20 "

From the above, it appears that for 70 per cent. of the whole distance, the grades do not exceed 30 feet per mile—on 40 per cent. they are less than 10 feet per mile, and 23 per cent. of the whole road will be level. It is probable that by a more thorough examination of the country, the grade of 53 feet per mile, may be reduced to 45 feet.

From 75 to 80 per cent. of the whole line will be straight and the minimum radius of curvature will not be less than 1,400 feet.

ESTIMATE.

The estimates contemplate only a single track with a proper allowance for turns out, and is based on a width of road bed of 25 feet in cuttings and 15 feet on embankments. It also contemplates a reasonable degree of permanency in the various structures, aiming rather at the useful and substantial than ornamental.

The masonry for the large and more important bridges is supposed to be hammer dressed with rough or quarry faces and

laid dry. That of the smaller class of bridges and culverts to be of good substantial rubble masonry. The superstructure of bridges to be of the general character of those on the Portland and Montreal road.

The road bed is supposed to be elevated from 4 to 6 feet above the surface of the ground at all points where practicable. This is of great importance, for it effectually prevents any difficulty from an accumulation of snow, secures good drainage and adds to the stability and usefulness of the road in every other respect.

The different kinds of work are estimated at prices corresponding with those for similar work in this State, with a proper allowance for the difference of circumstances under which the work must be executed.

The estimate of the track, contemplates a rail of an approved pattern, weighing not less than 100 tons to the mile, and the use of the various kinds of timber found on every portion of the line, such as Hachmetac, Cedar and Pine. The track to be embedded in ballasting of clean gravel which should cover the road-bed to a depth of not less than two feet. This item is included in the cost of track. The iron is estimated at \$50 per ton, which is above the present price. Whatever variation there should be in the price of this article from the above, will of course vary the cost of the track.

The machinery estimated, is sufficient for the business of the road for one or two years, but additions will be necessary from time to time, as circumstances may require. The Station Buildings embraced in the estimate, are of a plain character, all being of wood, except the engine houses, repair shops and water stations.

It is believed that at each end of the line, the buildings to a certain extent will be erected and lands purchased at the joint expense of the different companies whose lines unite, and to be used in common.

ESTIMATE.

ITEMS.	Quantities.	Prices. \$ cts.	Amount. \$	Aggregate. \$
Clearing and Grubbing,	. . . . .	. . .	50,000	50,000
<i>Earth Work.</i>				
	Cubic yds			
Excavation earth, includ'g haul,	2,856,000	36	856,800	
do. sold rock,	200,000	1,00	200,000	
do. loose rock,	88,000	60	52,800	
do. pit,	72,197	35	25,269	1,134,869
<i>Masonry.</i>				
In Bridges, Abutments & Piers,	30,000	6,00	180,000	
" Culverts,	28,710	3,00	86,130	
" Protection Walls,	51,952	1,50	77,928	
Bridge and Culvert Foundat'ns,	. . . . .	. . .	50,000	394,058
<i>Bridge Superstructure.</i>				
	Linear ft.			
Truss Bridging,	2,500	18,00	45,000	
do. do.	1,100	12,00	13,200	
Pile Bridging,	1,000	7,00	7,000	65,200
<i>Track.</i>				
	Miles.			
Main Track,	95.5	\$7,500	716,250	
Side tracks and fixtures,	. . . . .	. . .	30,000	746,250
<i>Machinery.</i>				
	Number.			
Locomotive Engines,	10	\$7,500	75,000	
Passenger Cars,	12	\$2,200	26,400	
Baggage and Mails Cars,	6	\$900	5,400	
Box Freight Cars,	30	\$700	21,000	
Platform Cars,	50	\$500	25,000	
Earth Cars,	50	\$300	15,000	
Hand Cars,	20	\$75	1,500	
Snow Ploughs,	4	\$725	2,900	172,200
<i>Building.</i>				
Buildings & fixtures at Bangor,			30,000	
do. do. Calais,			20,000	
Intermediate Stations,			14,000	64,000
Land for Roadway and Stations,			40,000	40,000
Total cost,				\$2,666,577
Average cost per mile,			\$27,922	

OF OTHER ROUTES.

As stated in another part of this report, it was unknown at the commencement of the survey, at what point it would be practicable or advisable to reach the Boundary, so as to unite with lines that might be surveyed in New Brunswick. In the absence of any definite knowledge of the country, except such as could be gleaned from the State map, and in view of the course pursued by the surveys in New Brunswick, it was deemed advisable to adopt a route which for the present survey, should bear in the general direction of the southerly portion of the Scoodic Lakes. The character of the country, as indicated by the streams and lakes, seemed to hold out a greater prospect of success, and the northern position would enable us to go either side of the lower Scoodic lake to meet whichever route should be surveyed in New Brunswick.

The general features of the country approaching the Boundary, both in Maine and New Brunswick, indicated that there were a number of practicable routes, and that these in part, at least, would coincide as to position, and might appropriately receive the same general designation.

There are in Maine three general routes, and these will be designated the Northern, Middle and Southern routes.

The latter diverges from the Middle, as before mentioned, at Union river in township Number 39 and unites with it again on the St. Croix river in the town of Baring, the two having the same terminus at Calais.

The Northern route diverges from the Middle in township Number 42 and terminates at the Boundary near the mouth of Canouse river.

The Middle route is but a continuation of the main line, which has now been surveyed, and its principal characteristics given in the foregoing general description.

The line therefore, as surveyed from Bangor to Union river, a distance of 31 miles is common to all these routes, and from this point to West Machias river, a distance of 16 1-2 miles, it is common to the Middle and Northern route.

NORTHERN ROUTE.

No surveys have been made on this route, but our explorations in this direction enable me to state with much confidence, that a feasible route would be found diverging from the Middle route, at Fifth lake stream and passing to the north of the highlands in Number 42, thence crossing the narrows of Third lake, and the northern part of Number 43, it would reach Grand lake stream in the north west corner of Number 27. This stream may be crossed with a bridge of about 80 feet span, thence the line would pass along the north side of Lake Genesegarnagum, and following a direct course across townships 1, 2 and 3, reach the Boundary at the north east corner of Number 1.

The distance from Bangor to the eastern Boundary of the State, by this route is 88.5 miles.

Its position is indicated by the broken line on the map, as also two modifications of this route in townships 42 and 43. One of these passes round the head of Third lake, and unites with the former at the narrows. The other diverges from the line surveyed for the Middle route, near the summit in Number 43, and running northerly, intersects the former near Little river. Either modification would materially increase the distance.

The gradients, curvatures and cost of construction on this route would probably nearly correspond with the same items on the line surveyed.

SOUTHERN ROUTE.

Some measurements have been made and the greater part of this route explored.

There are however, two points involved in some doubt, which circumstances did not permit to be investigated with sufficient care to enable me to speak with entire confidence as to its practicability.

The most direct course to be pursued by a southern route would be to diverge from the line now surveyed, where it bears northerly up Union river in the township of Tilden.

Taking up the main line which, west of Union river has for several miles a direct easterly course, we would extend it for this route in the same general direction across this stream—the eastern portion of Tilden, and the whole of townships No. 34 and 35, till it would strike the west branch of West Machias river.

Soon after crossing Union river in Tilden, the line will follow up Alligator stream, a tributary of the former, to the west line of township No. 34, thence up a small branch of the latter to its source, where it crosses to Eagle lake, in township No. 34, which is one of the sources of Narraguagus river, and continuing along its northern shore and that of its outlet, reaches township No. 35, which it crosses nearly through its centre, and enters the valley of the west branch of West Machias river near the east line of this township.

In this latter township there is an elevated ridge extending nearly from its northern to its southern limit, and which constitutes one of the difficulties on this route, the extent of which is as yet undetermined.

Intelligent persons who are familiar with every part of this township, the whole of which is laid out into lots, state that there is a depression in this ridge about midway of the township, which is of so favorable a character as to place the practicability of crossing it with a feasible line beyond a question. A reference to the general

map will indicate the position of this depression which appears to be such as to permit a direct route to be followed to Machias river.

The other difficulty alluded to is in township No. 34, situated between the waters of Alligator stream and Eagle lake.

From all the information which could be obtained from persons who have traversed the township in various directions, a favorable opinion is formed of the character of the ground. It is described as a level country, presenting no obstacles whatever to the construction of a railway. In confirmation of this, it is stated there was a litigation not long since, in reference to some matter connected with this part of the township, and it was proved in evidence at that time, that a dam erected across the outlet of Eagle lake, flowed the water westerly into Union river. This would seem to indicate that there could not be much doubt of the feasibility of this portion of the route.

The position of the stream in the central portion of township Number 34, suggests a modification of the route through this township, should that by Eagle lake prove unfavorable.

This would follow up Alligator stream nearly to the lake of the same name, thence strike across to the west branch of the Narraguagus river, and unite with the Eagle lake route in the western part of township Number 35. This route is quite circuitous, and would therefore add materially to the distance.

The west branch of West Machias river, has its source in a number of small lakes known as the Sabio lakes. Our explorations on the southern route, extend from these lakes to the point where it would unite with the middle route at the north line of Baring on the St. Croix river, embracing a distance of over 40 miles.

The most northern of the above mentioned chain of lakes is in the southern part of township Number 41, and not far distant from the head waters of Freese Brook running northerly into Casabeus

stream, which is the inlet of Nicatous lake. As our line as now surveyed, occupies the valley of Freese brook for a considerable distance running southerly, a connection can very readily be made with the southern route by continuing the line on the same general course up to the source of this brook, and thence across to the upper Sabio lake.

In case the more direct route as described and laid down on the map, passing through township Number 34 should prove impracticable, this route diverging in township Number 40, would probably offer another opportunity by which the Machias river could be reached with a view of making a continuous southern route to the St. Croix.

The adoption of this modification of the southern route would probably give an increased distance of five miles over that of Eagle lake.

Having reached the first Sabio lake, which is a point common to both routes, we would follow down the west branch of west Machias river its whole extent, which is highly favorable. The fall of this stream is satisfactorily ascertained from the dams which have been erected across it to increase its depth for the purpose of "driving logs." The descent of this stream is quite uniform and the aggregate fall from Sabio lake to its junction with the main stream, a distance of over 8 miles will not probably exceed 70 or 75 feet, giving an average inclination of not more than 9 or 10 feet per mile.

The surface of the ground is very uniform along this stream, some portion of which in its natural state, is free from timber and annually produces grass which is cut and preserved for lumbering purposes.

Crossing the main Machias river, the route to be pursued passes southerly through township No. 31, touching Bowles brook, and crossing Old stream, thence bearing northerly it crosses the outlet of the Chain lakes, near the foot of the latter, and continuing nearly

the same general course, passing north of Wesley ridge, and striking into the valley of Bear brook, which it follows to a point near the north east corner of Wesley, where it enters the town of Crawford and the valley of East Machias river. From this point it bears more northerly, following up the valley of this stream to Poke-moonshine lake, thence along the south easterly shore of the latter to a gap in Crawford ridge, where it curves southerly, passing through this depression and reaches the head of a small brook running easterly, which it follows to Barrows lake in the south west corner of the town of Alexander, thence running northerly along the west shore of this lake to its head, where it curves easterly and crosses to the east side of Stevens lake which it follows to its outlet. This outlet which runs into Lake Meddybemps, is crossed near Stevens lake, thence bearing more northerly, the line would follow near to and pass the north end of the former lake, passing through Alexander and Baileyville to the St. Croix river at the south east corner of the latter town, where it would unite with the line surveyed for the Middle route. Thence these lines would occupy ground in common to Calais.

On the supposition that the portion of this route between Alligator stream and Sabio lake proves practicable, the distance or length of road to be built adopting the Southern route, will not probably differ materially from the distance on the Middle route.

The nature of the country is such however, for a large portion of the distance on this route, as to seem to warrant the conclusion that the chances for reducing the distance without an increase of the inclination of the gradients, are greater than on the Middle route,

If however it should be found necessary to adopt the modification of this route, making the diverging point in township No. 41, then the distance will be several miles longer than the Middle route.

From the best data now before me, I find that the distance from Bangor to the Eastern Boundary of the State, on the several routes is approximately as follows :

On the Northern Route, terminating near the mouth of Canouse river,	88.5 miles.
On the Middle route, terminating at Calais,	95.5 miles.
“ “ Southern “ “ “ “	95.3 miles.
“ “ “ diverging at township No. 41,	100.5 miles.

From the above it appears that the northern route is shorter by from 7 to 12 miles than the others, and that the middle and southern routes differ only about one fourth of a mile which is in favor of the latter, assuming that the Alligator river and Eagle lake portion is practicable. With the other modification the middle route is the shorter by 4 1-2 miles.

The greatest elevation passed over by these several routes will not differ materially, the middle route however, will exceed by a few feet, either of the others.

The aggregate rise and fall will be the least on the northern and probably the greatest on the middle route. The amount of curvature and the maximum gradient will also be greatest on the middle route, while the gradients of the other two will be nearly the same, yet the curvature on the southern will exceed that of the northern route.

Relative to the comparative cost, no very accurate opinion can be formed, yet there are grounds to suppose that the northern and middle routes will cost about the same average per mile.

The cost of the southern will probably average less per mile than either of the others. No reliable estimate can be made of the northern and southern routes, except by actual surveys.

The question of location in Maine, will be governed to some extent by the route which may be adopted in New Brunswick, and the topography of the country between the river St. John and the St. Croix indicates that there are two practicable routes, one through the interior, terminating either at the St. Croix at a point several miles above Grand Falls or at St. Stephens, the other route along

the coast also terminating at the latter place, which is opposite Calais.

Regarding the question of route in Maine, as connected with the local business of the country, it appears a matter of not much importance whether the middle or southern route should be adopted. It is maintained by the advocates of the southern route, that there would be a large business drawn to the road on that route from towns along the coast which would never reach the road provided it was located on the middle or northern route.

All the population of this State east of the towns of Cooper, Marion and Whiting, will reach the road at Calais or Baring, and therefore are not affected by the question of routes.

The population along the coast west of Cherryfield to the Penobscot, could reach railway communication at Bangor in about the same or less distance than at any other point. The improved state of the country and the superior roads in that direction will probably draw the travel to Bangor direct.

The diverging point of the Middle and Southern routes being 18 miles east of the Penobscot, or 31 from Bangor, the location of the routes will be a matter of no moment to this population.

The intermediate towns therefore, embrace all the inhabitants who may have an interest in the location of the road on the Southern route and who will in some degree contribute to its trade. These towns contain 15,000 inhabitants and the greater portion of this population is along the coast at a distance of from 15 to 25 miles from the line of the road on the Southern route.

During the lumbering season there is considerable intercourse between the coast and the interior, and this will be very much increased when a great thoroughfare shall have been extended through this district of country. The business between the coast and the interior, will doubtless continue to increase from year to year as the population and trade of the country increases and the travel going

either east or west, will mostly prefer railway conveyance to any other. Some descriptions of freight, such as light and valuable merchandise, will probably reach this population, on the road, particularly in the winter season. These are considerations which favor a Southern route, and should receive all proper attention when the question of location comes up for final settlement.

With reference to the local business of the Middle and Northern routes it is proper to state, that for a number of years it will principally consist of the transportation of lumber and other productions of the forest, and the intercourse growing out of this business. After the country is cleared up, manufactures and agricultural products will gradually take place of this description of freight, for which the abundance of water power and the character of the soil seem to be well adapted.

In view of the great extent of the Schoodic lakes, it appears of some consequence, that the road should touch these waters or approach sufficiently near to permit a branch to be extended to them at moderate expense. By such a connection, a greater extent of country will have access to the road, and a large amount of business will probably reach it, crossing these lakes, both summer and winter.

Whatever the value of such a connection may be, its benefits can be attained with a moderate expenditure, only by the adoption of the Northern and Middle route.

The extreme eastern towns of the State, contain the mass of the population, whose trade will be of much importance to the road, and so far as the accommodation of these inhabitants and the commanding of this trade is concerned, the question as to whether the Southern or Middle route is adopted, is an indifferent one. The nearest points, where the road may be reached by this population, will be at Calais and Baring.

The Northern route, having a different terminus at the Boundary would entirely avoid these towns, and its adoption would be attended with a serious loss of way business to the road.

From the preceding description of the several routes for the road in Maine it will be seen, that the eastern terminus at the Boundary, must be determined by the practicability of approaching the same point on the New Brunswick side.

The lines which diverge in Maine, do not intersect till they reach the St. John river in New Brunswick, and therefore to arrive at just conclusions as to the relative merits of different routes, reference must be had to the surveys which have been made for corresponding routes in New Brunswick.

For valuable information relative to the character of the country, and the feasibility of the routes, and other interesting facts connected with this enterprise in New Brunswick, I am indebted to J. Wilkinson, Esq., by whom these surveys were made.

From the data furnished me by that gentleman, as the results of the examinations in New Brunswick, together with the surveys in Maine, I am enabled to present a general comparison of routes.

Taking the Southern or Middle route in Maine, in connection with the Coast route in New Brunswick, and the Northern route in Maine in connection with the interior route in New Brunswick, we have two entire routes from Union river to the river St. John, and these may be properly designated the Grand Northern and Southern routes.

There is also a connection of these routes in New Brunswick, by which the Northern and Southern routes in that Province may both terminate at St. Stephens, opposite Calais, permitting the Southern and Middle routes in Maine, to connect with either of these routes in New Brunswick.

