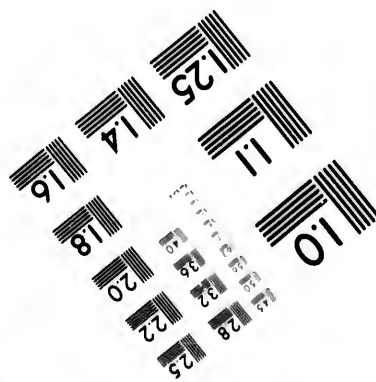
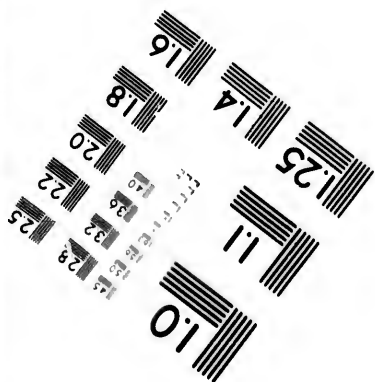
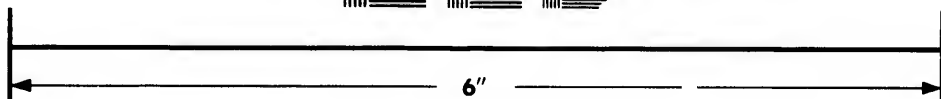
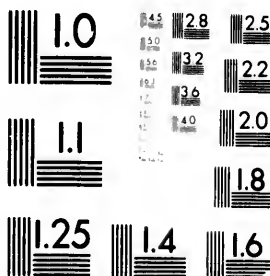


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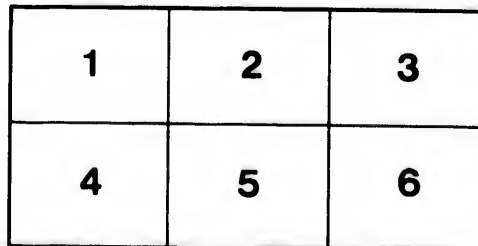
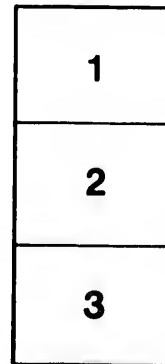
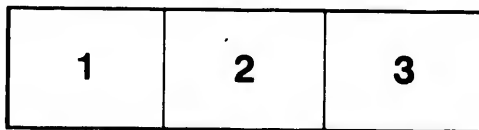
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# RAILWAY ROUTES

FROM

## MONTREAL.

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MR. BEMISTER'S

REPORTS

# ON THE SURVEYS,

MASKINONGE TO JOLIETTE.

JOLIETTE TO ST. ESPRIT AND LACHENAIE.

JOLIETTE TO THE OTTAWA RIVER.

MONTREAL TO TERREBONNE.

AND

## PROPOSED ROUTES.

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BEMISTER & SLATER, CIVIL ENGINEERS.

MONTREAL, AUGUST, 1875.

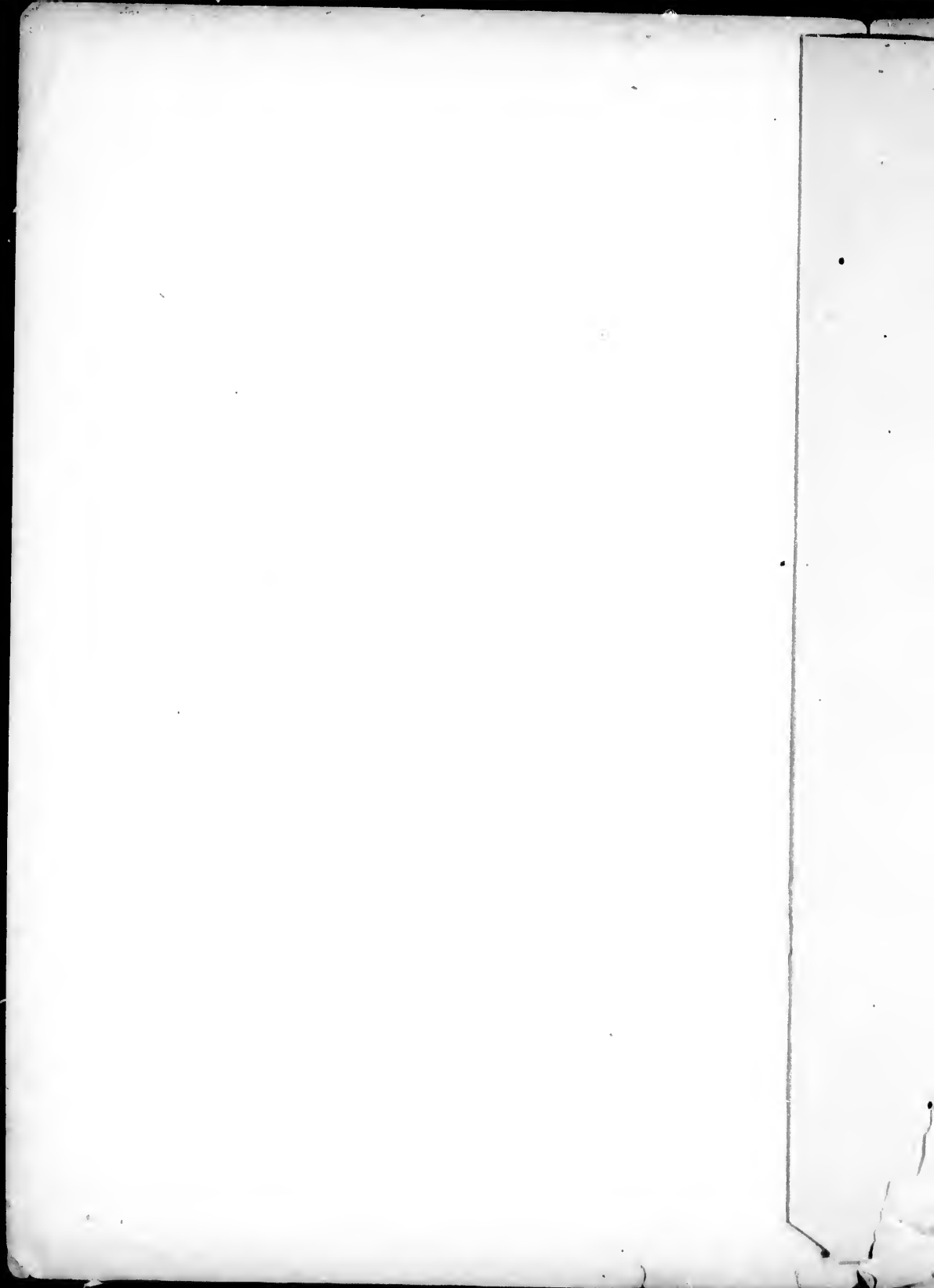
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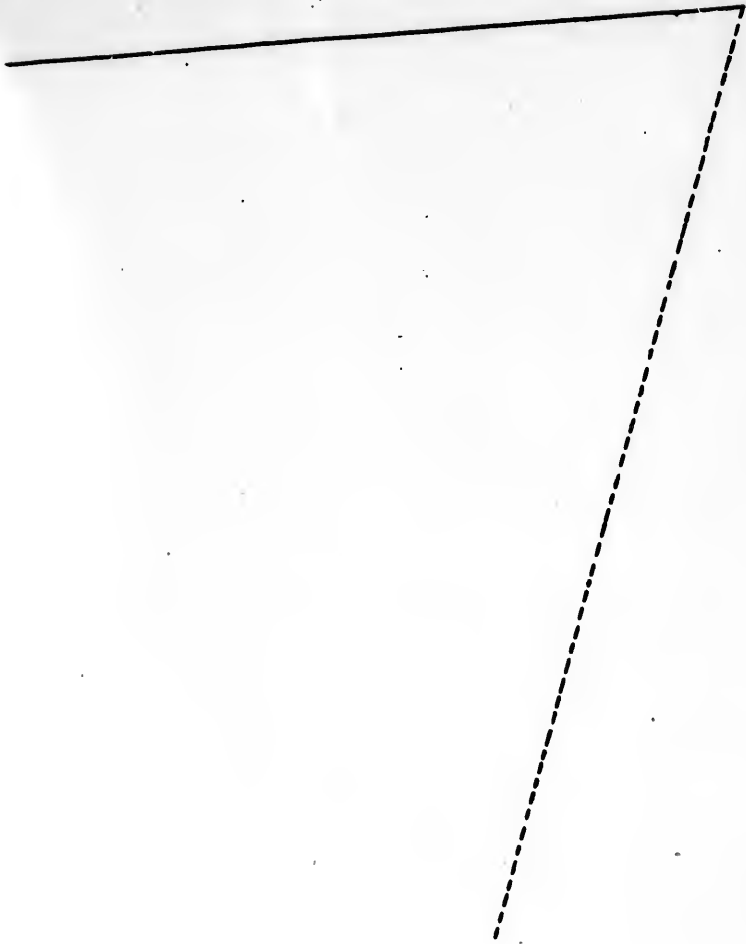
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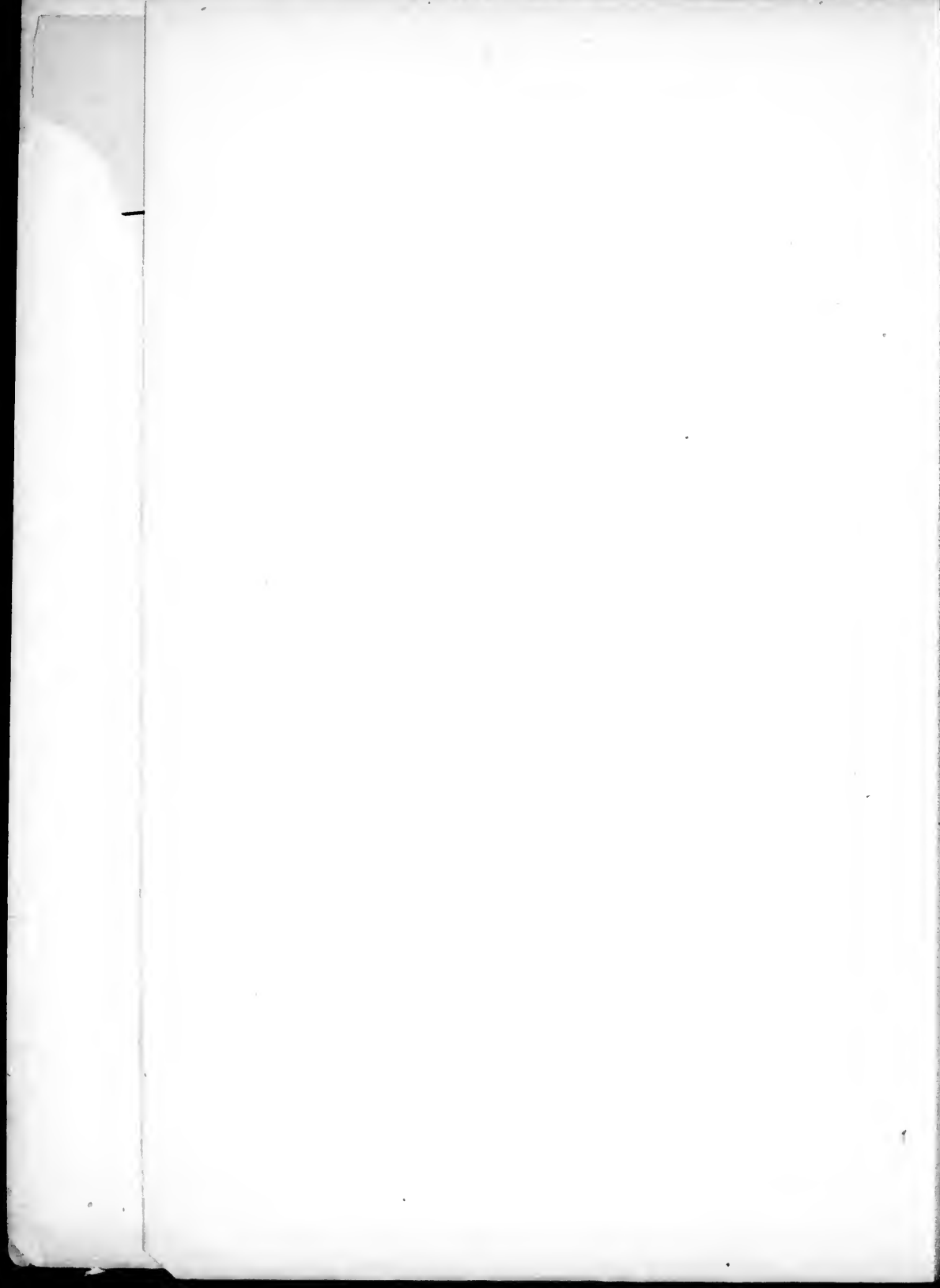