The Northern route in Maine may be connected with the Southern in New Brunswick, but neither combination appears desirable.

The following statement exhibits the length of line in Maine and in New Brunswick on each route, and the total length of each.

Northern route in Maine,	88.5 miles.
Southern route in New Brunswick,	85 "
	<hr/>
Total distance,	173.5 miles.

This combination gives nearly equal length of road to be built by Maine and New Brunswick, between Bangor and St. John, and reduces the distance as obtained by uniting the Southern route in Maine with the Northern in New Brunswick, 21 miles. It reduces the distances as given on the Grand Northern route, 10 miles, and exceeds the distance on the Grand Southern route by 5 miles.

The grades and cost of construction approaching the boundary in New Brunswick on this route, which follows the valleys of the Dig-deguash and Canouse rivers, would probably be less than by the main Southern route.

The same superiority in this respect would characterise this route, approaching the Boundary in Maine. No very satisfactory conclusion however can be arrived at without elaborate surveys of the whole country between the Penobscot and the St. John rivers.

The difficulty fortunately does not consist in obtaining a practicable route, but rather in the proper selection of the most feasible one from the many presented for consideration.

From the information collected by the hasty surveys and examinations of the past season, it appears that the Grand Southern route is the shortest and secures, generally, favorable gradients and reasonable cost—that it passes through a more cultivated section of country, touching important towns on navigable waters, and accommodates the greatest number of inhabitants—that, while it secures and facilitates the local trade of the country to a greater extent probably than any other route, it accomplishes the far more important desideratum—that of being the shortest feasible route for the through business of this great enterprise.

The facilities of communication along this route, both by the superior roads of the country and by water, will very much reduce

the cost of construction and expedite the execution of the work.

On the Northern route in New Brunswick these particular advantages will not prevail to the same extent, yet it passes for a larger portion of its distance, in the vicinity of settlements and public roads, and approaches sufficiently near the City of Fredericton, the seat of Government of New Brunswick, to permit a branch to reach it by a favorable route, in a distance of 22 miles from the main line. This with reference to the local trade of the road, is of great importance, inasmuch as it will open a communication with the valley of the St. John and draw more directly to the support of the road, the trade and travel of some 30,000 inhabitants, and a large extent of fertile country.

This route would pass through the coal measures of this part of New Brunswick; and the opening of such a communication would doubtless develop the mineral resources of the region traversed, and render them subservient to the trade of the road. Its adoption however, would subject the through business and a large portion of the way business, to inconvenience and a perpetual tax, resulting from the increased distance and the greater elevation to be overcome.

The general results of the surveys show :—

1st. That a highly feasible route can be obtained between the city of Bangor and the city of St. John, upon which the distance will not exceed 168.5 miles, with a strong probability of its being reduced on a final location to 160 or 165 miles.

2d. That the greatest elevation above tide, to be crossed, will not probably exceed 350 feet, which is within the limits of Maine, and that the maximum grade will not exceed 50 feet per mile, and may probably be reduced to 40 or 45 feet per mile.

3d. That there will be very little if any abrupt curvature, no points requiring excessive expenditure, and the cost per mile will fall below that of the average of New England roads.

I have now given the results of the surveys in Maine for this enterprise, and some of the leading features of those in New Brunswick so far, as they are necessarily connected with a description of the several routes in Maine.

In reporting on a work of this magnitude,—a work which is one of the great enterprises of the age—extending, as it does, through the territory of three different Governments, the success of each portion depending much on the favorable features of the other portions—I say, in reporting on such a work, it appears highly important, that the characteristics of the line as a whole in an engineering view, not only in Maine, but in New Brunswick and Nova Scotia also, should be presented.

It is also equally important in considering the question of traffic, that we take the same comprehensive view, embracing the local trade and resources of the various towns, cities and districts, through which it is to pass, as well as the general resources of the different States, by whom it is to be built, and the great object, which as a whole it is designed to accomplish.

I will therefore proceed to submit some observations on the topography and engineering features of the route in New Brunswick and Nova Scotia, as determined by careful surveys for nearly the whole distance, made under the direction of competent and scientific engineers.

It may be proper for me to state, that at the request of the Executive Committee in New Brunswick and Nova Scotia, I have passed over the whole route, with a view to inspect personally the feasibility and capabilities of the country, having the reports of Engineers, with plans, sections, &c. of the surveys before me for reference.

The country west of the river St. John, following the coast route, is of a somewhat different character from that along the route east of this river.

The principal streams have a course transverse to that of the road; and although this is usually considered an unfavorable feature, yet in this case no serious obstacles are interposed, and the country is much more favorable, than on a cursory examination it would at first seem to be. Many of the rivers, which empty into the Bay of Fundy along the southern coast of New Brunswick, possess a peculiar feature. As they approach near tide water, they have a rapid descent, some of them pitching from various elevations, almost directly into the bay.

This feature is also noticed in many of the streams in Maine, and the coast appears to have been, at some former period, suddenly elevated.

The marine shells found many feet above tide in clay and marl beds, and the regular terraces of gravel or alluvium observed on the borders of many of the rivers are clear indications of important changes in the elevation of the coast.

The principal rivers emptying into the ocean on the southern coast of New Brunswick, which are crossed by the line of the road, are the St. Croix, Digdequash, Magaguadavic and St. John.

The St. Croix reaches tide water by several rapids in close succession, and empties into Passamaquoddy Bay at St. Andrews, where it is nearly three miles in width. The point, at which it is crossed by the line, will require a bridge about 400 feet in length.

The Digdequash, although a small stream, penetrates into the interior for a considerable distance, and its valley is followed several miles by the Quebec and St. Andrews railroad.

The Magaguadavic river has its source in Lakes in the interior near the St. John river. Near its mouth it descends by several falls in succession, having an aggregate descent through a narrow gorge in the rocks, of about 100 feet. A large amount of timber comes down this stream annually, and is manufactured into lumber by mills erected at this place. It can be crossed by the railway without encountering more than ordinary difficulty and expense.

The St. John is the largest river in New Brunswick, and above the Falls it is navigable for sail vessels and steam boats to Fredericton, a distance of 80 miles.

It is navigable for small steam boats to Woodstock, and by some improvements, and a canal around the Grand Falls, the navigation may be extended to the St. Francis river, a distance of over 275 miles from the Ocean. The upper portions of the river receive numerous large tributaries, many of which are or may be rendered navigable.

Descending the valley from Fredericton, the river increases to a width of three miles in some places, and is connected in a most remarkable manner with lakes, deep inlets and bays, which add nearly 100 miles of uninterrupted lateral navigation to the river.

As the river approaches the ocean its channel becomes more contracted, and its banks are precipitous and rocky. At the Falls near the City of St. John, it rushes through a narrow gorge, the width of water way at the narrowest point probably not exceeding 400 feet, and pitches into the harbor of St. John, by a fall of 24 feet at low tide.

The tide sets up this river 80 or 90 miles, and the falls disappear at a certain state of tide; but in consequence of the too narrow passage to admit freely the waters of the sea at flood tide, a fall of several feet is soon created from the bay inward, so that at this remarkable place, there is alternately a fall of several feet in each direction on each ebb and flow.

For the river navigation there is a fine harbor above the falls, in the suburbs of St. John, vessels passing from the main harbor below the falls, up the river, are necessarily restricted to a short time at each flood and ebb tide, when the waters of the river and the ocean are nearly at the same level.

The St. John may be regarded, in many respects, as one of the most remarkable rivers of the continent. It rises on the northwest-

ern border of the State of Maine, and passing round the whole northern portion of the State, forming the Boundary between the British Provinces and the United States for 60 or 70 miles, thence descending by a perpendicular fall of 58 feet, and total descent of over 100 feet in a distance of about one mile it passes into New Brunswick, running southerly along its western frontier some 70 miles, thence bearing easterly it crosses the south western point of the Province and empties into the Bay of Fundy.

Having traversed a distance of over 400 miles through a country abounding with large rivers and lakes and numerous deep and navigable inlets—collecting the drainage of a country whose area cannot be less than 12,000 square miles, and conveying its accumulated waters through a broad and deep channel to the very shore of the ocean, the river is at length forced through a narrow chasm of a few hundred feet in width and precipitated into the sea.

The latter feature is a remarkable one and must always present great attractions to the tourist; yet the facilities it affords to the great enterprise now under consideration, for crossing this large river, render it a point of far greater interest. It is a most extraordinary and unusual circumstance to be able to cross a river of the magnitude of the St. John where it empties into the ocean—a river that is half a mile in width one hundred miles from the sea, and before its *débouchement* attains a width of over three miles and yet can be crossed at comparatively moderate expense with a bridge not exceeding 600 feet in length, neither requiring a draw, nor interrupting navigation.

This site for a bridge is every way favorable for reaching the city of St. John, which is on the east side of the river, in full view, as well as for the continuation of the road eastwardly from this point.

From the city of St. John to Shediac on the Gulf of St. Lawrence, an accurate survey has been made for a railway, by J. Wilkinson, Esq. from whose valuable report I obtained the facts relative

to this part of the route in New Brunswick. The route followed by this survey coincides with that proposed for the European and North American Railway, from the St. John to the bend of the Petitcodiac, a distance of 91 miles.

Leaving the city of St. John, the line surveyed passes over unusually favorable ground, to a point near Lawler's lake, a distance of four miles, where a lime-stone ridge of considerable extent is encountered. This, however, is overcome with a gradient of 22 feet per mile, for a distance of 2 1-3 miles, ascending easterly and descending on the opposite side with an inclination of 20 feet per mile for about two miles.

These gradients are obtained without an extravagant expenditure. From this point, the line descends to the shore of the Kennebecasis bay, near which it follows for several miles, and thence crossing Hammond river, it reaches by a direct course Darling's lake. The line follows the shore of this lake with easy grades and curvatures to Groom's cove, thence passing Acieack marsh and Hampton ferry, it arrives at the Toll bridge, crossing the Kennebecasis river, in a distance of 28 miles from the city of St. John.

For a considerable portion of this distance, the cost of construction will be greater than the average of other portions of the route, resulting from the larger amount of rock excavation and bridging. The average cost of grading however, according to the report above referred to, is only a trifle over \$9,030 per mile,

From the Toll bridge to Sussex vale, the line follows the valley of the Kennebecasis the whole distance, which is 17 3-4 miles or 45 3-4 miles from St. John. The maximum gradient on this portion of the route, is a trifle over 7 feet per mile, and the average rise of the valley to this point is about three feet per mile. The elevation attained is but 61 feet above high water spring tides at St. John. After passing Sussexvale, the line follows up Salmon river one of the principal branches of the Kennebecasis, to Stones brook,

with a uniform rise of 7 feet per mile, thence up the latter stream to the summit, which is 56 miles from St. John, and elevated only 150 feet above tide. This summit is overcome by a maximum gradient of 22 feet per mile going in either direction, that on the westerly side being about 3 miles in length, and that on the easterly side 1 1-2 miles.

From the summit, the line strikes into the valley of the Annagance, which it follows to the Petitcodiac, thence it passes down the valley of the latter stream to the Bend, which is about 35 miles from the summit, and 91 miles from St. John.

The gradients, descending easterly from the summit to the Bend, a distance of 35 miles, are of the most favorable character. After passing the short gradient of 22 feet per mile, before mentioned, there are no others exceeding 7 feet per mile, and 14.5 miles of this distance is level. The average rise from the city of St. John to Lawler's Lake is 10 feet per mile, and the average descent to the Toll Bridge across the Kennebecasis is 2 feet per mile; thence the average ascent to the main summit is about 5 feet per mile, and the average descent from that point to the Bend of the Petitcodiac, is a trifle over 4 feet per mile. The aggregate rise is nearly the same in both directions, it being about 220 feet.

The following is a synopsis of the gradients of the whole line:—

Level Road,	38.75 miles.
Length of gradient from a level to 5 feet per mile,	18.52 "
" " " " 5 feet " 10 " " "	23.72 "
" " " " 10 " " 15 " " "	1.32 "
" " " " 15 " " 20 " " "	1.92 "
" " " of 22 feet per mile,	6.77 "

It appears from the above statement that for about 90 per cent. of the whole distance, the gradients do not exceed 10 feet per mile, and over 42 per cent. of the whole road between St. John and the Bend of the Petitcodiac is level. Of the whole line, 28 1-2 per cent.

is curved, but the radius of curvature generally ranges from 3000 to 5000 feet, much of which is nearly equivalent to a straight line.

The average cost of grading and bridging the whole line as per detailed estimate of Mr. Wilkinson is \$6,986 per mile. Or the average cost of the whole road, including fencing, buildings, and machinery complete, according to his estimate, is only \$16,290 per mile. This is a low sum compared with the cost of New England roads generally, but the country indicates that an unusually cheap road may be built. The whole route may be considered as in a high degree favorable for a railway; and I know of no route in New England, of equal extent, which combines in an equal degree all the elements which constitute a most superior and cheap road.

It may be proper for me to add that the survey and estimates of this route were made for a road having a different object in view from the present, and therefore the plan of construction contemplated by that estimate, would not perhaps be strictly the best for the present enterprise.

No changes would necessarily be required in the dimensions and character of the road bed or mechanical structures immediately connected with it. It would, however, be desirable to substitute the edge rail of an approved form, in place of the plate rail formerly contemplated. There may be some changes in the character and extent of the Station buildings, the machinery, &c., &c., to adapt them to the purposes of the proposed railway.

Adding liberally to the cost for these items, this portion of the contemplated railway will fall far below the average cost of similar works in the United States.

This survey, as before stated, was extended to Shediac, and with generally the same favorable results which characterise other portions of the route. The eastern portion of it however, is not on the most direct route to Halifax, the probable diverging point being at or near the bend of the Petitcodiac. This is however, a question

of some uncertainty. Whatever route should finally be adopted for the road in the direction of Halifax, there would most unquestionably be a connection with Shediac Harbor, a point of much importance.

From the Bend of the Petitcodiac to the Boundary line between New Brunswick and Nova Scotia, at or in the vicinity of Bay Verte, following the direct route, there has not, to my knowledge, any line been surveyed. Of the feasibility of a nearly direct route between these points, there can be scarcely any doubt.

In crossing the country from the bend of the Petitcodiac to Shediac, the greatest elevation passed over by the survey of Mr. Wilkinson was 143 1-2 feet and the distance was 16 3-4 miles. The country generally in New Brunswick, between the head of the Bay of Fundy and the Northumberland strait, is not of a broken character, and nowhere does it attain a great elevation. By Major Robinson's survey, the distance from Shediac to Bay Verte is 26 miles making the measured distance between the latter and the Bend, by way of the former place, 42 3-4 miles.

The distance by the most direct route will probably be between 30 and 35 miles.

It is believed that it will be entirely safe if we assume the latter as the distance.

With this we are enabled to make up the length of that portion of the European and North American Railway, within the limits of New Brunswick.

From the Boundary line of the United States at Calais to the City of St. John	73 miles.
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From the City of St. John to the Boundary line of Nova Scotia, near Bay Verte,	126 miles.
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Total,	<u>199 miles.</u>
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The length of road to be built in New Brunswick will not probably, at most, exceed 200 miles, and there are strong grounds to believe that it may be reduced to 195 miles.

OF THE ROUTE IN NOVA SCOTIA.

Extensive surveys and explorations have been made in Nova Scotia for the Quebec and Halifax railway, under the direction of Major Robinson, of the Royal Engineers, all of which are directly available for the European and North American Railway.

From the able report of that officer, it appears that there were two principal routes examined; one terminating at White Haven, near Canso, and the other at Halifax. The leading features of these routes, and the arguments for and against each, appear to be fully presented.

The greater length, the increased difficulties of construction, and the sparse population of the White Haven route, on the one hand, and on the other, the great commercial advantages of Halifax, its superior harbor, and the necessity of building a long branch to that point, should the trunk line be carried to White Haven, were the principal reasons assigned for recommending Halifax as the Atlantic terminus of this great line of railway.

Not having examined any other route than that terminating at Halifax, I am unable to offer opinions formed from personal knowledge, relative to other routes, or to discuss their relative merits.

The same arguments in favor of or against either of these routes, as connected with the Quebec and Halifax line, are in a great degree applicable to the project now under consideration, for whatever route should be adopted in Nova Scotia for the former, may, and should be identical with that of the latter.

The present position of railway enterprises in Nova Scotia, and the features of the country developed by the surveys above referred to, seem to indicate that the terminus recommended for the Quebec and Halifax railway, is one which more generally appears to meet the requirements of the present proposed work than any other, and therefore, on this occasion, I shall confine my observations to that route.

The head of the Bay of Fundy is separated from Northumberland straits on the Gulf of St. Lawrence, by a narrow belt of country which lies partly in the County of Westmoreland, New Brunswick, and partly in Cumberland and Colchester Counties, Nova Scotia.

The upper extremity of this bay is divided into two arms, which penetrate several miles into this narrow belt or isthmus, and give it an irregular outline. The northerly arm is known as Chignecto Bay, which also separates itself into two parts, one of which is Shepody Bay and Peticodiac river and the other Cumberland Basin, each of which approach within about 16 miles of Northumberland Straits.

The southern arm is a large body of water, the upper part of which is called Cobequid Bay, and the wider and more westerly portion of it is known as the Basin of Mines. Between these arms of the Bay of Fundy, and running nearly parallel with the latter, are the Cobequid Hills which extend easterly from Cape Chignecto, nearly across the Isthmus.