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of  
"The Canadian Illustrated News"  
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# RAILWAY ROUTES

FROM

## MONTREAL.

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AND

## PROPOSED ROUTES.

*George Bemister*

BEMISTER & SLATER, CIVIL ENGINEERS.

MONTREAL, AUGUST, 1875.

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To the MAYOR AND CORPORATION OF THE TOWN OF  
JOLIETTE.

MONTREAL, August 4th, 1875.

*Gentlemen,*

I have the honour to make you the following Report on the explorations and surveys made, according to your instructions, and at the same time to hand you a plan and profile shewing the exploration and survey made from the Town of Joliette to the crossing of the Ottawa River by the survey-line of the North Shore Railway Co., between Lachenaie and Bout-de-l'Isle.

A plan and profile have already been placed in your hands of the line, surveyed during the winter, on the route between Maskinongé and Joliette. Those and the plan and profile sent you with this Report shew a complete exploration of the country between the crossing of the Maskinongé River by the survey-line of the North Shore Railway Co. and their crossing of the Ottawa River mentioned above; taking Joliette as the object of the deviation from the route of the North Shore Co's Survey-line.

The actual surveys made by us were between the Ottawa River and Joliette, and between Joliette and St. Barthelemi, but a survey had been made by the North Shore Railway Co. between Maskinongé and a point near St. Barthelemi which has been used in making up the estimates given in the reports.

## JOLIETTE TO MASKINONGE.

Two routes were explored and surveyed, one keeping to the north of a direct line between Joliette and St. Barthelemi and shewn by a plan and profile and the other south of a direct line.

Owing to the grade of 1 in 100 (52.80 ft. per mile) required to descend "the coteau" and the curves necessary to avoid gullies, which are large near the edge of "the coteau" together with the heavier nature of the work at the crossing of the Chicot River, I have decided on adopting the route to the south of a direct line between Joliette and St. Barthelemi. Therefore the estimates are for the latter route.

By adopting this route a straight line can be located from Joliette to Maskinongé River, a distance of 24 miles, with a maximum grade of 1 in 176 (30 ft. per mile) at the rise of "the coteau" and with light work. There would be but one grade of this rate, no other being more than 1 in 200 (26 ft. per mile.)

This statement shews the very favourable character of the country.

This portion of the route I have fully described in my General Report, therefore, it is not necessary to say more in this.

## JOLIETTE TO THE OTTAWA RIVER CROSSING.

The country crossed by this route is very favourable for railway construction. "The coteau" which is so high and so abrupt at St. Barthelemi and at Mascouche is not found on this route. The slope is gradual and unbroken up to the height of Joliette, as an inspection of the profile will shew.

The line is nearly, but not quite a direct one, owing to the large swamp situated to the south of L'Épiphanie in which the ground is so bad as to make passing through it out of the question when good ground is near. The route shewn by the

red line on the plan and by a dotted black line on the map accompanying these reports has good ground throughout except that, like the ground of the North Shore Survey-line, near the Ottawa River it is liable to floods for a distance of over three miles from the river. The Lac Ouareau River is the largest on this route, requiring a bridge of two hundred feet span (or two spans of 100 feet each.) The grade is sixty-seven feet above the bottom of the river.

Except for its large cost this bridge would form no difficulty as the bottom of the river is rock and the depth of water not great. In fact, the water-way might be greatly reduced without danger although as a rule I prefer to interfere as little as possible with the natural channel, in order to avoid any damage to the bridges from floods.

Following is a statement of what would be the principal features of the railway line if this route were adopted; with an estimate of cost, and comparisons in all these particulars with the North Shore Co's Survey-line.

A Maskinongé to the Ottawa River (by way of Joliette.)

B Maskinongé to the Ottawa River (North Shore Co.'s Survey line by way of L'Assomption.)

Total length.	Straight line.		Curves.				Grades.							Total rise and fall.					
	Miles.	Per cent of whole length.	5,730 feet radius.		Level.		Up to 10 ft per mile.		11 ft. to 17 ft. per mile.		21 ft. to 26 ft. per mile.		32 ft. to 37 ft. per mile.		42 ft. per mile.				
Miles.			Miles.	Per cent of whole length.	Total deflections.	Average per mile.	Miles.	Per cent of whole length.	Miles.	Per cent of whole length.	Miles.	Per cent of whole length.	Miles.	Per cent of whole length.	Miles.	Per cent of whole length.			
A 46	43 $\frac{1}{2}$	95.51	2 $\frac{1}{2}$	4.49	109 15'	2 22'	28 $\frac{3}{4}$	62.60	2 $\frac{1}{2}$	5.31	7 $\frac{1}{2}$	15.77	4 $\frac{1}{2}$	9.32	3 $\frac{1}{2}$	7.00			
B 43	40 $\frac{5}{8}$	94.32	2 $\frac{1}{8}$	5.08	5,730 ft., 2,865 ft., 1,910 ft. rad.		19 $\frac{1}{2}$	44.98	8 $\frac{1}{2}$	19.82	7	16.08	6	13.83	1 $\frac{3}{8}$	3.97	$\frac{1}{2}$	1.32	
																			326 or 7 ft. per mile.
																			328 or 7 $\frac{1}{2}$ ft. per mile.



The table given above shewing the characteristics of the line and a similar table shewing those of the North Shore Co's Survey-line, prove that in every respect, except in that of length, it is better than the latter.