This range of highlands forms the principal obstacle to the location of a line of railway in the direction of Halifax. They have a general width of about 10 miles, and are elevated from 600 to 1200 feet above the sea. Portions of this ridge have a good soil and are covered with a valuable growth of hard wood. The base of these hills is of the red sand stone formation, but the more elevated portions are granite and porphyry.

From the Boundary line of Nova Scotia, at or near Bay Verte, to the valley of Little river, the country is favorable. The line will have a direct course, and it is believed that no gradients of greater inclination than 15 or 20 feet per mile will be required—thence it will follow down this stream by a gentle grade to its entrance into the river Philip, a distance of five miles—thence pass up the valley of the last mentioned river, which it follows for four miles, with a

grade not exceeding 20 feet per mile to the mouth of Tulloap's creek, which it ascends with easy grades for seven miles.

The line as surveyed, here approaches the Cobequid range, and the country is of a less favorable character. It ascends to the valley of Little Wallace river with a grade of 35 feet per mile, which it crosses, and passing through some broken grounds, reaches another tributary of Wallace river which it descends with the same inclination for 2 1-2 miles, where it passes round a point of highlands and enters the valley of the main stream. It is from this point that the rapid ascent of the Cobequid range is commenced, the distance to the summit at Folly Lake, being between four and five miles.

The elevation of this lake is 600 feet above the sea, and its outlet runs southerly into Cobequid bay. It is through the valley of this stream and that of Wallace river which has its source near this lake and runs northerly into the Straits of Northumberland, that the line approaches the summit in either direction.

The maximum grade ascending the southerly side of this ridge, as determined by the surveys before alluded to, is 57 feet per mile for 6 1-2 miles, and on the northerly side 66 feet per mile for 4 1-4 miles.

It may be proper for me here to observe that these are gradients reported probably after a hasty preliminary survey, and it is not improbable that improvements may be made by which they would be reduced. The survey of the Quebec and Halifax railway was an extended and difficult one, its object was to determine the practicability and general features of the enterprise, and this was demonstrated in the most satisfactory manner by the able and accomplished officers under whose direction it was made. But it was impracticable and unnecessary at that stage of the investigation, to examine the country with that precision and detail required for a definite location of a great work, and therefore it is probable that the maximum gradient on each side of this ridge, may by a more

elaborate survey, be reduced. I am quite confident that on the northern side it can be reduced to 60 feet per mile, and on the southern side to 50 or 55 feet per mile, without an unreasonable development of the line, or expenditure of construction.

From the summit, the line descends the valley of Folly river for a few miles, thence it bears easterly and descends along the southerly slope of the ridge in the direction of Truro, to the head of the Cobequid Bay, which it crosses by a bridge of 500 feet in length and reaches the valley of Truro mill stream, near the village of Truro.

From the south end of the gradient at the base of the Cobequid Hills to this point, a distance of 11 miles, the country is generally favorable, no grades exceeding 40 feet per mile will be required. The soil of the shores of the Cobequid Bay and the country about Truro, is red sand stone.

Leaving this place, the line follows up Truro mill stream with a grade of 17 feet per mile for several miles, thence leaving the valley of this stream, it crosses the slightly elevated grounds, dividing it from the Stewiacke river and skirts along the northern side of this stream with a gradual descent to its mouth, where it crosses and enters the valley of the Shubenacadie river, which it follows to the lake of the same name, a distance of 19 miles. The general direction of the line is good, and the grades and curvature are easy. At this point the line reaches a range of highlands which extends along the whole Atlantic coast, from Cape Sable to Canso.

This range has an average height of about 500 feet above the sea, and is from 20 to 50 miles in width. The lowest depression is found extending from Halifax harbor, in the direction of Truro, and is occupied by a chain of lakes, the highest of which is only 90 feet above the sea.

Lake Charles, which is but about three miles from Halifax harbor, is the summit from which the waters flow through a number of other lakes to the Grand Shubenacadie Lake, the outlet of which

forms the Shubenacadie river, emptying into the Bay of Fundy.

The line follows along the shores of these lakes for the whole distance to Halifax harbor, and although some considerable rock cutting is encountered, yet the ground generally may be regarded as favorable, permitting moderate grades and curvature.

From Fletcher Lake, there are two lines surveyed, one terminating at Halifax, and the other at Dartmouth, on the easterly side of the harbor. Both these lines are feasible, and each presents its particular claims for consideration. It is however, unnecessary at the present time to discuss the relative merits of these lines, and we shall, therefore, only add a brief statement of the distances and the gradients of the whole route in Nova Scotia, as reported by Major Robinson.

The total length of line in Nova Scotia is 124 miles, of which distance the road for

66	miles	will be level, or of grades not exceeding 20 feet per mile.
44	" "	have grades of from 20 to 40 " " "
10	" " " "	57 " " "
4	" " " "	66 " " "

From the above, it will be observed that for one half of the whole distance in Nova Scotia, the road will be either level or have inclinations under 20 feet per mile, and nearly 85 per cent of the whole distance is less than 40 feet per mile.

Relative to the cost of the road in Nova Scotia, I will observe, that the cost of the Quebec and Halifax railway, was estimated by Major Robinson at £7,000 sterling or about \$34,000 per mile. This was intended as the average cost of the whole line from Halifax to Quebec, a distance of 635 miles. It is possible that the portion of the line in Nova Scotia would fall below this average, on account of the work being more accessible and the greater advantages of procuring laborers and supplies, than in the more secluded districts through which other portions of the road would pass.

The following summary shows the length of road to be built in the State of Maine, in New Brunswick and in Nova Scotia.

Maine, (omit inclinations)	96 miles.
New Brunswick	200 "
Nova Scotia	124 "
Giving	<u>420 miles.</u>

as the total length of the European and North American Railway.

From the surveys made of the various portions, I can state with much confidence that, of the 420 miles of railway, there will be over 350 miles upon which the grades will not exceed 30 feet per mile, and for over 100 miles of this latter distance, the road will be level. The maximum grade, with the exception of one point, will probably not exceed 50 feet per mile, with comparatively a short distance of this inclination.

The portion of the line where the grades exceed this; is confined to a distance of about 12 miles, in crossing the Cobequid Hills in Nova Scotia. These inclinations probably will not rise higher than from 50 to 60 feet per mile, and of the latter gradient there need not be more than five or six miles.

The greatest elevation passed over in the 420 miles is also at the Cobequid Hills, which is 600 feet; the greatest in New Brunswick probably will not exceed 250 feet, and that in Maine 300 feet above the

It is a fact worthy of notice, that this great work throughout its whole extent of over 400 miles, traversing a country, the most prominent characteristics of which are its numerous large rivers, lakes and inlets, that at no point is it interrupted by ferries, nor are the difficulties encountered or expenditures required in the construction of bridges and other works at all corresponding with the magnitude of the rivers to be crossed, and the objects to be attained.

This peculiarity, together with the great extent of line which may be constructed at a low rate, will tend to reduce the average

cost of the whole work to a sum considerable below most of the great lines of the United States.

From the examination I have been able to make, together with information obtained from the reports of the Engineers who have surveyed various parts of the line, I am of opinion, that with judicious management, the whole work may be constructed with a single track and equipment at a cost not exceeding \$30,000 per mile, or a total cost of Twelve millions six hundred thousand dollars.

PROSPECTIVE BUSINESS OF THE ROAD.

Having given the general characteristics of the whole work, the next question to be investigated is the probable return which may be anticipated from so large an expenditure. This is an important branch of inquiry, and must necessarily be presented somewhat in detail.

The local business of that part of the road which is in the State of Maine, will be made up by portions of the population of Penobscot, Hancock, Washington and Waldo Counties, and of Charlotte Co. New Brunswick, amounting to about 150,000 inhabitants.

The western terminus of the road is at the City of Bangor, which contains nearly 15,000 inhabitants. This is an important point, it being at the head of navigation on the Penobscot river, and containing a wealthy and enterprising population.

The number of arrivals at this port, during the last year, were 3567, and of clearances 3574. The assessed valuation of real and personal estate is \$5,121,805. The value of exports for the past year will probably amount to between Three and Four millions of dollars. There were 20 vessels built in the Penobscot district in 1850, having an aggregate tonnage of 3188 tons.

The Penobscot river possesses the peculiarity before alluded to, which characterises the St. John and other rivers along this coast,

having a descent of 92 feet in a distance of 12 miles, and terminating at the City of Bangor. Above these rapids the river is navigable for small steamboats and other craft a distance of 40 miles.

An immense amount of lumber in logs is annually sent down this stream from the interior. This fall in the Penobscot, so near tide water, renders the water power of great value, and adds vastly to the business and growth of Bangor. It is now improved to a great extent, and nearly all the lumber from the Penobscot waters is manufactured at mills erected on this portion of the river.

Extensive saw mills and other machinery have been erected at North Bangor, Basin Mills, Orono, East and West Great Works, Oldtown and Milford. There is an aggregate of 15 gangs and 154 single saws, equal to about 200 single saws, in operation at these mills. There are also 41 Lath, 9 Shingle and 10 Clapboard machines, 5 cooper, 3 machine, and several furniture, carriage makers and smith shops, besides other manufactories.

This machinery is capable of manufacturing 176 millions of feet of lumber, 50 millions of laths, 14 millions of clapboards, 17 millions of shingles, 1 1-2 millions of staves, 800,000 pickets, 60,000 oars and 30,000 barrels.

The amount of these articles, annually manufactured, does not every year reach the full capacity of the machinery, the quantity being regulated by the number of logs which come down the river, and the state of the market.

The largest amount of lumber surveyed in any one year, was 213 millions, and this of course included lumber manufactured at other points on the river above and possibly some that may have been manufactured the year before. The total amount surveyed in the year 1850, was nearly 203 millions. This is exclusive of what is technically called short lumber, such as pickets, laths, clapboards, shingles, &c. &c.

The lumbering business, on the Penobscot waters, has been increasing from year to year, and a reference to the amount of lumber surveyed for a series of years, does not show those great and frequent fluctuations which are generally supposed to attend this branch of industry.

For the amount of exports of lumber of every description for 1850, and the amount surveyed each year, from 1832 to 1850 inclusive, I refer to the appendix of this report, Notes A and B.

The lumber surveyed the last year, at an average price of \$12 per thousand, amounts to \$2,436,000, and it is probable that the value of all the lumber and other products of the forest manufactured on the Penobscot for several years past, would amount to not less than two and a half millions of dollars annually.

This lumber is mostly manufactured within 12 miles of the city of Bangor, and immediately on the line of the proposed road, and forwarded to market in rafts on the river.

This mode of transportation is found to be expensive from the losses sustained by the lumber being split, worn or destroyed in rafting and deterioration by being put into the water and soiled. These losses are estimated by intelligent dealers, at from fifty cents to one dollar per thousand feet, which, when added to the expense of forming the rafts and running them, increases the actual cost of transportation to such a rate per thousand as to leave no doubt that all the better qualities of lumber could be transported on the railway at a great saving to the forwarders or dealers.

Branches extended to all the mills, none of which need much exceed one fourth of a mile in length, and some much less, would permit lumber to be transported directly from the mills to market in the cheapest and most expeditious manner, and delivered in the best condition. During the best season of rafting, the amount of lumber forwarded in each raft, varies from 20,000 to 30,000 feet—but often during a portion of the year, only half this amount can be run

in each raft, in consequence of the low stage of the water. Consequently damage to the lumber, in such cases, and detention in arriving at market, are very much increased. With a railway properly equipped, 200,000 to 250,000 feet may be taken to market in each train, and one million daily, or as much as can be loaded and unloaded in that time. By this means the supply can be regulated by the demand, and the lumber retained at the mills, where the expense of piling room is less than in the city, until required for shipping.

Large quantities of small lumber are annually forwarded to market in rafts. Much of this is lost or disposed of at great inconvenience and expense, on account of its frequently having a different destination from that of the larger lumber in the rafts, upon which it is forwarded. This description of lumber, therefore, would mostly be forwarded to market by railway conveyance in preference to any other.

Having, on a previous occasion, examined with much care and attention, the subject of transportation of lumber from these mills to market by railway, I can with much confidence advance the opinion that with proper arrangements, all the better qualities of lumber, amounting to 60 or 70 millions of feet annually, as well as the greater portion of the short lumber, will take this conveyance. The latter, although less in quantity, will probably produce nearly as much revenue as the former.

The lumber manufactured at these mills, is from timber which is principally cut near the upper waters of the Penobscot. There is a larger amount of timber in the country through which the line of the road passes, which does not possess the same facilities of reaching market as that on the Penobscot. A portion of it now reaches that stream through the Passadumkeag, and other portions reach a market through the St. Croix and other smaller streams. The logs often have to be hauled a great distance, and are run with much

labor and expense through small and circuitous streams, and in passing rapids and falls receive more or less injury.

With a superior line of railway running through the heart of this district, touching the lakes and streams of the interior at numerous points, it is believed it will effect an almost entire revolution in the lumbering business.

It will probably be found preferable to manufacture the lumber near where the timber is cut, and forward it to market by railway conveyance. Mills being erected on and near the line of the railway, for which there is an almost endless amount of water power, the timber of more remote districts will readily be conveyed to them, and when manufactured into lumber, transported safely to market by this more expeditious communication.

Inferior qualities of lumber, which scarcely find sale and is of little or no value at the points where produced, or is so remote from cheap conveyance as to effectually prevent its removal, may be forwarded to market by railway conveyance, at such rates as will ensure a ready sale for large quantities at reasonable profits.

This is not a matter of conjecture, but is practically demonstrated by the experience of numerous railways in the United States. Lumber has been transported on one line 200 miles, and this in competition with canal navigation. Ship timber, masts, spars, curled maple and birch for ornamental work, fence posts, railway sleepers, and even fire wood, are transported long distances on railways to market, and command a ready sale at high prices, which without this means of communication, would be left to decay in the forests or be burned as a useless incumbrance of the soil. Great numbers of railway sleepers are annually shipped from Maine to Southern ports, and the demand for this article must continue to increase from year to year, and will add an important item of freight.

The extent to which ship building is carried on in Maine, creates a great demand for ship timber, which finds its way to the coast in

large quantities on the several railways now in operation, and by the ordinary conveyances of the country. The opening of a railway communication between the St. Croix and the Penobscot, will give facilities for the transportation of this article in each direction, to tide water and it will doubtless be a source of considerable revenue to the road.

The introduction of cheap conveyance into this district, will be followed by the manufacture of an endless variety of articles from the growth of the forest, which in turn will be succeeded by agricultural products as the country is improved. Cord wood is transported in vessels from N. Brunswick and Nova Scotia to Boston, and there is no reason why it may not reach Calais and Bangor by railway conveyance, and thence be shipped to other markets if necessary.

Large quantities of provisions and forage are annually forwarded to the lumbering districts. It is estimated by intelligent men, that there is annually sent from Bangor to the lumbering districts 50,000 barrels of Flour, 250,000 bushels of Corn and 6,000 barrels of Pork, together with a great variety of other articles.

These supplies are also forwarded in large quantities from Calais and other towns for the same purpose.

The intercourse created by the lumbering business, and the amount of travel from Bangor up the Penobscot valley is almost incredible. Numerous lines of daily stages, and some running twice a day, are fully occupied for a large portion of the year, and in addition, the number passing in private conveyances is equal to or greater than that by the stages. On the western portion of this line there are, including the population of Bangor, 25,000 inhabitants, to which add the population above Milford, which will pass over a portion of the road, giving a total of 50,000 inhabitants, who from the nature of their pursuits, will add to the passenger business in a greater proportion than is usual for a like population under ordinary circumstances.

The way business of the road in the interior, will at first, be confined to the intercourse created by lumbering operations, which at present, from the manner in which the business is transacted, does not appear to be of much importance. This however will be very much increased by the opening of a railway.

As we approach the St. Croix, the country is cultivated and contains an active and enterprising population.

Baring is a considerable village on the St. Croix, six miles above Calais, where there are 8 saw mills, 7 lath and 2 shingle machines. It also contains 8 stores, and is a place of some importance.

Calais is a flourishing town, containing nearly 5000 inhabitants. The town and parish of St. Stephens, on the opposite side of the river, contain nearly the same population; and although on different sides of the Boundary, the two places are intimately connected in their business relations. Such being the case, and being at the head of navigation on the St. Croix, possessing also a valuable water power and other advantages, this centre of business constitutes an important point.

Calais contains 85 stores, 1 bank, 16 saw mills operating 32 saws, 2 planing, 1 box and 21 lath machines, 5 machinery shops, 12 smith shops, 2 foundries, 1 tannery, 3 grist mills, 7 shingle mills, 1 stave and 1 plaster mill.

There were 6 vessels built in Calais during the past year, having an admeasurement of 1814 tons, and the number of vessels owned, not including any under 50 tons, is 32, with a total of 5766 tons. There were in 1850, 760 arrivals and 776 clearances. The assessed valuation of property is \$809,140, which probably does not exceed 50 per cent of its real value.

St. Stephens contains 69 stores, 1 bank, 23 saw mills with 65 saws, 2 shingle, 4 last, 2 planing and 21 lath machines, 1 foundry, 1 machine shop, and 3 grist mills. The assessed valuation of real and personal estate is \$1,469,400. The principal exports of Calais

and St. Stephens in 1850, were 76 millions feet of lumber of various qualities, 85 millions laths, 25 millions shingles, 4,075,000 pickets and clapboards, 7,000 shooks and one million staves, hoops and heads, also 13,000 barrels calcined plaster, and 1500 tons ground plaster. There were 800 vessels employed, having an admeasurement of 120,000 tons.

Full accounts of the imports have not been obtained, but with the active trade of these places, there must necessarily be large importations of merchandise.

For the supply of the surrounding country, and the lumber districts, there were imported into Calais, in 1850, 90,000 bushels of corn, 28,000 barrels flour, and 3,500 barrels of Pork.

The St. Croix river has here an aggregate fall of 72 feet, and between Milltown and Baring, an additional fall of 14 feet. This power is now occupied principally in the manufacture of lumber, but as the timber of the country gradually disappears, it will be applied to other manufactures. There are other considerable towns in the vicinity of this portion of the road, which will contribute largely to its local business. The population of these towns, together with those in New Brunswick, which will add to the business of the road more or less, amounts to 30,000 souls.

The total population of the State of Maine, is 583,000. Her principal sources of revenue are lumber and snipping, although her citizens are beginning to turn their attention to manufactures, as is shown by the large investments which have been made within two or three years past, and to the cultivation of the soil, as indicated by the great increase of agricultural products exhibited in the statistics obtained by the recent census.

Maine is the largest ship building State in the Union, and the tonnage of vessels annually built by her, is over one third of the total tonnage built by all the principal ship building States. The superior facilities, which Maine possesses in her extended seaboard,

her fine harbors and rivers, and the skill and enterprise of her citizens, have already placed her far in advance of all the other States in this branch of industry, and in the front rank as a commercial State. New York and Massachusetts, the largest ship building States, except Maine, having a total population of over four millions, built in 1850, an aggregate tonnage of 94,178 tons, while Maine, with a population of not quite 600,000, built in the same year, an aggregate of 91,211 tons. In the amount of her shipping, she is now the third State in the Union, no other States exceeding her, except New York and Massachusetts. (Note C.)

The amount of lumber annually manufactured in the State of Maine, probably exceeds 400 millions feet, which with the numerous other productions of the forest, cannot be valued at less than six millions of dollars.

BUSINESS OF THE ROAD IN NEW BRUNSWICK.

New Brunswick, like the State of Maine, has also great commercial advantages, and her principal sources of revenue are from her lumber, her fisheries, and shipping. The population of this Province does not probably vary much from 200,000 souls. This population is principally settled along and near her extended coast, and in the valley of the St. John.

The most western county through which the line will pass, is Charlotte, which contains a population of from 18,000 to 20,000, to this may be added a population on and near the frontier of Maine, which will contribute to the business of this part of the road.

I have already given the principal statistics of St. Stephens, an important town on the St. Croix, which with Calais, contains a large and active population, which will contribute to the trade of the road on each side of the Boundary, in almost an equal degree. Leaving the frontier, the line passes a few miles north of St. An-

drews, a place of importance, which is the shire town of Charlotte county. It contains a number of stores, one bank, and several public buildings, and is beautifully situated on sloping grounds, at the mouth of the St. Croix river on Passamaquoddy Bay. The exports of the port of St. Andrews and its out-bays, for 1848, were \$246,055, and the imports \$198,762. The number of clearances 810, and the arrivals 843, having an aggregate of 166,194 tons. The ships built amounted to 3,077 tons. This place is the Southern terminus of the Quebec and St. Andrews railway, an enterprise which is being pressed forward with the intention of reaching Woodstock on the St. John, at an early period. This accomplished, it will prove a valuable auxiliary to this contemplated work, and much of the trade of the Upper St. John, destined either west or east, will find this an economical and expeditious channel of communication. It also connects it with the port of St. Andrews, at which point a steamboat touches daily, thus not only accommodating that place, but giving ready access to the railway, from Eastport, Campobello and Lubec, containing in all, nearly 10,000 inhabitants.

The pleasant situation of Saint Andrews, and the picturesque scenery of Chamcook in its vicinity, will offer great attractions, and with the facilities which these railways will give, must make it a place of much resort in the summer season.

Chamcook harbor is situated some five or six miles further north than St. Andrews, is capacious and of sufficient depth for the largest vessels, and its nearer approach to the proposed eastern railway, with which it will be connected by the St. Andrews line, together with the fine water power at that place, will give it additional importance and probably add considerably to the business which will reach the road from this direction.

From this point to St. John, the line passes through or near several places where there will be a considerable amount of business. These are, St. George, at the Falls of the Magaguadavic, L'Etang

Harbor, Lepreau and Ivanhoe, at nearly all of which lumber is manufactured in considerable quantities.

St. John, situated at the mouth of the river of the same name, is the principal city of New Brunswick, and with its suburbs, contains a population of 30,000 souls. Its exports for 1850 were \$2,123,217 and imports \$3,174,189. Vessels are able to enter the harbor of St. John at all seasons of the year, it never being obstructed by ice.

The number of clearances at that port in 1850, was 1718, equal to 234,181 tons, and arrivals 1695, having an aggregate of 260,424 tons. There were owned at St. John in 1849, 505 vessels, whose admeasurement was 93,192 tons, and the number of vessels built was 63, with a total of 26,202 tons. (Note D.)

There is a large amount of lumber annually manufactured in the immediate vicinity of St. John. There are 17 saw mills, 13 of which are operated by steam, and 4 by water power. Also 6 flour mills, 5 iron foundaries, 3 breweries and 6 tanneries. The exports of lumber, &c., in 1849, were, as follows:—\$5 1-2 millions feet of deals, 107,000 tons of timber, 15 millions feet of boards and scantling, nearly 5 millions of railway sleepers, 5 1-3 millions of shingles, 279,000 clapboards and 6,392 barrels.

The public institutions of St. John, are 3 Banks, having a capital of \$2,000,000, 1 Gas Company \$120,000, 2 Insurance Companies \$400,000, Lunatic Asylum, Marine Hospital, &c., &c. The assessed valuation of real and personal estate is \$11,144,800, and income assessed \$763,272.

There are 5 steamboats running on the river to Fredericton, and 2 to Woodstock. It is estimated that there are 25,000 passengers on the river during the season of navigation; or including the stage travel in the winter season, the total number of passengers is 28,000 annually.

There are steamboats running up the Bay, to Dorchester, the Bend of Petitediac, and Windsor, and across the Bay to Digby and

Annapolis, and along the coast to Eastport, Portland and Boston. These steamers carry a large number of passengers; but I have been unable to obtain returns of the number transported.

There has been a very great increase in the travel within a few years, resulting mainly from the increased facilities, and the reduced rates of fare consequent thereon.

There is a large amount of timber, which is cut in the Northern part of the State of Maine, which passes to market through the river St. John.

A large portion of this part of the State is drained by the St. John and its tributaries, which offer almost the only means of transporting a portion of the timber to market.

A railway communication from Bangor to St. John, will have a tendency to facilitate intercourse as connected with the lumber business of that part of the State, and in effect, to increase the real value of the lands.

The lower portion of the valley of the St. John, has extensive "intervalles" of great richness and fertility. The valley is often several miles wide, and the country is in an advanced state of cultivation. It probably contains upwards of 40,000 inhabitants, who will add largely to the business of the road.

Proceeding eastwardly from the city of St. John, the proposed railway will pass through a highly cultivated and fertile country, the greater portion of the distance to the line of Nova Scotia. Much of it will compare favorably with the most fertile sections of the Western States.

A large amount of business now passes over the road between St. John and the Gulf of St. Lawrence, by the ordinary conveyances of the country. It is stated in the report of Mr. Wilkinson, that a careful registration of the travel passing various places between these points, was kept for several months in 1848, and this showed a total of 166,000 passengers, who travelled various dis-

tances on this route, and that this travel was equivalent to 57,000 through passengers, between Shediac and St. John. The amount of freight that will be transported on this part of the road will be very large, consisting of agricultural products, cattle, sheep, swine, &c., &c.

The road will touch the navigable waters of the Bay of Fundy, at the Bend of the Petitcodiac, where there is a flourishing village.

There are here 7 wharves, 5 ship-yards and several mills in the immediate vicinity. This place is 25 miles from the mouth of the river, which is navigable for vessels of 500 tons, and for vessels of 100 tons, some 10 miles further up the stream. The exports of this place are very considerable, and including the vessels which are built and sold, they are estimated at over \$100,000 annually. A steamboat runs between this place and St. John twice a week, carrying over 100 passengers weekly, and a large amount of freight. Shad and Salmon fishing is carried on here to a considerable extent. There are rich deposits of coal, gypsum, iron, &c., &c., in this vicinity. An extensive deposit of Asphaltum, said to be superior to any yet brought into market, is found not far from this place, and is now being worked.

A considerable amount of trade crosses from the Gulf of St. Lawrence to this place, the distance being but 15 miles from Shediac harbor on the Gulf.

With a branch extended to the latter place, it would draw in the trade of a large population along the coast, and from Prince Edward's Island.

There are in the counties along the Gulf 40,000 inhabitants, who will send many of their products and receive their supplies, by this line of communication.

The proposed railway, after passing the Bend of the Petitecodiac, bears more southerly, and will pass through or within a few miles of Dorchester and Sackville, both situated at the head of the Bay

of Fundy, in the midst of a most beautiful and fertile country. Dorchester is the shire town of Westmoreland county, situated at the mouth of Memrancook river, where there is a good harbor, and contains several public buildings. In this parish are found valuable quarries of free stone, gypsum, grindstones and coal strata. Its extensive marshes, which have been reclaimed from the sea, and the highly cultivated uplands bear abundant evidence of their fertility and native richness.

The Parish of Sackville is further south, bordering Cumberland Basin, and boasts the largest tract of sea alluvium in British America. The sea is shut out by extensive dykes, and the soil produces the most superior crops of wheat, oats, potatoes and grass. The uplands, bordering these marshes, are well cultivated, and produce every description of grain. Large numbers of cattle are raised in these Parishes, and the markets of St. John and Halifax are partly supplied from the products of these daries.

Taking a more general view of New Brunswick, we find that it embraces an area, according to the best authorities, of 26,800 square miles. The soil is generally favorable for agriculture, and it is estimated that two thirds of its surface may be cultivated to great advantage.

Portions of it are exceedingly fertile, particularly the bottom lands of the valleys, and the reclaimed marshes, bordering on the Bay of Fundy. Vegetation arrives at maturity in an exceedingly short time; and almost every description of grain, with proper culture, is produced in abundance.

In addition to its agricultural capabilities, it possesses great resources in the abundance of its timber, its valuable minerals, and its fisheries.

The extent to which its inhabitants have been engaged in the lumbering business, although it has been, and still is, a source of great wealth, has proved highly detrimental to the agricultural ad-

vancement of the Province. A change has taken place however, and the rapid increase of agricultural products within the last year is a gratifying indication of the increased attention of her population to these pursuits.

The coal fields of New Brunswick are of great extent, covering about one third of her territory; and, having a proper proportion of productive coal measures, it will readily appear that she has an inexhaustible supply of this valuable mineral. These mines have not been worked to a great extent; but the superior quality of the coal, the ease and economy with which they may be worked, are satisfactorily demonstrated. It only requires greater facilities of communication to develop them more fully, and to bring their value prominently before the public. The proposed railway passes over the south-eastern portion, and skirts along the southern border of this great coal field, for 70 or 80 miles, while another section or arm of this formation is in still closer proximity, extending for two thirds of the distance, from the Petitcodiac to the city of St. John, between the route of the proposed railway and the Bay of Fundy.

New Brunswick contains other valuable minerals, such as iron and lead ore, manganese, together with hydraulic and other limestone, roofing slate, marble, gypsum, potter's clay, &c., &c. She also has her mineral springs, of various descriptions; and saline waters are found directly on the route of the proposed railway, where salt is now being manufactured.

No census has been taken of the population of New Brunswick for a number of years; but it is stated by Major Robinson, in his report, that it had been estimated at 208,000, at the beginning of 1848.

It has been estimated by competent and intelligent men, who are familiar with the resources of the country, that the local trade of the road east of St. John, including the travel and agricultural products only, will amount to \$246,000 annually.

BUSINESS OF THE ROAD IN NOVA SCOTIA.

The Province of Nova Scotia and its dependencies, has an area of 19,600 square miles, and is estimated to contain 240,000 inhabitants. It is nearly surrounded with water, and possesses great commercial advantages. The exports of Nova Scotia proper, in 1849, were \$2,720,593, and if we add Cape Breton, the total exports would probably amount to nearly 3 1-2 millions. Its imports are \$4,776,561. The clearances of vessels from the various ports of Nova Scotia were 4821, of 482,854 tons, and the arrivals were 4,939, equal to 488,386 tons burthen. (Note E.)

The principal articles of exports are gypsum, coal, fish and lumber. There were exported in 1849, 240,000 barrels, 320,000 quintals and 18,800 boxes of fish, valued at \$2,032,397, and 100,000 chaldrons of coal and 60,000 tons plaster. There were 221 vessels built—measurement 29,422 tons.

The most fertile portion of Nova Scotia borders on the Bay of Fundy, and is generally in a high state of cultivation. The more productive portions about the head of the Bay, are situated in the counties of Hants, Colchester and Cumberland.

The latter is the most northern county of Nova Scotia, and is situated between the arms of the upper extremity of the Bay of Fundy. It extends across to the Gulf of St. Lawrence and includes Wallace and Pugwash harbors. The line of the proposed railway inclines to the eastern portion of the county. It is, however, only a few miles distant from the towns and harbors on each side of the Isthmus, and is sufficiently near to throw off branches to the more important points at moderate expense. Pugwash is a most superior harbor, and has 18 feet of water over the bar at low tide, and the largest ships float at all times of tide in perfect security within its basin. This is a place of considerable business. Shipbuilding and lumbering are the principal branches of industry. The

ships built in 1850, amounted to 3614 tons admeasurement. The land is of superior quality in its vicinity and well cultivated. There is a fine stone quarry near this place, and the materials for the government buildings in Halifax were obtained here.

This harbor, being but a few miles from the line of the railway, offers superior advantages for the trade of Prince Edward's Island to reach Halifax.

Wallace Bay admits large ships at high water, and the port also possesses advantages for ship-building, fisheries and the lumber trade. The average annual arrivals and clearances, at and from this port for several years past, have been 135 vessels, equal to 30,000 tons, and the exports and imports about \$135,000.

Amherst, the shire town of this County, is situated at the head of Cumberland Basin, and is surrounded by a fertile and highly cultivated country. Beside the public buildings of the county, it contains 12 stores, and is a place of considerable business.

There have been forwarded or driven from this county during the past season, 1000 cattle and horses, 1500 sheep and other animals, to the markets of Halifax and St. John.

There have also been forwarded, some 1500 firkins of butter; and the freight received there from various places, amounts to several thousand barrels. The county is estimated to contain 18,000 inhabitants, and the amount of land under the plough, is 100,000 acres, together with a great extent of meadow or grass land. Its grazing capabilities are very great, and it has a large number of cattle, sheep and horses.

This county is exceedingly rich in minerals. It has valuable coal mines at the Joggins and Spring Hill. At the latter place there is one stratum 12 feet in thickness, and the coal is of excellent quality. A branch railway of a few miles in length, would connect this valuable mine with the trunk line of railway through Cumberland. Coal makes its appearance in various localities in the

county. Small quantities have been raised on the Maccan and Herbert rivers, and it is also seen on the river Phillip. There are valuable grind-stones in this county, and large quantities are manufactured annually, and shipped to the United States. Gypsum and lime stone are found in great abundance; also numerous salt springs. A large amount of gypsum and lime is forwarded to market. The manufacture of salt is at present limited.

The total number of arrivals and clearances at and from the ports of Cumberland and Parsboro, in 1850, which are on the Bay of Fundy, in this county, were 501, measuring 33,711 tons. The total exports of this county have been estimated from the most available sources of information, at \$400,000 annually. I have not been able to obtain its total imports; but including its trade with other parts of Nova Scotia, they probably amount to \$200,000.

Cumberland county contains 100 saw mills, 16 flour mills, several collieries and 6 grind-stone quarries. Besides the trade which it has through the ports on each side of the isthmus, it has a large traffic through the country direct to Halifax.

Crossing the Cobequid Hills, the proposed railway enters Colchester county, which also extends across from the southern arm of the Bay of Fundy to the Straits of Northumberland, and like Cumberland, abounds in numerous valuable minerals. Coal, iron ore, gypsum and limestone are found in various localities. The most valuable deposit of iron ore yet discovered in Nova Scotia, is found almost immediately on the line of the railway, and is now being worked extensively. The coal measures are in the immediate vicinity of this deposit, and a workable coal-bed exists within a distance of two or three miles of the iron works. There is also an abundance of wood for fuel, at this place, and water power sufficient to propel the machinery.

A cheap and expeditious means of conveyance, available both summer and winter, will doubtless develop these mineral deposits

to a much fuller extent, and render them a source of great wealth to the country, and a large revenue to the railway.

That part of Colchester county, bordering on the Bay of Fundy, is thickly settled and in a high state of improvement. The soil is exceedingly fertile and richly repays the agriculturist for his labor.