Line by way of Joliette, 46 miles in length.

North Shore Co's Survey-line, 43 " "

The difference is therefore 3 miles against the route by way of Joliette. The construction of the line is however less in cost. The estimates include for the same items given in the estimates in my general report and therefore it is not necessary to detail them here.

The total cost for the 46 miles, by way of Joliette, would be \$900,104 or \$19,566 per mile. The total cost for the 43 miles, the North Shore Co's Survey-line, would be \$972,264 or \$22,610 per mile. This shews that by adopting the longer line there would be a saving in cost of \$72,160 or over \$3,000, mile for mile. The saving would be greater but for the heavy work in the bridges and culverts (as at Lac Ouareau River.)

I do not say anything here as to the character of the country through which this route passes, or the facilities it affords for the construction of a railway line over that passed through by the North Shore Co's Survey-line, because the above statements are sufficient in themselves, and because the statements, as to these particulars, given in my general report for the route by way of Terrebonne apply, with slight modification, to this route. May I therefore refer you, for any further information to that report.

I have the honour to be,

Gentlemen,

Your obedient servant,

GEORGE BEMISTER.



TO MESSRS. N. FOREST, J. E. ECREMENT, J. E. CLOUTIER,  
C. DUPUIS, JOSEPH LEGARE, M. GRANGER, J. MAG-  
NOLL, E. POIRIER, JOSEPH MORIN, LEON PIQUETTE,  
MOISE MELANCON, LOUIS LORD and ADELMAR  
LEBIANC.

MONTREAL, August 4th, 1875.

*Gentlemen,*

Some time since I handed you a plan and profile of the survey, made according to your instructions, between Joliette, St. Jacques, St. Alexis, St. Esprit and Lachenaie promising you a report with estimates on the completion of the surveys then being carried on for the Towns of Joliette and Terrebonne. I have now the pleasure of making you the following report.

The red line on your plan and a dotted black line on the map accompanying the reports shew the route of the survey.

According to your instructions the survey-line was taken to within about a mile of St. Esprit. It is nearly a direct line between Joliette and St. Esprit. Curving at St. Esprit River the line runs direct for Lachenaie. If the route of this survey were adopted for a railway-line the following is a statement of what would be its cost and its principal features.

I also give a comparison with the North Shore Co's Survey-line.

A Joliette to Lachenaie (by way of St. Jacques, St. Alexis and St. Esprit.)

B Maskinongé to the Ottawa River (North Shore Company's Survey-Line.)

Total Length.	Straight Line.		Curves.				Grades.								Total rise and fall.		
	Miles.	Per cent. of whole length.	5,730 feet radius.		Level.		Up to 10 ft. per mile.		11 ft. to 17 ft. per mile.		21 ft. to 26 ft. per mile.		35 ft. per mile.			52.80 ft. per mile.	
			Miles.	Per cent. of whole length.	Total deflections.	Average per mile.	Miles.	Per cent. of whole length.	Miles.	Per cent. of whole length.	Miles.	Per cent. of whole length.	Miles.	Per cent. of whole length.	Miles.	Per cent. of whole length.	Feet.
A	27	94.50	1 1/4	5.50	78°30'	2.54'	16	59.48	3 3/8	13.43	4 1/2	16.75	3	2.58	1 1/2	5.07	253 or 3 1/4 ft. per mile.
B	43	94.92	2 1/2	5.08	158°34'	3.41'	19 1/2	44.98	8 1/2	19.82	6	13.83	1 3/8	3.97	1 1/2	1.32	328 or 7 1/4 ft. per mile.

The tables given above shew the following results :

This line is the superior of the North Shore Co's Survey-line in curvature not only because the degrees of deflection are less per mile, but also because the curves are not rendered necessary by the nature of the country over which the line passes (as that at St. Esprit changing the direction for Lachenaie.)

With respect to grades the difference is to some extent in favour of the North Shore Co's Survey-line owing to the grade of 1 in 100 (52.80 ft. per mile) required to descend from "the coteau" to the lower flat on the line between St. Esprit and Lachenaie.

In the rate of rise and fall the advantage is also slightly on the side of the North Shore Co's Survey-line.

The line on this route could however be constructed for less than the North Shore Co's Survey-line would cost per mile ; the difference being as follows :

North Shore Co's Survey-line . . . .	\$22,610
Line by way of St. Esprit . . . . .	\$18,824
	<hr/>
Difference per mile in favour of the latter	\$3,786

The items included in the estimates are the same as those given in my general report.

The saving on the line by St. Esprit is much reduced by the heavy work required at "the coteau," the direction in which the line is going making it necessary to cross "the coteau" nearly at right angles and at one of the steepest places as here it forms an abrupt termination of the upper flat of the country with a difference of elevation between it and the flat below of from 70 to 80 feet.

Although there is a saving in cost of construction on the 27 miles of, in round figures, \$100,000, still as this line to St. Esprit would be eight miles longer than the North Shore Co's Survey-line this saving would be more than swallowed up in the construction of the extra length.

If the saving were greater and the line had no "coteau" to cross there are two reasons, that I expressed to you at the time the survey was going on, why I could not recommend this route for adoption, these are: the lengthening of the line of the railway so much without the advantages to the Railway Company being in proportion to the increase, and the great angle or bend which the line must take to cross the Ottawa River below Lachenaie. This latter objection to the route will be understood on an inspection of the map accompanying the reports.

With these objections the adoption of this route is not possible. The survey has fully answered its purpose as an exploration of the country and I trust that you will see that the route I have recommended in my general report is the best and the one most calculated to serve the different towns and villages interested, while at the same time it is the route that will serve the interests of the Railway Company.

Allow me to refer you to my general report, therefore, for further information.

I have the honour to be,

Gentlemen,

Your obedient servant.

GEORGE BEMISTER.



TO THE MAYOR AND CORPORATION OF THE TOWN OF  
TERREBONNE.

MONTREAL, AUGUST 4th, 1875.

*Gentlemen,*

I have the honour to report to you the results of the survey made according to your instructions between Montreal and your Town, with the object in view of finding a route on which a first-class railway might be constructed.