Truro is a large and beautiful village situated at the head of Cobequid Bay, and is at the point where the great line of travel from Halifax to Pictou and Prince Edward's Island branches from that to Cumberland and New Brunswick. This is the most probable point for the divergence easterly of a line of railway to Pictou harbor, and coal mines. A lateral line in this direction is regarded of great importance, as it would extend the immediate benefits of railway communication to a large population, and vastly increase the business of the trunk line. Prince Edward's Island has a valuable trade with Halifax, and with a branch line to Pictou, this traffic and travel would mostly take this route in preference to the circuitous one by water. The area of this Island is 2,130 square miles, and the population is 62,000, which with that of Pictou county, will make a total of 90,000 inhabitants, whose products and supplies would be conveyed through this channel of communication. With a railway to Pictou, and suitable steamboats for crossing the Straits of Northumberland, the population of the Island will be brought within 7 hours ride of Halifax. Without this branch, there will be a large trade that will reach the main line from this direction.

The county of Pictou is celebrated for its extensive beds of coal, which are worked to a greater extent than at any other locality in Nova Scotia. The works are under the General Mining Association. There were raised, according to the Custom House returns for 1849, from the Albion or Pictou mines, 53,674 chaldrons of coal. Gypsum, iron ore, free stone and lime stone, are also found in this county.

The number of ships built at the port of Pictou, 1849, was 44, equal in admeasurement to 10,134 tons. The number of arrivals was 583, and clearances 765, having an aggregate of 134,653 tons. The total imports and exports were \$480,460.

The total amount of coal raised by the General Mining Association in Nova Scotia, 1849, was 113,000 chaldrons, 13,500 of which were consumed in the Province, and the balance exported. For the conveyance of this coal to market, the Association annually load 1600 vessels, and its average annual expenditure is about \$320,000.

The counties of Hants, Kings, Annapolis and Digby, situated along the south side of the Bay of Fundy, contain a large population. The country is of the most fertile character and possesses great agricultural and mineral resources.

A beautiful valley extends from the Basin of Mines parallel with the Bay of Fundy to Annapolis Basin, passing through the counties of Kings and Annapolis, a distance of 80 miles, with an average width of five miles. This valley is drained by Annapolis and Cornwallis rivers, both of which are navigable several miles. This valley and the favorable grounds in Hants county, offer great facilities for the construction of a lateral branch of railway in a westerly direction, diverging from the trunk line near the head of Bedford Basin, or in the vicinity of Grand lake.

The mineral resources of the Province are almost unlimited, and there probably is not an equal extent of territory on this continent that excels it in the variety and superior character of its minerals. It is estimated that its coal fields alone cover an extent of country equal to 2000 square miles, and iron ore, gypsum, lime stone, free stone, granite, slate and saline springs, are found in great profusion in the Province.

In view of the great quantity and favorable position of these minerals relative to the proposed railway, there cannot be a doubt, that, if relieved from all restrictions, capital will be found in abund-

ance for working the mines; and that their products, together with the ordinary business of the country, and the increased intercourse and traffic growing out of extensive mining operations, and the general benefit of railways, would of themselves make a very fair return for the expenditure required to build the railroad through Nova Scotia.

It is a circuitous voyage for vessels from the United States or Halifax, to reach the coal mines of Pictou; and one that is attended with more than ordinary danger and difficulties. Vessels can only visit this port seven months of the year, and can make only about seven voyages a year between it and Boston. It is stated by persons familiar with the navigation, that it requires from 20 to 25 days for a vessel to go from Halifax to Pictou for a cargo of coal and return. Vessels in passing through the Gut of Canso, require the wind to be in a particular direction, and they are often detained for several days by adverse winds. Insurance to the Gulf Ports in summer is 3-4 per cent., and in fall, from 1 to 3 per cent. In addition to these items of expense, there are losses arising from the suspension of navigation, already mentioned, as the coal remains on the bank exposed, for several months, to the severe winter weather, and much of it is injured so as to be unfit for shipment. Freight from Pictou to Halifax is \$1,50 per chaldron of about 1 1-2 tons, or about one dollar per ton.

The cost of transportation on railways, as well as other conveyances, depends upon the regularity of the traffic and the loads that may be carried. If trains can be uniformly loaded to the capacity of the engine, the cost may be reduced to a very low rate, on roads having favorable gradients.

With the immense deposits of coal along the line of the proposed road, there appears no reason why merchandise trains, going in the direction of Halifax, should not always be fully loaded.

On the Reading Railway in Pennsylvania, coal is transported 95

miles, at a cost to the company of 62 cents per ton, or 65-100 of a cent per ton per mile; the trains being fully loaded in one direction. This low rate is owing to the uniformity of the traffic, and great tonnage of each train.

In view of the difficulties of the navigation, the cost of transportation, and the additional cost of trans-shipment, insurance and deterioration, it is believed that coal from mines in the vicinity of the line, may be delivered in Halifax, by railway, at a rate not exceeding that transported in vessels from Pictou, and that such charge would allow reasonable profit to the railway. Cars loaded at the mines would deposit the coal directly on the wharves of Halifax, in the best condition and with the greatest regularity, both summer and winter.

Coal destined to other markets would of course be subject to transshipment from cars to vessels at Halifax, as is now the case at Pictou. But there would be a great advantage to shipping in the coal trade, to be able to continue their voyages through the winter, and in making Halifax the point of transshipment, there would be greater certainty of freights of some description from its being the great commercial town of the Province.

The demand for coal at Halifax must be greatly increased by the establishment of this line of communication.

Halifax harbor is one of the finest on the continent and of sufficient capacity to contain all the navies of Europe. Its length extending northerly and southerly is 16 miles, and at its upper extremity there is a beautiful sheet of water, known as Bedford Basin, embracing an area of 10 square miles of good anchorage. It is easy of access, and well protected by islands at its entrance, and is scarcely ever obstructed by ice.

The city of Halifax, the commercial and political capital of the Province, is beautifully situated on a declivity on the western side of the harbor, and has long been the principal naval station of Brit-

ish North America. It contains about 24,000 inhabitants, and has 4 banks, 3 insurance companies, one college, a chamber of commerce and numerous other institutions. It is an important military station also. The citadel stands on the highest grounds within the limits of the city, elevated some 250 feet above the sea, overlooking the town and commanding the harbor. The government works are the Barracks, the fortifications of the harbor, and an extensive dock yard for the repairs of ships of war. The latter is a large enclosure and contains buildings for the residence of officers, besides stores, warehouses, work shops, &c. &c. The Province building is a fine edifice, containing apartments for the Legislative Council, House of Assembly, Supreme Court and various government offices.

The number of vessels built at the port of Halifax in 1849 were 78, measuring 8229 tons. The total number of vessels arriving in that year, were 1146, having a tonnage 177,192 and the clearances were 1012 vessels, of 162,069 tons burthen. Its exports were \$1,271,922, and its imports \$3,450,745. The assessed value of real and personal estate of Halifax is \$13,714,732.

The historical associations connected with Halifax, with its numerous attractions to the pleasure tourist of the United States, in addition to its commercial importance, will invite a large and increasing intercourse upon the line of the railway, as soon as completed.

On the opposite or east side of the harbor, is situated the pleasant town of Dartmouth, which is connected with Halifax by a steam ferry. It contains many fine residences, a valuable water power and some machinery.

Relative to the travel on the proposed railway in Nova Scotia, I would observe that a registration of passengers passing three points on the route, has been kept for six months, and upon which an estimate has been made for the year, which gives over 100,000 passengers travelling on this road annually.

Having taken a general view of the resources and trade of the whole country through which the proposed line will pass, it is proper in the further consideration of the question of business, to refer to the results attending the construction and operation of railways in other States, and to be guided as far as practicable, by experience in arriving at conclusions relative to the business that may be anticipated on the proposed railway now under consideration.

I have, therefore, with a view to illustrate the subject, prepared the following tabular statement showing the population of the New England States and the State of New York, the total number of miles of railways in operation and the number of passengers and tons of freight transported, and the receipts for 1850.

TABULAR STATEMENT OF THE LENGTH, COST, RECEIPTS, &C., OF NEW ENGLAND AND NEW YORK RAILWAYS.

STATE.	Area Square miles.	Population in 1850.	Railway in operation. Miles.	COST.	No. of Passengers carried.	Receipts from Passengers.	No. of Passenger-engines to each mile.	Receipts per passenger.	Tons of Freight carried.	Receipts from Freight, &c.	Tons of Freight to each mile.	Receipts per ton.	Total Receipts.
Maine.	32,628	583,026	282	7,129,692	595,721	412,501	1.02	0.70	131,919	151,010	0.23	0.26	563,511
Massachusetts.	7,500	994,665	1,089	46,064,523	8,241,301	3,190,079	8.28	3.21	1,946,481	2,826,126	1.96	2.84	6,016,205
N. Hampshire.	9,491	318,063	512	16,363,982	1,461,933	804,583	4.60	2.53	436,706	834,605	1.37	2.63	1,639,188
Vermont.	10,212	314,322	366	10,924,138	502,809	442,106	1.60	1.41	170,291	432,100	0.54	1.37	874,206
Connecticut.	4,764	371,962	443	15,037,237	1,928,544	1,210,716	4.92	3.25	338,007	982,021	0.90	2.65	2,192,737
Rhode Island.	1,340	147,543	68	2,530,538	244,157	118,699	1.66	0.80	75,412	124,635	0.51	0.84	243,384
New York.	46,220	3,098,818	1,359	63,781,509	6,248,673	4,183,400	2.00	1.35	934,095	1,837,211	0.30	0.59	6,020,611
Totals.	112,135	5,828,419	4,084	\$162,851,619	19,123,288	\$10,362,084	3.28	\$1.78	4,032,861	\$7,187,708	0.69	\$1.23	\$17,549,792

The States embraced in the above table, have an area of 112,155 square miles, and contain 5,828,419 inhabitants. These States are intimately connected in their business relations, and trunk lines of railway traverse this territory in various directions nearly from one extremity to the other.

Viewing these States separately, we find that the railway system of each, is in different stages of advancement. In Massachusetts, it may be considered complete, and in New York, Connecticut and New Hampshire, it is far advanced. Vermont and Rhode Island have made considerable progress, while in Maine, the system may be considered as but just commenced.

The trunk lines of New Hampshire and Vermont have been so recently completed, that their benefits have been but partially realized. This is particularly the case with the latter State, her railways having been in operation only about one year.

The railways of Maine are in an unfinished state, and their connections, with the exception of one, incomplete. Further, a large portion of the population have not participated at all in the benefits of this mode of communication.

The extraordinary facilities for the conveyance of both passengers and freight enjoyed by the great bulk of the population of Maine, furnished by their line of extended seacoast, their numerous accessible harbors and their navigable rivers, sufficiently explain the reason why the introduction of railways into Maine, has been less rapid, than her character for enterprise would naturally lead us to expect. The people of Maine, celebrated throughout the country for enterprise and commercial sagacity, seem destined to achieve, by the carrying out of her railway system, far greater results thereby, than any other State of New England, if not of the Union.

It should also be recollected that many of the railways of the State of Maine, have been in operation to their present extent, but a few weeks or months, (which is the case to some extent with railways in other States), and therefore no opinion

can be formed of their business by comparing the aggregate miles, or cost with the receipts, as shown in the table. With a territory nearly equal to that of all the other New England States, and ranking next to Massachusetts in population, she has less length of railways than either of these States, except Rhode Island. It must be remembered that several of the railways of New York are restricted from carrying freight except under great disadvantages, and the total receipts from freight in that State, which has three times the population and three hundred miles more of railways than Massachusetts, are one million of dollars less than those of the latter. This is also in part owing to the unfinished state of many of her trunk and lateral lines whose traffic will greatly exceed any now completed. Many of the railways embraced in the table are subject to a far stronger competition from steamboats and vessels than can ever be brought to bear on the business of the proposed railway.

The amount of traffic, therefore, exhibited in the preceding table, is far below what it would be on the same railways a few years hence, were they to remain in their present state. When completed, however, and their connections perfected, their traffic will be vastly increased. In making use, therefore, of these results as a basis of calculation for the revenue of the proposed railway, we shall not err in assuming too great a traffic for a given population.

The following is the population, according to the best information that can be obtained on the subject, which will in part make up the business of the proposed railway.

State of Maine, according to the recent census,	-	583,000
Province of New Brunswick,	-	208,000
do. Nova Scotia,	-	220,000
Prince Edward's Island,	-	62,000

Total population, 1,073,000

In the above, the population of Nova Scotia embraced in Cape

Breton, from 40,000 to 45,000 inhabitants, is omitted as being too remote to add materially to the business of the road. The population of Prince Edward's Island which will be accommodated by the road both in New Brunswick and Nova Scotia, is included.

From the character of this population and the resources of the country, there appears to be no reason why, in the course of a few years, it should not produce as large a proportional amount of business as that shown in the table.

The inhabitants have a common origin,—and the same indomitable energy of character, which every where characterizes the Anglo Saxon race. It is true, that this population has not yet made great advances in manufactures or agriculture; but this is not because the soil is unfit for cultivation or that there is a lack of enterprise. It is owing to the want of facilities for transportation and the means of rapid and economical communication with a market. There is little encouragement for agricultural, mining or manufacturing enterprise in a country where the cost of transportation is nearly or quite equal to the value of articles produced. The same inactivity existed in all the industrial pursuits of the States, referred to, before the introduction of canals and railways; and these are the instruments which have created business and wealth; and to which may be attributed in a great degree, the success and character of their inhabitants.

It may be thought that this proposed railway is near the coast and consequently it will not be able to compete with vessels in the transportation of freight. This is not so great a disadvantage, as at first might appear; for the railway, touching occasionally the ports along the coast, which are always points of business and markets of the country, will in this case accommodate the trade of the interior in a greater degree by taking the products to these markets and returning their supplies from the same points. Nearly the whole line within the State of Maine is from 30 to 40 miles from the coast, each extremity having a connection with navigation.

The country along the line from Milford to within a distance of 20 miles of Calais, is unsettled, though the land for a large portion of the distance is of superior quality, and the immense quantities of valuable timber which it contains will furnish a large amount of business to a road in operation, though it can contribute but little to secure its construction.

That portion of the line in New Brunswick west of St. John, approaches nearer the coast, while that part east of that city will pass through a valley of surpassing fertility for 90 miles, having no access to navigation except at either extremity, and no market but that above mentioned.

The whole of the line in Nova Scotia is directly through the interior of the country to the chief market of the province. The navigation to the various points is circuitous, often dangerous, and subject to great delays and difficulties, and for five months of the year, is entirely interrupted,

The navigation from St. John, westward, to Portland, a distance of 300 miles, is closed at all ports where the railway touches, and no steamboats run between these points during the winter.

With this proposed railway completed, merchants will not purchase six months stock of goods at once, but will order them from time to time, taking advantage of the market in making their purchases, and supplying their customers at all times with fresh and seasonable goods.

From the preceding table it appears that, comparing the total receipts on all the railways from passengers, with the population, they are equal to \$1,78 to each inhabitant, and that the receipts from freight amount to \$1,23 per inhabitant or for both they are equal to \$3,00 per capita of population. With a view to make full allowance for what might appear a difference of circumstances of this population, and to make such an estimate as will, it is believed, fall below the actual business which will be secured on this route,

we will place the receipts from the business of this population, at only one half the above, or at the rate of one and a half dollars for each inhabitant.

There are other important sources of revenue which it is now proper to consider.

The great and primary object of this railway is in connection with other roads to shorten the transit between Europe and America.

The astonishing increase of population and wealth of the United States have created great changes in the commercial relations of the world, and more rapid and safe means of transit between Europe and America have taken the place of the former tedious modes of communication.

It is comparatively but a few years since it was deemed a doubtful enterprise to establish a line of sailing packets between New York and Liverpool although but two vessels of 450 tons burthen were at first placed on the line. What has been the result? This line not only succeeded, but other lines from all the principal Atlantic cities were soon established, and success attended them all. So great an increase of intercourse from year to year, soon made it evident that more rapid and regular means of transport must be introduced to meet the expectations of the public.

Enquiring minds directed their investigations to the use of steam power, as the agency by which this was to be accomplished. It was confidently pronounced, by scientific men, to be impracticable to navigate the Atlantic ocean by steam. It seemed to have been forgotten in 1837, that, as far back as 1819, a steamer had made a successful voyage across the Atlantic. A steamer sailed from Savannah, May, 1819, having the same name as that of the port from which it sailed, and reached Liverpool in safety.

In September, 1833, the Royal William, of 180 horse power and 100 tons burthen, sailed from Quebec to Pictou and thence to London.

But it was not till 1838 that the practicability of ocean steam navigation was fully established, by the arrival of the "Sirius" and the "Great Western," one from Liverpool, and the other from Bristol, in New York harbor. To sketch the progress of the British Steam Marine for the last thirteen years, would furnish a history of one of the most interesting series of events on record.

In 1848 the Ocean steam ships of the British Government, formed a grand aggregate of 115 in all, and the number has since been largely augmented.

Regular lines are established to India by the Red Sea route, to Australia, to the West Indies, to Panama and the Pacific, to various ports of Europe, in addition to the North American line known as "Cunard's Line," whose contract embraces 9 first class steamers, running alternately between Liverpool, and Boston and New York.

The progress of steam navigation in this country, for the last five years has been still more rapid. Our Government have recently established lines to Liverpool, to Bremen, to Havre and Glasgow. The contract for these lines contemplate the running of 13 steamers the present year. During many weeks of last year, no less than four arrivals of ocean steamers from Europe occurred in each week, and a daily arrival may be safely anticipated within a few years at farthest.

The average time of the eastern passages of the Collins line between New York and Liverpool for 6 months, from May to October 1850, inclusive, was 11 days, 12 hours and 51 minutes, and the average of the western passages was 11 days, 13 hours and 13 minutes. These facts show a slight saving on the average time by the Cunard line, for the same period, amounting to only one and a half hours on the eastern passages, but on the western passages there is a difference of about one day.

The shortest voyages which have yet been made were by the steamship Asia of the Cunard line, from New York, which was 10 days, 9 hours and 30 minutes, and the recent trip of the Pacific of the Collins line, from Liverpool to New York in 9 days, 20 hours and 15 minutes.

There can be no doubt but that great improvements will be made in the model and machinery of steam ships, by which their speed will be materially increased. But there are other means which may

be resorted to which will aid in an important degree in accomplishing this desirable object. It is proposed to make Galway or some port on the western coast of Ireland, and Halifax in Nova Scotia, the points of departure for steam ships, and this reduces the length of voyage about one third from that between Liverpool and New York, consequently the tonnage of fuel may be reduced in like proportion. Vessels running in connection with railways at either extremity of the voyage, should be confined to the transportation of passengers and the mails, or at most, should be permitted to transport only light and valuable merchandise. Vessels therefore of increased size and strength, with more powerful engines, less weight of fuel, with only so much freight as may be required for steadiness, would doubtless attain much greater speed in running between these points, than could be made by the same vessels with fuel for a voyage one third longer and loaded with freight. This saving in time and the further saving by the use of railways from Galway to London and from Halifax to New York, upon which the speed will be more than double that of the steamers, would probably make a saving of some two or three days from the time required by the present mode of conveyance between London and New York.

By this line, passengers will have railway conveyance from New York and all the cities of the Union, and from Quebec, Montreal and every part of Canada to Halifax, where they would take the steamers for Galway direct, crossing Ireland by railway to Dublin, the channel by steamboat to Holyhead, thence to London and every part of England by railway.

This line would not only materially reduce the length of the time required for the whole journey, but lessen by one third the length, the annoyances and dangers of the voyage across the Atlantic.

It is maintained by some, that passengers generally, would embark at Liverpool and land at New York, thus performing the whole journey by water, in preference to travelling by railway to Galway, taking the steamer to Halifax, and thence by railway to New York, or having arrived at Halifax would prefer to continue on in the steamer to Boston and New York.

It is hardly necessary to argue this point, for it does not appear probable that any person who has ever experienced the annoyance

of a sea voyage, would choose to embark on board of a vessel, thereby increasing the danger and length of his journey, in preference to a comfortable seat in a railway car.

With cars especially arranged with sleeping accommodations for passengers requiring the greatest dispatch, and with the improvements of track which are attainable by the adoption of the continuous rail and other changes, the traveller will be relieved from any apprehensions of increased fatigue over that by the sea voyage from Halifax to New York.

Whatever may be the result, as far as relates to passengers residing at New York city and south of it—in reference to all those residing north and east, there cannot be a question as to the course they will ordinarily take.

A merchant of Montreal for instance will by the proposed railway, be able to reach Halifax with nearly the same ease as he can travel to New York. He will therefore shape his course so as to economise time and expense, in making his passage to and from Europe.

In order to do justice to the argument in favor of this plan for shortening the transit between Europe and America, we must suppose the various projected lines having this object in view, to have been constructed and the question of time and cost both reduced to their lowest point, instead of being considered with reference to the present condition of railway facilities.

Looking at the question in this aspect it will be seen that passengers will seek to avoid all unnecessary travel, and will direct their attention to the shortest practicable line across the ocean.

In making the passage to and from Europe, the point of embarkation nearest the opposite shore will always be preferred to any other, more especially when it favors increased security from sea risks, and is likely to shorten the voyage.

With these principles admitted, a large portion of the present travel to Europe will necessarily seek the easternmost point of embarkation in Nova Scotia, which may be selected for the terminus of this line. It is known that Canada, New England and the Lower Provinces furnish a large proportion of the present travel.

Again, the route to and from Europe, which is the most certain and the shortest in the point of time, must eventually become the cheapest and therefore the most frequented.

No one can question this who regards the commonest principles of commercial economy. A passage to Europe will in very few years become a matter of as common occurrence as a journey now from New York to Niagara Falls.

Ocean steamers at the present time charge at the rate of about six cents per mile from the fact that the number of passengers is too limited to admit of a reduction of price, or because the proprietors of the existing lines demand exorbitant profits on their investments. If the number of passengers should be increased four fold the price of passage might be reduced one half at least. This result will be very shortly reached.

The rapid increase of wealth and refinement in the United States will in a very few years lead the pleasure travel that now seeks our fashionable summer resorts, to spend their leisure in the same manner among the highlands of Scotland, or on the Rhine.

The same or similar results, will be witnessed in relation to the travel from Europe to America, which always has been and still continues to be greater than the travel from America to Europe. This great increase of travel will operate to reduce the price of passage in the same manner and to the same extent as it has operated upon the lines of railway in this country.

The consequence of this state of things will be as marked upon the character and the business of the two continents as the increase of railway facilities has been upon the character of the people of the different States of the Union.

It is well known that the most dangerous part of the voyage between New York and Liverpool is in approaching either port. Steamships after leaving New York or Boston harbor for Europe, sail along the American coast for some 800 or 1,000 miles, often enveloped in the thick fogs which so frequently prevail, and these difficulties and dangers to a certain extent are encountered in approaching or leaving Liverpool. It is on this part of the voyage that most of our disastrous shipwrecks occur.

But travelling this portion of the distance by railway, these dangers and annoyances are avoided, and the embarkation is made at points which permit vessels almost immediately to leave the coast and thus escape its perils.

Experience shows that where the railway and steamboat come

in competition, the former uniformly commands the mass of passengers. We have numerous instances in our own and neighboring States which have demonstrated this in the most satisfactory manner. We have steamboats between Portland and Boston, yet the two lines of railways carry nine tenths of the passengers that reach Boston from the east, although the fare is usually double that of the steamboat.

When the New York and New Haven railway was proposed, it was an almost universal opinion that it could not succeed, from the fact that it was located along the shore of Long Island Sound and would have to sustain a direct competition with steamboats of the most superior character for speed elegance and comfort. Up to that time they had supplied the connection between the cities above mentioned.

The splendid steamer Connecticut had accomplished the passage in the short time of three hours and forty-five minutes, equal to 21 miles to the hour. It was thought that the dangers of the passage were not greater than by railway, as the Sound was land-locked between these cities, affording a navigation more safe and free from detentions than most rivers. Besides this, the road having a considerable extent of 40 feet grades with many draw bridges and but a single track, it was supposed that it would be subject to delays and dangers not often encountered on other roads, and consequently the mass of passengers would prefer taking a steamer. It was also urged that the steamers, even with their magnificent accommodations and sumptuous tables, could be sustained by rates which would prove ruinous to a railway.

In opposition to these opinions, the railway was built, and when completed and opened for travel, there were two first class steamboats running to New Haven, one to Bridgeport and one to Norwich, touching at the intermediate towns. At the present time there are no first class boats on the route, and but two freight boats, and although their fare is but half that by the railway, they carry very few passengers.

There are now running on this railway five passenger trains each way daily between New Haven and New York, and one train each way daily between the latter place and Bridgeport, besides other trains running less distances. In addition to this there have been

three freight trains each way daily for a portion of the year.

This illustrates in a forcible manner, the capabilities of railways to compete with steamboats not only for passenger but for freight. In this case it is not a simple division of the business between the two modes of conveyance, but it amounts to almost a complete monopoly of the business by the railway. There were transported on this road during the year 1850, 652,122 passengers and its net receipts are equal to 7 per cent on an average cost of \$56,000 per mile. The Superintendent of this road says, "I am well satisfied that the question is fully settled on this route, that steamboats cannot be sustained in competition with the rail road."

The Hudson River Railway is located on the immediate banks of that river, from New York to Albany, a distance of 144 miles, and is subjected to competition from steamboats which are universally admitted to be the fastest and most magnificent steamers in the world. The navigation is unsurpassed for safety, and the beauty of the scenery along its banks renders the sail up this river the most attractive of any perhaps on this continent.

Two months after the road was first opened from New York to Peekskill, a distance of 43 miles, an account was kept of the number of passengers that left and arrived by the steamers, at Sing Sing, Dobbs Ferry and Yonkers, for 6 days in succession. This showed that the railway carried about 84 per cent of all the passengers, notwithstanding the fare was nearly double that of the steamboats. While the railway was in operation no further than Peekskill, the fare from that place to New York was 55 cents, while the boats at first charged 37 1-2 cents and then reduced their fare to 25 cents, but having so little business even at that low fare, they were obliged to withdraw and leave the whole business to the road.

At the present time the railway is in operation to Poughkeepsie, which is one half its length, and the same results thus far attend its extension. The Albany way boats were discontinued during the last season, for the first time it is believed, since the running of steamboats on the river. The steamers, although of the best description, and the fare varying from one to two dollars, from New York to Albany, cannot command the travel. They require from 8 to 9 hours to make the passage, while the railway can transport passengers over this route in 4 1-2 hours, and this alone is sufficient

to turn the travel to the railway, at rates of fare fifty per cent above the steamboats.

The number of passengers transported on this railway, only one half of which is in operation, for nine months of the year 1850, was 509,180.

The manager of this railway says, "We consider the question settled as to the practicability of successfully competing for passengers with the best line of steamboats in the world."

Railways have been constructed on and near the coast in nearly all the Atlantic States, are in progress or contemplated along the banks of the St. Lawrence and the shores of Lakes Champlain, Ontario and both sides of Lake Erie. On all of these waters first class steamers are running with great success. Railways are also being constructed parallel and near to many of the navigable waters of the Western States.

The question as to the ability of railways to command the travel in all places where they may come in competition with steamers, appears to be fully settled.

With reference to the proposed eastern line, it may be observed that all the reasons which induce the travelling public to give their preference to railway communication over that by steamboats, in the cases referred to; apply with far greater force on this line, and there can be no doubt whatever, but that it will command the mass of travel crossing the Atlantic.

In further estimating the probable income of the road, I regard it safe to assume that steamers will cross the Atlantic daily with an average of fifty passengers each way. In estimating the probable receipts from this source I will however assume only 35 passengers each way or 70 per day over the railway.

The transportation of the mails must be a source of increasing revenue from the circumstance that this railway will enjoy a comparative monopoly of the transmission of intelligence and can therefore command the most favorable terms from Government.

The compensation paid to similar lines by the United States for the carrying of the mails is at the rate of \$300 per mile per annum. At this price a handsome income is secured. But it may be fairly contended that the price of transporting the mails between London and New York may be shared by the railways and the steamers in

the proportion to the distance run by each, or in some similar mode.

By adopting this rule a large revenue will at once be secured to the road by a contract for carrying the mail.

The Cunard line receives annually £145,000 sterling as a compensation for carrying the mail fortnightly for four months and weekly for the remainder of the year, equal to 44 trips each way or 88 in all. This will give a compensation equal to £1647 sterling or over \$7,800 per trip.

The compensation of the Collins line is equal per trip to that paid by the English Government, and the aggregate amount now paid by the British and American Governments to the several lines, would probably fully compensate for a daily line by a single company the shorter distance. Allowing two thirds of this aggregate for the sea route and one third to the railways, some estimate may be formed of the probable mail compensation to the railways, between New York and Halifax.

If an increase of speed is required for the mail trains, a proportionate increase of compensation may be reasonably expected.

Bringing the various items of business together, as hereinbefore set forth we have the following estimate of the probable annual receipts of the proposed railway:—

1,073,000 inhabitants, estimated to pay the railway one half the amount shown in the preceding table or \$1,50 for each inhabitant.	\$1,609,500
35 steamer passengers each way over the railway at 2 1-2 cents per mile, or \$10,50 each	229,320
Transportation of mails \$300 per mile per annum	126,000
	<hr/>
Total annual estimated receipts	\$1,964,820
Deduct 50 per cent for expenses of operating the road.	982,410
	<hr/>
Estimated net receipts	\$982,410

Which is over 7 3-4 per cent on \$12,600,000, the estimated cost of the railway.

It is proper before closing this report, to express my obligations to the Hon Amos Pickard, for the valuable service rendered by him as Commissioner under the appointment of your Excellency.

To R. T. Bailey, Esquire, Engineer, having the immediate charge of the field operations, and to the gentlemen acting under his direction, I am indebted for the able and prompt manner in which so extensive a survey was accomplished in the short time allowed for this service.

For the neatness, skill and accuracy with which the drawings illustrative of the surveys, have been executed, I am indebted to Mr. J. B. Cummings.

The duty assigned by the commission which your Excellency was pleased to tender me, might have been regarded as confined to the task of ascertaining the practicability of locating a line of railway from the city of Bangor to the Boundary of New Brunswick, in the direction of the city of St. John.

I should not have deemed the service assigned me well performed had I omitted to set forth, though in a very imperfect manner, some of the advantages which the completion of the European and North American Railway, as one great intercolonial and international work hold out to the State of Maine, and to the whole Union. This duty I have attempted to discharge in a manner that would give the greatest amount of useful information in reference to the practicability of that great enterprise, which the limited appropriation made by the Legislature would enable me to furnish.

The entire practicability of the route for the construction of a first class railway from the present terminus of the most eastern line from New York city, to the city of Halifax, is now ascertained.

The European and North American Railway, regarded merely as a Corporation within the State of Maine, is a matter of trifling moment in comparison with the importance it assumes as a link in the chain of the great international work to which I have devoted so large a portion of this report. - It would however, without any reference to its connections beyond our own borders, be a work worthy of the highest confidence of the public, and of the most vital importance to the whole eastern portion of Maine.

In submitting these observations to your Excellency, I may be allowed to adopt the language of the Portland Convention as appropriately expressing my own sense of the importance of the European and North American Railway:--

“This great Railway, connected as it will be with Ocean

Steam Navigation and the railway systems of the whole of Europe and America, which traverse Empires, Kingdoms, Colonies and States for the advantage of all, deserves to be regarded, not by the commercial world alone, but by the statesman, the lawgiver and the philanthropist, as one of the greatest links in that mighty chain which is fast encircling the earth, strengthening the bonds of brotherhood and christian fellowship, multiplying the ties of lineage, and helping to constitute of all mankind, but one great Commonwealth of Nations."

I have the honor to be,

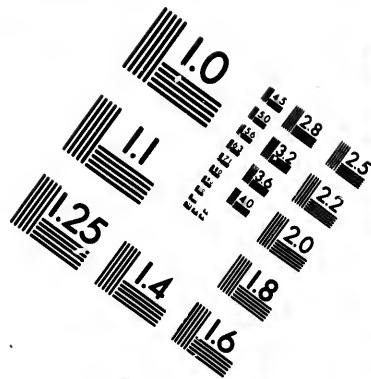
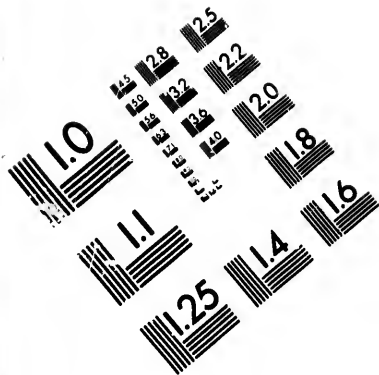
Your Excellency's

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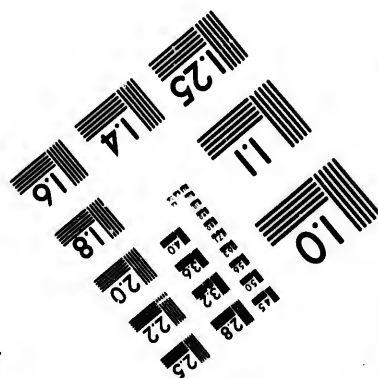
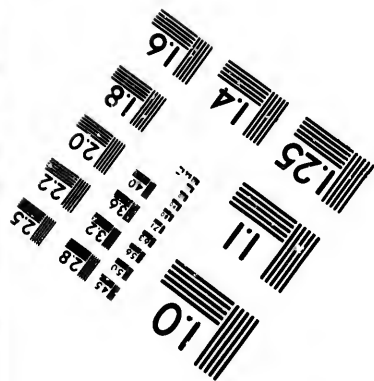
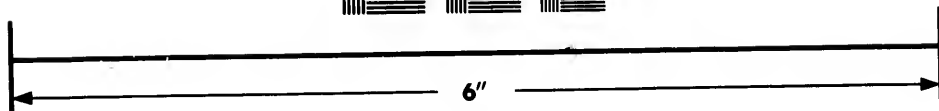
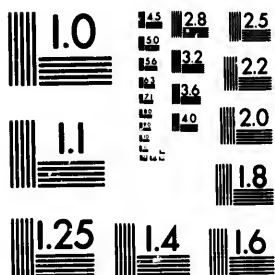
A. C. MORTON,

Civil Engineer.





**IMAGE EVALUATION
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APPENDIX.

NOTE A.

Statement of the amount of lumber surveyed at the city of Bangor,
from 1832 to 1850 inclusive.

YEAR.	AMOUNT. Feet.	YEAR.	AMOUNT. Feet.	YEAR.	AMOUNT. Feet.
1832	37,987,052	1838	85,392,117	1844	121,130,974
1833	45,442,566	1839	89,806,630	1845	171,688,737
1834	25,624,718	1840	71,726,622	1846	140,085,012
1835	73,416,065	1841	77,091,793	1847	191,136,272
1836	46,519,921	1842	111,317,201	1848	212,932,499
1837	64,720,008	1843	113,798,619	1849	160,418,808
				1850	203,754,201
6 years	293,810,330	6 years	549,132,982	7 years	1,201,146,503

NOTE B.