Between the height of the land on the island of Montreal and Terrebonne, two routes were explored.—the blue line on the plan shews the base line of the exploration—one taking a direct line for Terrebonne and the other, which is the route I have adopted, crossing the river at St. Vincent. The much greater length of the bridging that would be required on the direct route and the fact that St. Vincent is of sufficient size and importance to make the deviation worth taking in the interests of the Railway, leave no doubt in my mind that it is the best.

The route shewn on the plan by the upper dotted red line between the Montreal Ottawa and Western Railway and St. Vincent was also explored, and as it would have been shorter and consequently more direct and have made the angle of deflection less for the change of direction at St. Vincent for Terrebonne, I should prefer this route but that it has the serious objection of having to cross a height of land near the junction with the Montreal Ottawa and Western Railway nearly sixty feet higher than that crossed by the route of the firm red line lower down. This prevents its adoption.

This report includes estimates for the works; statements of the principal characteristics of the line on the route that it would be best to follow and also comparisons in cost with the North Shore Company's Survey-line.

The results of the survey are very satisfactory having regard to the nature of the country, in the height of land, and the two large rivers, to be crossed and are fully up to my expectations as expressed to you before the commencement of the survey.

A railway, first-class in every respect, can be constructed and at a cost much less for the same length than what would be the cost of a line on the North Shore Company's Survey-line, crossing the Ottawa River below Lachenaie.

The following statements will however speak for themselves.

A Montreal to Terrebonne (from the Montreal, Ottawa and Western Railway at Hocmelaga, by way of St. Vincent de Paul.)

B Montreal to Terrebonne (crossing the Montreal, Ottawa and Western Railway below Papineau Road, by way of St. Vincent de Paul.)

Total Length of Line.	Straight Line.	Curves.		Grades.					Rise and Fall								
		Radius.		Level.		Up to 10 feet per mile.		11 ft. to 20 ft. per mile.		26 ft. to 29 ft. per mile.		34 ft. to 35 ft. per mile.		41 ft.		Total Rise & Fall	
Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.
		5,730 ft.	2,865 ft.														
A	13	11	$1\frac{1}{2}$	$160^{\circ}00'$	4.80	0.42	2.08	1.51	1.63	2.56	121	132	253				
B	12	11 $\frac{3}{4}$	1	133 $^{\circ}45'$	5.42	0.45	3.55	0.97	1.76	0.85	38	141	179				



The first table (A) shews the principal features of the line if the route starting from a junction with the Montreal Ottawa and Western Railway at Hochelaga, on the flat below "the Coteau," should be adopted. The advantage of this would be in avoiding the steep grades of the Montreal Ottawa and Western Railway near Hochelaga on all traffic coming from, or going to, the harbour.

The line whose principal features are given in the second table (B) which forms a junction with the Montreal Ottawa and Western Railway above Hochelaga (that is; above "the Coteau") is superior in some respects. A large proportion of the traffic of Montreal would be better served by it, especially the passenger traffic. The same length (13 miles) would take the line three-quarters of a mile nearer the centre of Montreal—in other words this line is shorter than A by three-quarters of a mile, taking Terrebonne and the centre of Montreal as the two ends of the route.

The line A for the part of it near Hochelaga is shewn on the plan by a dotted red line and on the map accompanying the reports by a dotted black line.

The line B is shewn on the plan by an unbroken red line and on the map by an unbroken black line.

With regard to cost the difference would be slightly in favour of the line B—the work required on the line A at the descent of "the Coteau" being somewhat heavy in character compared with that of other portions of the line.

The cost of construction on the line B would be \$37,268 per mile including the construction of the bridges over the Rivers des Prairies and des Mille Isles or a total cost for the thirteen miles of \$484,499.

The line A may be taken as the same in cost per mile, the difference, mile for mile, between the two lines being so small. The estimates do not include for station-buildings or telegraph

but are for the same items that are given in the estimates in my general report and are as follows ;—

- The land required.
- The clearing, slashing, or grubbing of the bush.
- The fencing (iron wire) and farm gates.
- The earthwork in cuttings and embankments, &c.
- The public road and farm crossings.
- The masonry for culverts and Bridges.
- The ties.
- The ballasting of the road with stone or gravel.
- The laying of the track, main line and sidings.
- The Iron Bridges.
- The steel rails with fastenings.
- The switches for sidings.

All these items are estimated for as being first class and equal to similar works on the best Canadian Roads.

A line constructed on the North Shore Company's Survey-line from the Ottawa River to Montreal would cost for the same items and class of work as above, \$53,233 per mile, including for the bridging of the Ottawa River or a total cost, for the distance of twelve and one third miles, of \$656,547.

Adding therefore the cost of two-thirds of a mile the saving effected by the line to Terrebonne as compared with an equal length of the North Shore Company's Survey-line is \$187,120. The principal item of this saving is in the bridging. The cost of the bridging for the two rivers on the line to Terrebonne being far less than that for the Ottawa River where it is crossed by the North Shore Company's Survey-line below Lachenaie. There is also a saving on the earthwork, on the masonry, and on the ballasting.

The bridge on the North Shore Company's Survey-line over the Ottawa River may be called in round figures 3000 feet in length. One span of it must be a "draw" or a "pivot"-

bridge. The bottom is very bad for the pier-foundations, and the bridge would be very liable to damage during floods.

The two bridges on the line to Terrebonne would not be much over 1500 feet in length. I have, however, made the bridge over the River des Mille Isles longer than actually necessary for the water-way so that the road from the present road-bridge into Terrebonne can be carried *under* one of the spans. This keeping up of the bridge in height enough to allow of the road-way being under the track will be a great advantage to Terrebonne. No "draw" or "pivot"-bridge is required on this line as the bridges are above the navigation. The bottoms of the rivers are all that could be desired for the pier-foundations, being rock, and there is no danger of damage to the bridges during floods.

These statements speak for themselves, of the great superiority in many respects of the line between Terrebonne and Montreal, and having made a general report on the route I think best adapted to meet the growing need for railway accommodation of your Town and County and the counties of L'Assomption, Montcalm, Joliette and Berthier;—to avoid needless repetition in this, may I beg your reference to that for further information.

I have the honour to be,

Gentlemen,

Your obedient servant,

GEORGE BEMISTER.