Summary statement of arrivals and clearances to and from the
port of Bangor, from Jan. 1st, 1850 to Jan. 1st, 1851, with the ag-
gregate amount of the principal articles of imports and exports dur-
ing the same period:

Arrivals of vessels,	3,567
Clearances of vessels,	3,574
Imports, Corn, bushels,	250,000
" Flour barrels,	90,000
" Pork, barrels,	8,000
Exports, Lumber, Boards and Deal. B. M. Feet,	203,754,201
" Laths,	40,000,000

Exports, Pickets,	-	-	-	3,000,000
" Shingles,	-	-	-	110,000,000
" Clapboards,	-	-	-	5,000,000
" Hacmetac Knees,	-	-	-	30,000
" Hemlock Bark, cords,	-	-	-	13,000
" Box Shooks,	-	-	-	250,000
" Pine Masts,	-	-	-	500
" Juniper Timber, tons,	-	-	-	4,000
" Cedar Sleepers and Posts,	-	-	-	100,000
" Bricks,	-	-	-	5,000,000
" Spars and Piles,	-	-	-	10,000
" Fish Barrels,	-	-	-	150,000
" Heads, shooks and nests of dry casks,	-	-	-	40,000
" Hoops and Hoop Poles,	-	-	-	1,000,000
" Sheep and Calf Skins,	-	-	-	50,000
" Pig Iron, tons,	-	-	-	1,000

NOTE C.

Tonnage of Ships built in the principal ship-building States from 1845 to 1850, inclusive.

Year.	Penn.	N. York.	Mass.	Maine.	Maine exceeds Penn.	Maine exceeds New York.	Maine exceeds Mass.
1845	15,810	29,343	25,961	31,105	15,296	1,763	5,144
1846	15,784	33,753	24,321	49,747	33,963	16,494	25,426
1847	24,126	50,994	27,769	63,548	39,422	12,554	35,779
1848	29,638	68,434	39,366	89,974	60,336	21,540	50,608
1849	24,007	44,104	23,888	82,255	58,248	38,151	58,367
1850	21,409	58,342	35,836	91,211	69,802	32,869	56,375
Total	130,783	284,969	177,141	407,840	277,057	123,371	230,699

Total amount built by these four States in six years, 1,000,733 tons, of which Maine has built 407,840, equal to 40 3-4 per cent of the whole.

Tonnage of Shipping owned in the principal commercial States, from 1845 to 1850, inclusive.

Name of State	1845.	1846.	1847.	1848.	1849.	1850.
NEW YORK,	625,875	655,695	747,024	845,788	911,280	942,548
MASS.	524,994	541,520	577,310	641,288	636,599	685,441
MAINE,	320,059	358,123	381,353	456,655	466,488	501,421
LOUISIANA,	170,525	181,258	213,538	227,009	241,497	250,089
PENN.	147,802	148,066	182,997	211,552	231,652	258,939

NOTE D.

The Imports into St. John in 1850, were,	-	\$3,174,189
“ Exports from “ “ “ “ “	-	2,123,217
“ Imports into St. Andrews in 1848, were,	-	194,782
“ Exports from “ “ “ “ “	-	246,055
Total for the years 1848 and 1850, Imports		\$3,358,971
“ “ “ “ “ “ “ Exports		2,369,272

The clearances of vessels from St. John in 1850, were 1718, equal to 284,181 tons.

The arrivals of vessels at St. John in 1850, were 1695, equal to 260,424 tons.

There were owned in St. John in 1849, 505 vessels, equal to 93,192 tons. And the vessels built were 63, equal to 26,202 tons.

The tonnage arriving at all the ports of the Province in 1848, vessels, 3,034. Tons, 467,398.

The outward tonnage in 1848, vessels, 2978. Tons, 463,309.

Number of vessels built in New Brunswick in 1847, vessels, 115. Tonnage, 53,372.

The total Imports of New Brunswick in 1850, were \$3,771,895

“ “ Exports “ “ “ “ “ “ “ \$3,108,010

NOTE E.

IMPORTS.

NAMES OF PLACES.	SHIPS INWARD.				ESTIMATED VALUE. \$.			
	U. Brit & Colon's	United States	Foreign States	Totals	From Great Britain & Colonies.	From the United States.	From Foreign States.	Totals.
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
Halifax.	643	94,496	329	65,657	168	17,039	1,146	177,192
Annapolis,	119	11,664	123	7,707	242	19,371	1,863	486
Argyle,	7	914	103	4,447	110	5,361	18,134	
Arrichat,	65	4,305	167	12,700	238	17,472	41,458	
Barrington,	30	4,309	29	1,425	59	5,734	6,295	
Cumberland,	27	2,242	56	4,054	83	6,296	18,125	
Cornwallis,	56	1,582	12	924	69	2,626	7,474	
Digby,	145	9,444	499	32,947	1	129	28,387	
Guy'sboro',	7	250	55	3,696	7	250	6,387	
Liverpool,	52	6,655	28	1,767	128	12,417	9,550	
Lunenburg,	4	228	28	1,718	36	2,432	2,250	
N. Edinboro',	33	1,230	267	17,180	300	18,410	9,268	
Parsboro',	31	1,245	153	10,301	184	11,546	10,112	
Pictou,	242	17,396	237	40,999	4	729	114,528	
Shelburne,	20	1,885	31	1,750	63	4,348	21,830	
Sidney,	277	24,356	248	20,962	45	2,606	98,378	
Wallace,	27	5,161	6	1,718	34	7,169	42,864	
Windsor,	82	8,139	199	18,783	281	26,922	24,764	
Yarmouth,	73	6,373	164	12,757	261	21,252	33,048	
Totals,	1,946	201,927	2,706	259,774	2,267	266,854	488,386	2,359,223
							1,711,820	705,422
							4,776,465	

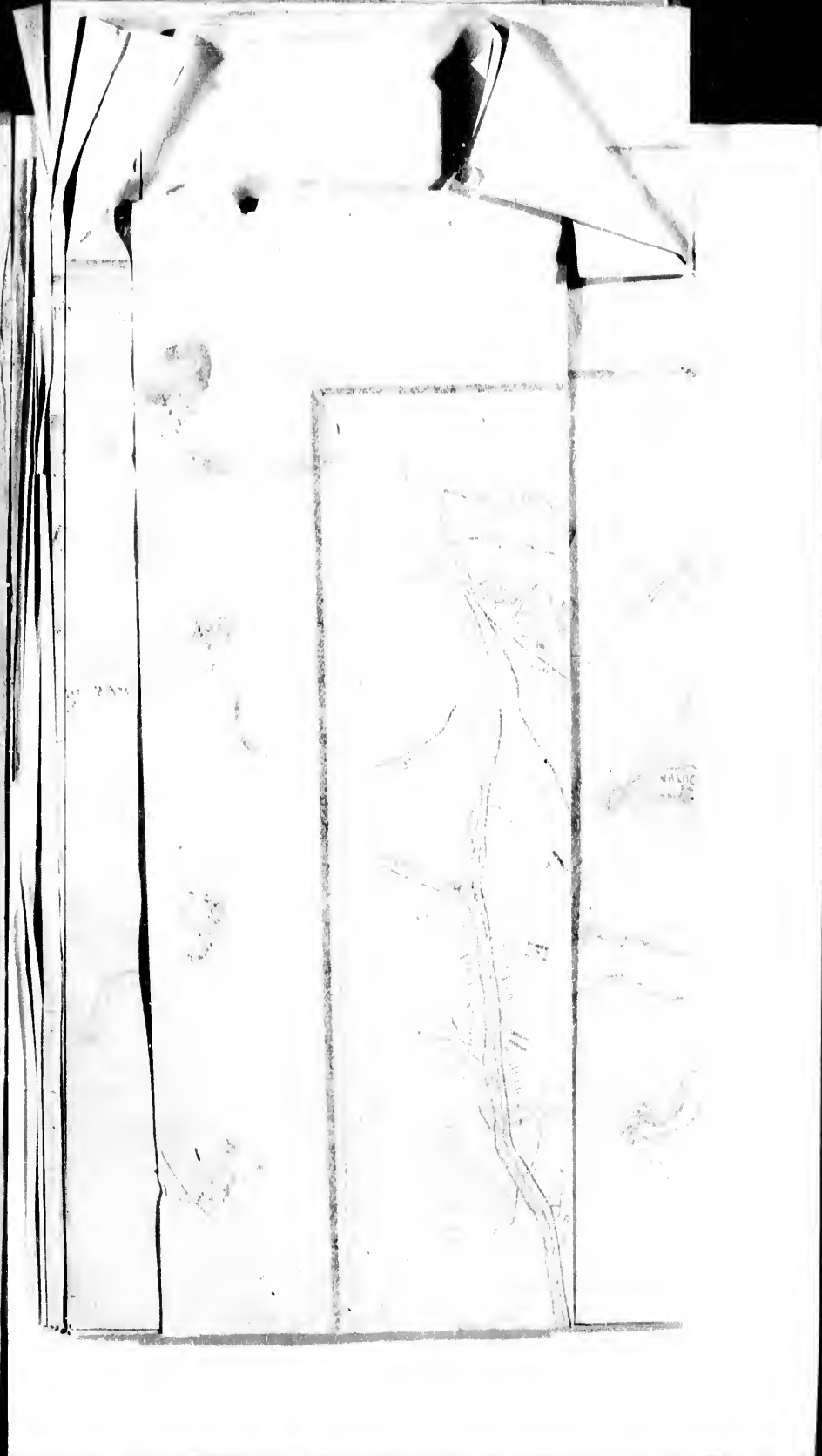
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NOTE E.

EXPORTS.

NAMES OF PLACES.	SHIPS OUTWARD.										ESTIMATED VALUE. \$.			
	U. S.		United States.		Foreign States.		Totals.		To Great Britain and Colonies.	To United States.	To Foreign States.	Totals.		
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.						
Halifax.	721	98,478	235	57,797	58	5,794	1,012	162,069	743,490	364,932	156,509	1,264,961		
Annapolis.	8	774	112	4,995			120	5,768	8,662	6,403		15,065		
Argyle.	165	10,825	253	13,650			318	24,484	19,681	15,500		35,181		
Archet.	59	4,506	20	1,444	7	754	86	6,704	60,892	14,652	35,104	110,648		
Barrington.	43	1,734	29	1,223	1	140	73	3,097	20,604	13,653		34,257		
Cumbarland.	38	2,661	35	2,186			73	4,847	12,348	27,203		39,551		
Corwallis.	55	1,437	38	2,777			93	4,214	21,913	21,555		43,468		
Dagby.	150	9,708	418	28,004			568	37,712	19,783	31,981		51,764		
Gayboro.	8	369					8	369	3,472			3,472		
Liverpool.	111	13,783	33	1,730	7	779	151	16,342	175,158	7,435	8,168	190,761		
Lunenburg.	10	949	26	1,497			36	2,446	20,772	10,316		31,088		
N. Edinboro.	20	740	297	17,950			317	18,720	18,799	33,663		52,472		
Pictou.	223	15,438	541	60,075	1	26	765	75,538	56,910	205,970	286	263,166		
Paraboro.	42	3,255	119	7,767			161	11,022	19,424	14,772		33,996		
Shelburne.	32	2,040	6	243			38	2,283	54,587	1,445		56,435		
Sidney.	259	24,383	138	13,497	26	1,975	423	39,855	188,679	64,016	42,762	295,456		
Wallace.	64	17,533	3	270			67	17,802	93,173	1,392		94,565		
Windsor.	47	5,947	208	24,863			295	30,810	10,262	23,047		33,309		
Yarmouth.	108	11,391	105	7,097	4	281	217	18,769	58,098	9,225	3,473	70,716		
Totals.	2,113	225,951	2,606	247,154	102	9,749	4,821	482,854	1,606,697	867,592	246,302	2,720,591		

Totals, . . . 2,113 225 951 2,606 247,154 102 9,749 4,821 482 9541,606 697 867,592,246,302 2,720,691



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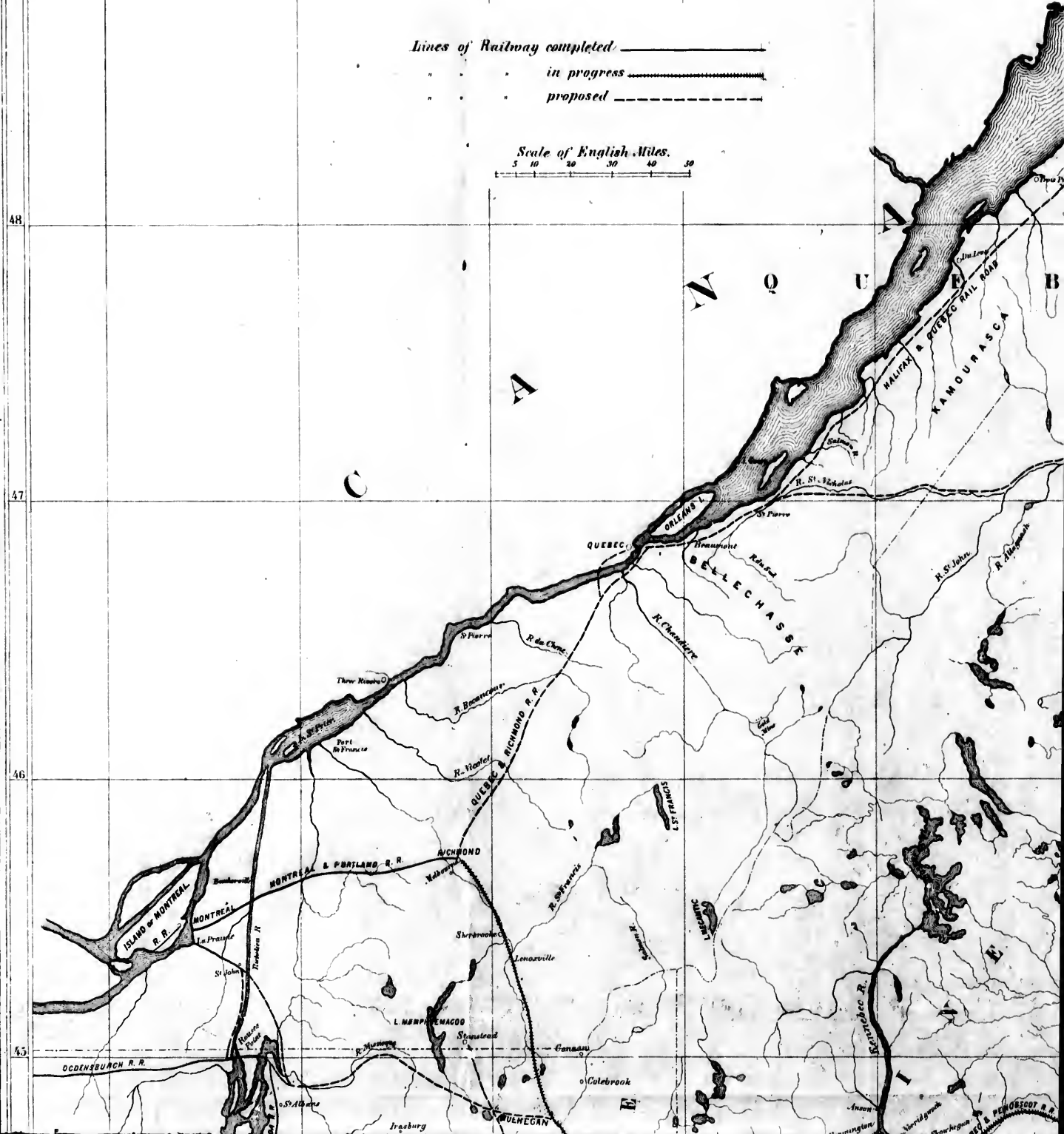
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Lines of Railway completed —————
 " " " in progress —————
 " " " proposed - - - - -

Scale of English Miles.
 5 10 20 30 40 50





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68

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66

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64

RIVER ST LAWRENCE

G A S P E

BAY OF CHALEUR

D

A

V E N T U R E

B

E

C

R E S T I G O U C H E

C L O U G E S T E R

KAMOURASCA

CARLETON

NORTHUMBERLAND

N E W

B R U N S W I C K

K E N T

P I N C H

New Brunswick Land Co.

FREDERICTON

WESTMORELAND

NORTHUMBERLAND

LINCOLN

CHARLOTTE

ST JOHN

ALBERT

CUMBERLAND

NORTHERN ROUTE

MIDDLE ROUTE

SOUTHERN ROUTE

H U N D Y

MINES CHANNEL

MINN'S HASEN

ANNAPOVIS

A B U R G

HANTS

GRAN



RIVER ST. LAWRENCE

G A S P E

B O N A V E N T U R E

BAY OF CHALEUR

KAMOURASKA

R E S T I G O U C H E

G L O U C E S T E R

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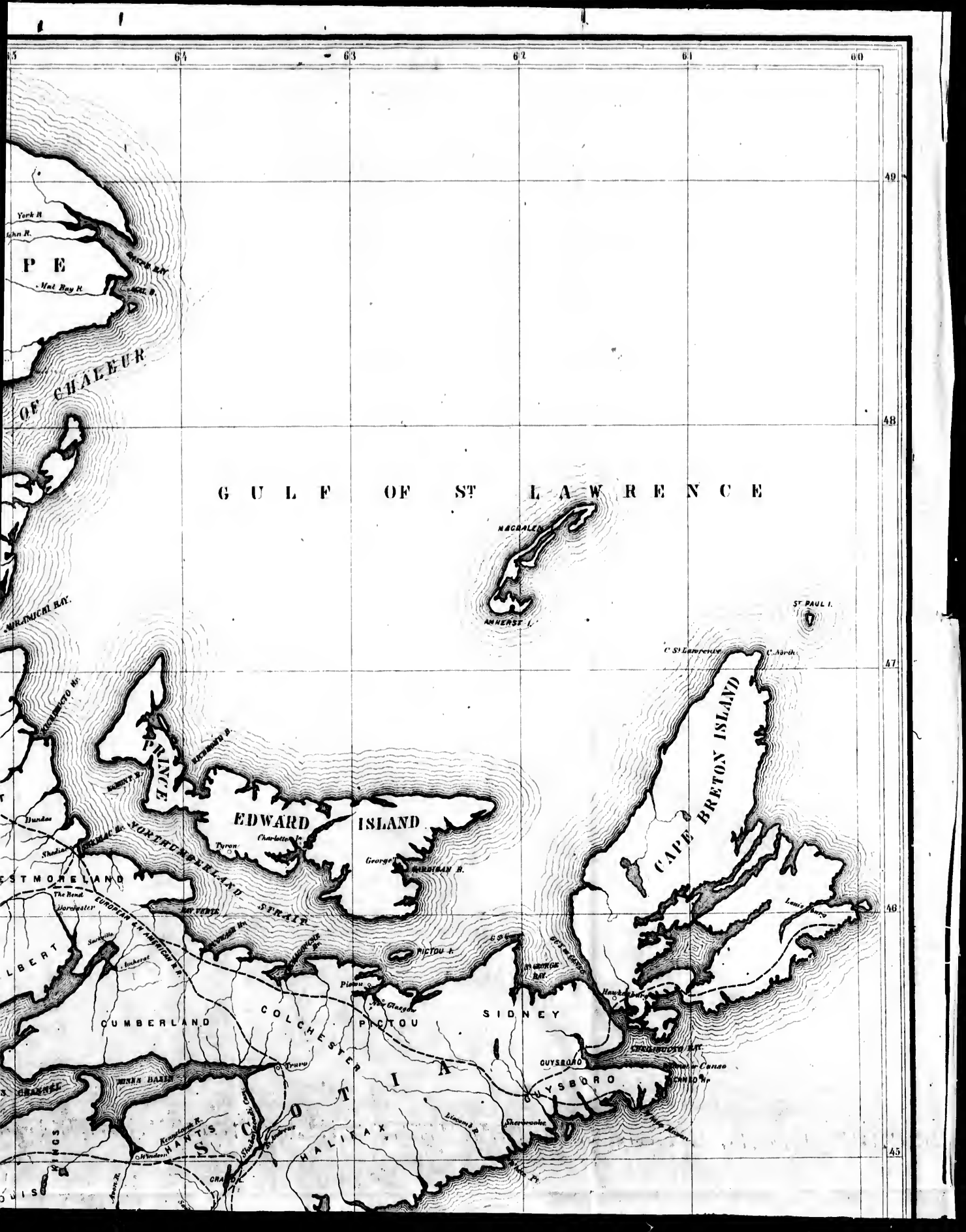
C U M B

E U R O P E A N & N A M E R I C A N R. R.

N O R T H E A S T E R N R. R.

N O R T H E A S T E R N R. R.

N O R T H E A S T E R N R. R.



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GULF OF ST. LAWRENCE

OF CHALEUR

York R.
John R.
Met. Bay R.
St. John R.

MINICAL BAY

MAGDALEN I.
AMHERST I.

ST. PAUL I.

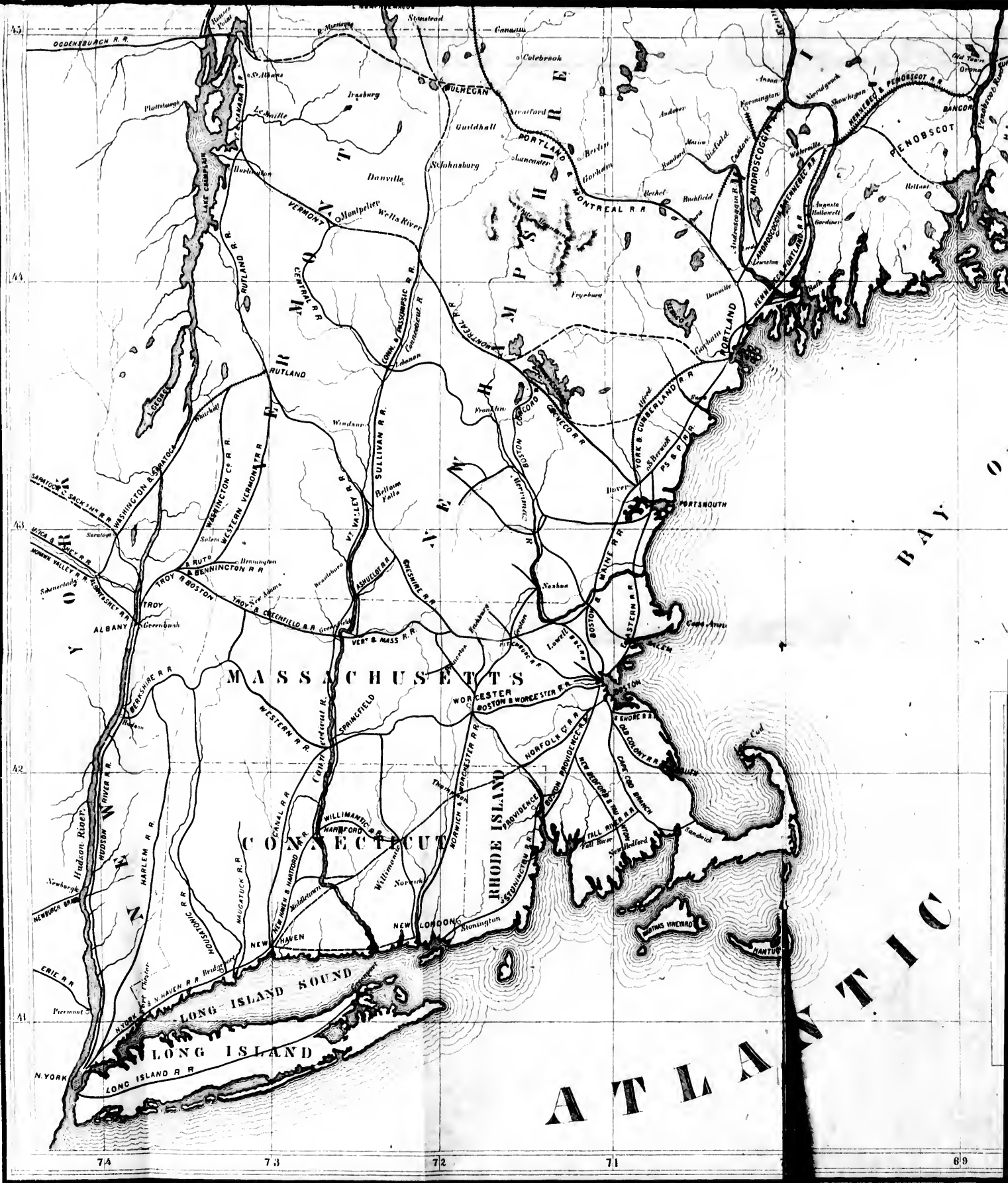
C. St. Lawrence
C. North

PRINCE EDWARD ISLAND
St. John's
Charlottetown
George's Bay
St. John's Harbour

CAPE BRETON ISLAND
Louisbourg

ST. JOHN'S STRAIT
CUMBERLAND
COLCHESTER
PICTOU
SIDNEY

GUYSBORO
GUYSBORO BAY
St. John's
St. Lawrence
St. John's
St. John's



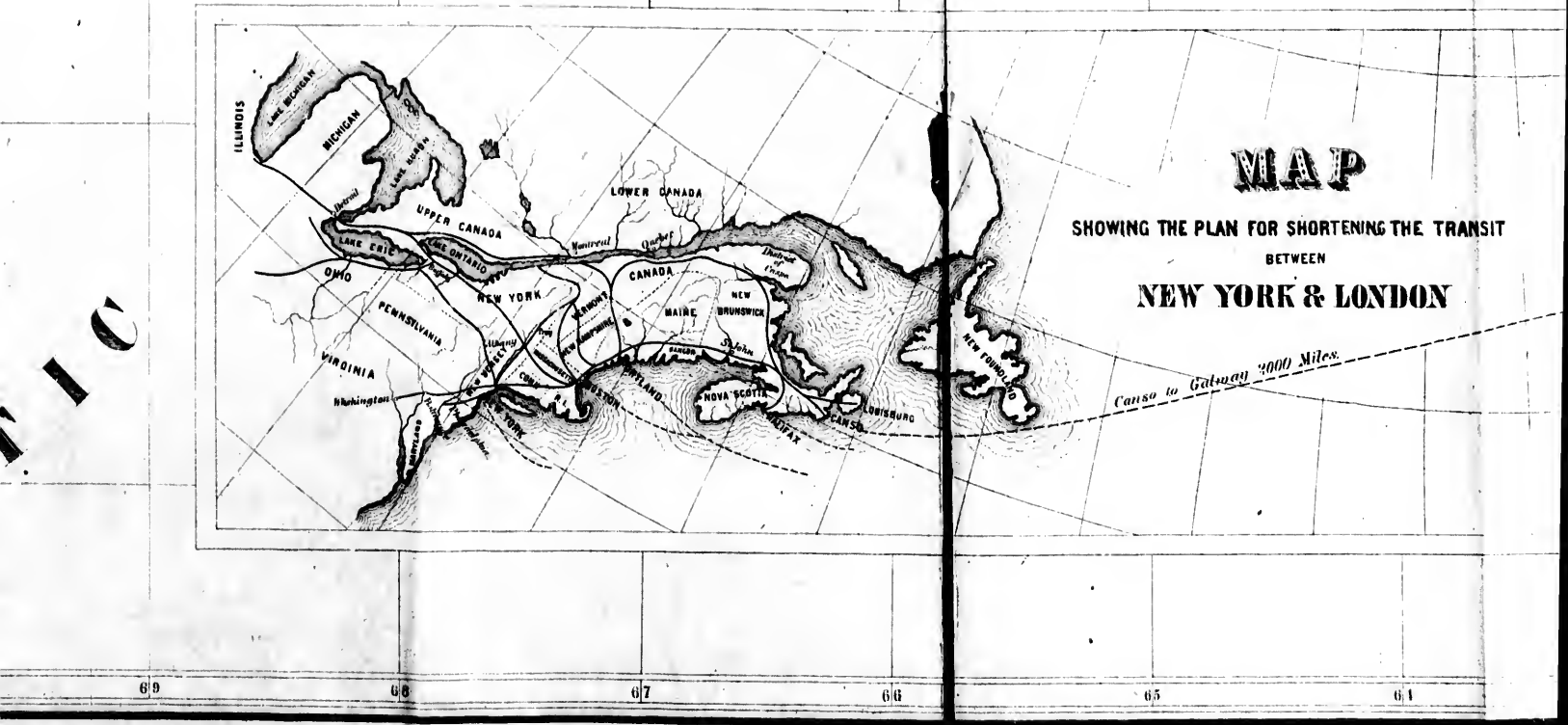
Map showing the New England region, including parts of Massachusetts, Connecticut, Rhode Island, and Long Island. Major cities and towns are labeled, along with numerous railroad lines and geographical features. The map includes a grid of latitude and longitude coordinates.



Cur

Made
Governor

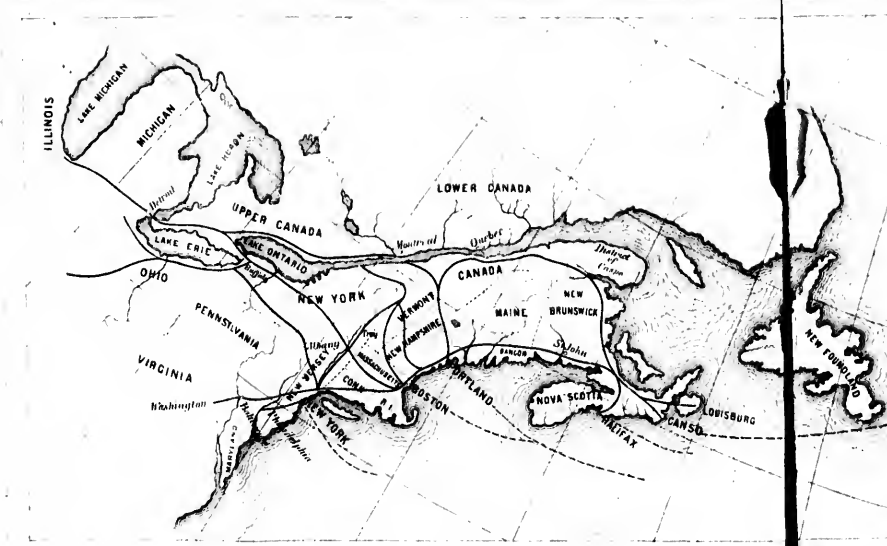
J. B. Cummings del.



MAP

SHOWING THE PLAN FOR SHORTENING THE TRANSIT
BETWEEN
NEW YORK & LONDON

Course to Gateway 3000 Miles.



MAP
 SHOWING THE PLAN FOR SHORTENING THE
 DISTANCE
 BETWEEN
NEW YORK & LONDON

Course to Glasgow 4000 Miles.



MAP

of the

European and North American

RAILWAY.

SHOWING ITS CONNECTION WITH THE RAILWAYS OF THE

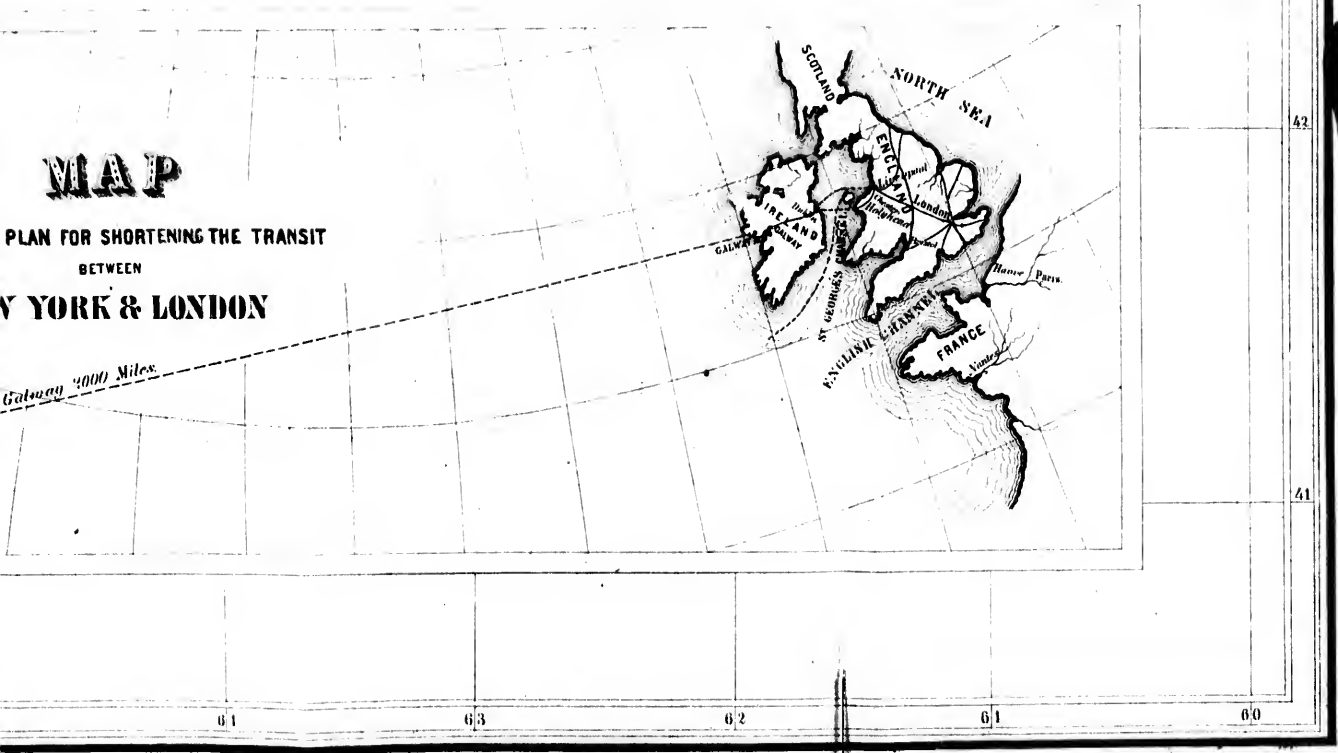
UNITED STATES & CANADA.

*Made by direction of His Excellency John Hubbard
Governor of Maine under the Resolve of Aug 20th 1850.*

A. C. Morton
Engineer

J. B. Cummings del.

B. W. Thayer & Co^s Lith Boston.



MAP

PLAN FOR SHORTENING THE TRANSIT
BETWEEN
NEW YORK & LONDON

Galway 2000 Miles

61 63 62 61 60

45
44
43
42
41