TO THE MAYORS AND CORPORATIONS OF THE TOWNS OF  
JOLIETTE AND TERREBONNE, AND TO GENTLEMEN  
OF ST. JACQUES, ST. ESPRIT, ST. ALEXIS, ST.  
ROCH, &c.

MONTREAL, 4th August, 1871.

*Gentlemen,*

Having had the pleasure of giving you special reports on the surveys carried out by us according to your instructions during the last winter between Joliette and St. Barthelemi; and Joliette, St. Jacques, St. Alexis, St. Esprit, St. Roch and Lachenaie; and more recently between Joliette and the Ottawa River; and between Montreal and Terrebonne; and these surveys having been made with the common object in view of, if possible, obtaining a route that would better serve the populations of the Counties of Terrebonne, L'Assomption, Montcalm, Joliette and Berthier, than that followed by the North Shore Company's Survey-line; I beg now to submit the following general report on a route for the railway that will, in my judgment, meet your special requirements, best serve the growing industries, of your towns and counties, be the best route for the interests of the Railway Company, while at the same time, it is the best line for construction and maintenance. Your examination of the following statements, will I think prove to you that this is a fair description of the route.

Accompanying these reports is a skeleton-map shewing the route and the counties to be served by the railway, together

with the different lines of exploration. In its adoption I have had great regard to the present and possible centres of the industries; thus it crosses the Chicot, Bayonne and Chaloupe Rivers close to the present Mills and where other mill-sites can be had. Joliette is a very important place with its population of 3,000 and its mills, foundries, brick-making and other industries. Leaving Joliette it crosses the Rivers Rouge and Lac Ouareau close to the Mills and where there is fine water-power; touching near St. Jacques and the group of villages around it (St. Alexis, St. Esprit, St. Liguori, all places with natural advantages to aid their growth) passing between St. Roch and L'Epiphanie, and through Mascouche, already large and promising places, thence to the important town of Terrebonne with its great water-power, foundry, quarries and natural chances for developement and through St. Vincent which from its fine situation on the river has also, like Terrebonne natural advantages in other respects as well as those for the developement of the industries. On this route then, as close almost as it is possible to put stations on the railway, are places every one of which can at once give traffic of the best paying kind to the railway and with almost unlimited natural resources for future growth.

I think the statements and information following in this report will shew that *one line of railway will serve your counties*, and my proposed route is based on this as being a fact. If this is conceded, it will also be granted that *it is better that one line should be well subsidised and pushed vigorously to completion than that two lines should be struggling for years in construction and afterwards be dividing the traffic which with only one line of railway would flow entirely to that.*

I consider the question of railway accommodation for this part of the country to be, in great measure a question of whether one or two lines shall be built to serve the traffic. If a line is built on the route of the North Shore Co's Survey-line

(shewn on the map) then the population of the interior must also have a line for their accommodation being, in number (shewn by the tables at the end of the report) over 89,000 as compared with 15,000. Therefore if the Government heavily subsidise a line on the route of the North Shore Co's Survey-line serving a population of 15,000 they cannot in justice refuse to do the same for a line that will serve one of 89,000.

For one railway-line to serve this portion of the country I consider it must meet the following requirements:

It must serve the through traffic between Montreal and Quebec.

It must serve the through traffic between Ottawa and Quebec including, of course, the traffic from the Pacific Railway intended for Quebec.

It must serve the local traffic by passing through the chief centres of the industries and of the populations; and this last requirement is not by any means the least that should be considered in the building of a railway-line with *the money of the Province*.

The route I propose will answer all these requirements and if, Gentlemen, your judgment agrees with mine, when you have examined the statements I shall now give you, then I submit that this route is the best for the benefit of the whole Province if adopted by the Government and the Railway Company.

I first give you the following statements as concisely as possible and shall afterwards speak of the conclusions to be drawn from them.

In the following table A, shews what would be the principal characteristics of a railway-line built on the route I propose (shewn on the map by a thick black line) and B those of the line if built on the North Shore Co's Survey-line (shewn on the map by a black line.) While C in the table shews the portion of my proposed route between Maskinongé and Terrebonne over which the Pacific and Ottawa traffic would have to pass.



The table is arranged so as to require but little explanation. The proposed route A is six and one sixth miles longer than B, In other respects the lines are nearly equal practically, except that in many respects the proposed route is the superior. Thus while on B, the rise and fall is spread over the whole length of the line in a succession of ups and downs, on the line A. the greatest elevation is at Joliette, the line being a gentle and gradual fall each way from that town, so that in this respect i may be considered as good as level because the rise and fall can be balanced in the working of the line.

A large proportion of the traffic will come to the line from Ottawa and the Pacific Railway and for this traffic as well as for all local traffic between Maskinongé and Terrebonne the proposed route, A, is superior in every respect, as C in the table will shew.

By building the short branch between Terrebonne and the Montreal, Ottawa and Western Railway as shewn by the dotted line on the map, the distance between Ottawa and Quebec will be sixteen miles less than by way of Montreal on the North Shore Co's Survey-line. Therefore in point of fact the only traffic which has to pass over the six miles additional length is the through traffic between Montreal and Quebec. The increase is so small a proportion of the whole distance, when the great benefits which will accrue to the railway company as the results of thus lengthening the line are considered, that there can scarcely be a difference of opinion on the subject.

The proposed route will be in the interests of the City of Montreal because it connects the city with a number of growing towns and villages requiring supplies and also a market for their produce. Also it is to the city's interest that the connecting loop for the Ottawa traffic should be as near the city as possible and it could not be brought nearer than by this route.

It is of great importance to the people of Montreal that they should be placed in a position to obtain supplies of timber of



all kinds as cheaply as possible, and especially supplies of *cheap fire-wood* because cheapening the cost of fuel is equivalent for the majority to lessening the taxation. The giving of the city funds to aid the building of railways is especially sound in principle when they will cheapen for the consumers, supplies which like fuel are used by the whole population or materials required for building. The lessening in cost of the materials, lessens the rents or if it does not do this in certain parts of the city, where the situation affects the rent greatly, it will enable families to obtain better accommodation for the same rent. But for a large number of the population the cost of building controls the rent, and therefore lessening the cost of building does for them in this, the same as a lessening of taxation, indeed is a larger benefit. The city's fuel and building materials will be cheapened, for at an easy distance for carriage, at Joliette and at St. Jacques, a distance of thirty milles, the route I propose taps the centre of almost unlimited supplies with a direct line for Montreal. The four wood carrying rivers of this part of the country may be considered as centring here, L'Assomption, Rouge, Lac Ouareau, and L'Achigan. So that the route I propose is one that the people of Montreal should do all they can to have carried out, even if necessary taxing themselves to aid it.

The importance of this for Montreal and for the railway interests cannot well be over estimated. It is this and the fact that the population of Montcalm County in the parishes of St. Jacques, St. Alexis, St. Esprit, St. Liguori, &c., is sufficiently large that makes it well in the interests of the railway to deviate from the straight line, which I should otherwise advise, so as to pass into the county of Montcalm which the line would not do if it were carried straight from Joliette, or at some distance below Joliette. I think the requirement that the line shall accommodate local traffic as well as through, would justify a deviation such as this. Then too, from the cost being less for

the bridging of the rivers this deviation could be built for nearly the same amount as it would cost to build the straight line. Although the people of L'Assomption are thought to be opposed to the carrying of the route further into the interior, yet, if my information is correct they are not unanimous in that, some having gone so far as to say they would give money if it would keep the line away ; while on the contrary, in Joliette for instance, the people are fully alive to the benefits of a railway, and understand the meaning of enterprise,—the prudent placing of a dollar so that it may bring others to its owner's pocket. There is evidence of this also in Montcalm, in the voting of \$100,000 to the railway. Where this spirit manifests itself the Government should, as much as possible, foster and help its healthy development.

In point of economy during construction also the proposed route is the best for the Railway Company, because by building the portion of the line between Maskinongé and Terrebonne and the short branch above spoken of, in length eight to nine miles, much less time will be occupied in construction and that portion of the line can be worked and so be bringing in revenue to the Railway Company before the heavy works in the bridging of the rivers are completed.

Economy is also secured by tapping the centre of fuel supply, as it is one of the great items of cost in working the line.

#### THE COST

of building the line on the proposed route will be \$22,142 per mile or a total of \$1,361,782 for the whole length from Matkinongé to Montreal. The cost of building the line on the route of the North Shore Co's Survey-line would be \$29,455 or a total of \$1,628,811 for the whole length from Maskinongé to Montreal. The works include are :

The land required.

The clearing, slashing, or grubbing of the bush.

The fencing (iron wire) and farm gates.

The earthwork in cuttings and embankments, &c.

The public road and farm crossings.

The masonry for culverts and bridges.

The ties.

The ballasting of the road with stone or gravel.

The laying of the track, main line and sidings.

The iron bridges.

The steel rails with fastenings.

The switches for sidings.

These estimates allow for the rail level being 3 ft., 6 inches, or 4 ft. above the surface of the ground and no cutting to be over five feet in depth or more than two or three hundred feet in length at that depth.

Therefore there will be a saving by adopting the proposed route of over \$7,000 mile for mile or a total of \$267,000 on the whole line.

This saving is due chiefly to the lessened cost for bridging, as stated in my report of the survey, Montreal to Terrebonne, to the natural drainage being much below the general level of the land, to the supplies of stone and timber, and generally to the better nature of the soil, over which the route passes, for purposes of construction.

It must be clearly understood that this estimate is not based in any way on the railway company's contract prices or specifications for works. These estimates including for items not contemplated by the company's contract, such as iron bridges, steel-rails, a greater quantity of ballasting, iron-wire fences, &c. Then too, it must be remembered that the cost of the Ottawa River bridge is here spread over fifty-five miles only, while the company's contract would spread it over the whole length of the road, which would help to make these estimates appear exaggerated against the average per mile of the contract; the saving also from this cause, would appear exaggerated although

truly placed, as a saving between Maskinongé and Montreal. No doubt if the items, or the difference in cost between them and those allowed for in the contract, of iron bridges, &c., were added to the company's contract amount they would bring it up to these estimates. As I have said the estimates are for first class work in every respect and are based on a cash value, that is, monthly payments on engineers' certificates, less a deduction of fifteen per cent until completion of the work. A cheaper line could be better constructed on the route I propose than on the company's survey-line.

The populations served by the proposed route, given in detail in tables at the end of these reports, according to the census for 1871, and without allowing for the increase since that year and leaving Montreal with its population of 107,225 cut of the account, are 103,925. These populations including that of Montreal are to be taken as completely served by the proposed route, a larger number would be served in proportion to their distance from the line. Thus a total population of 211,150 (pop. in 1871) will be for all *local and through traffic served by the line without any competition* with other roads; giving an average per mile of 3,430! This is a state of circumstances for traffic which no other Canadian road can shew. Of course the population of Montreal will in part travel by other routes but against this is to be put the number of people from Ottawa and those along the line of the Montreal, Ottawa and Western Railway whose business will take them to Quebec.

On the map, a thin line of small dots between the proposed route and the North Shore Co's Survey-line, is drawn to shew the large proportion of the above population that would be better served by the proposed route. Tables at the end give the details according to the parishes.

89,015 would be better served by the proposed route than by the route followed by the North Shore Co's Line; leaving only 14,910 to the latter line, and of course these would be as

well served by the proposed route as scattered populations can expect to be under the present system of railway construction. Then too, they have the steam-boat accommodation.

Tables at the end give statistics as to the crops and the industries of your counties taken from the census of 1871, which will give an idea of the probable traffic, and may be interesting to you as indicating the industries likely to be largely developed and to be encouraged. It is not necessary that I should make special observations in this respect.

#### THE NATURE OF THE COUNTRY

through which it is proposed to build a railway will usually favour one route, either by offering greater facilities for construction or maintenance or both. This is the case with regard to the proposed route and that by way of the Company's Survey-line. The difference, being largely in favour of the route by way of Joliette and Terrebonne. Thus fortunately the best route for the construction and maintenance of the line is exactly the same as the best route in the interests of the Company, for traffic, being the one passing through the centres of the existing industries. A favourable combination of circumstances which should be taken advantage of.

The portion of the country covered by these explorations, and to be served by the railway, is shewn in the accompanying map. It is bounded by the River St. Lawrence on the south-east, and by a range of hills, shewn on the map, at a distance of about twenty miles, on the north-west. This is divided by the bank, or formation, called "the coteau" at a distance from the river of about four miles at St. Barthelemi, and seven miles at Mascouche, as shewn on the map. It has a general elevation, above the land between it and the river, of fifty to sixty-feet. For a mile or two on either side of Joliette "the coteau" disappears and a gentle slope towards the river

takes its place. Advantage is taken of this circumstance in the proposed route. Along "the coteau" there are many gullies, of a depth nearly equal to its height, but, except at the rivers, they do not run far back into the land.

The general elevation of the land between "the coteau" and the River St. Lawrence is not many feet above the water-level of the river.

A diagram is given with the map, shewing the comparative profiles of the proposed route and that of the Company's Survey-line whereon the flood-levels are the dotted lines. For three miles of the route of the Company's Survey-line near the Ottawa River and for twelve miles near Berthier the land is underneath the flood-level. This makes the earthwork so heavy for that route, the banks being six to eight feet high and even with these in some places they would be, as shewn by the profile, under the flood level. The company's engineers have very generally described the soil on the route as "black-muck" as may be seen on their profiles. The Company's survey-line cannot be called either level or straight as will be seen by the map and the profile, on which in both the actual angles have been carefully laid down, and therefore they exactly represent the real shape.

The flood-level shewn is taken from the field books of the Company's Engineers and is that of the floods of the year 1865. There was also a flood in 1873. The broken nature of the Company's Survey-line is owing to the changes from swamp to hill over which the line could not do other than pass.

From "the coteau" back to the range of hills the land may be generally described by the common meaning of the word "level," as the profiles will shew, for miles it is unbroken except for the courses of the rivers. Isle Jesus, (Laval) on the route that the proposed line would follow requires no special description, being excellent, as the profile, "Montreal to Terrebonne" will shew, for the construction of the line.

The Island of Montreal although rising to some height, compared to the distance between the River des Prairies and the greatest height crossed by the route, presents no great difficulties, as the slope is sufficiently easy to obtain comparatively good grades. This is best shewn by the profile.

The highest land reached by the proposed route is at Joliette and in order that there may be no mistaken idea as to this I have not only given a diagram shewing the comparative profiles but it also shews the heights attained by some Canadian railways, including those of first class. My object being to shew that for the proposed route the height forms no great objection.

The Toronto, Grey & B. R.,	rises	415 feet in	4 miles.
The Montreal, Ottawa & W. R.,	"	190 "	3 $\frac{1}{4}$ "
The Northern Railway,	"	748 "	27 "
The Toronto & Nipissing R.,	"	886 "	35 "
The Grand Trunk Railway,	"	967 "	38 "
The Toronto, Grey & B. R.,	"	1204 "	43 "
The Great Western Railway,	"	753 "	44 "

These figures do not take into account the intermediate depressions of these lines.

The country I have just described is to be served by the proposed route and I need hardly urge the necessity of making the line serve the largest portion of the country possible, if only in the interests of the railway company in view of the present state of Canadian Railways and the questions raised by the recent action of *The Times* and Mr. Potter.

To take the route of the Company's Survey-line would be to placé the railway altogether on one side of the country to be served and in close competition with the steamboats. Another line would surely be built in the interior which would cut off some of the best paying traffic from the first line.

The damage done by floods, this year, to railroads, in the States and in France has been so great that I need hardly point your attention to the disadvantages of having a line subject, even in remote periods, to floods, especially for such lengths of it, as near Berthier for instance a length of twelve miles.

I am convinced from observation that too little attention is paid in Canada to the proper drainage of the road-beds and their ballasting, hence the decay of the ties is rapid, and although they are so cheap as not to form so serious an item in the expenditure for maintenance as in older countries, still the loss by a bad road-bed is in the increased wear and tear of rolling-stock and damage to rails. If this could be estimated it would be seen as a very serious item. Even with the ties alone the expense is serious enough as will be seen by the estimated annual cost for renewals alone, to the railroads of the States amounting to the large sum of over ten millions of dollars.

There has been a decrease in the annual rainfall for some years but a period of gradual or sudden increase is quite possible. The soil over which the Company's Survey-line passes, which the engineers have had so repeatedly to describe as "black muck" and "boggy ground," is of the very worst description for the construction of the banks, and if used, causes large expenses for repairs by sinking after every wet season or oftener. Then too no good ballast can be obtained in this part of the country which is a serious drawback if a first class line is to be built.

If railroads are to be built *to pay* in Canada, and such roads can be built, it must be by looking to economy in maintenance even more than to economy in construction.

The fact that the route proposed will serve such a large population—the largest on the same extent of country in the Province—ought of itself to be sufficient to decide its adoption.



The population served from Maskinongé, to the city of Montreal (not including that city, or the county of Maskinongé) 103,925 is greater by nearly 14,000 than the whole of the population served (to the same extent) by the remainder of the Company's line between Quebec and Maskinongé (including those counties but exclusive of Quebec city.)

The *Times* in a recent article on Canadian Railways asserted that if railways are provided the people would use them, it being understood to refer to the French-Canadian population, but I never met people so enthusiastic over the idea of getting a railway-line or people more kind to the Engineers who went through the country. The fact that the people individually, as well as the Corporations, subscribed to carry out the surveys is of itself sufficient proof of their very great desire to have railway accommodation, and that they feel its urgent necessity to enable them to keep pace with places, in that respect, more favoured. A county like Montcalm would hardly pass a by-law taxing themselves \$100,000 if they did not intend to make use of the accommodation when it is provided.

At the severe season when some of these surveys were carried on it would have been much harder for the surveying party if after their day's work they had been compelled to travel to some inn. But wherever they stopped work at night the people near were willing to take them into their houses and to make them as comfortable as possible. Thus often at half-an-hour's notice they had to provide for a number of men, and for the kindness and readiness with which they did this, we are very grateful. It certainly shewed that they welcomed the Engineers as friends who would be likely to bring them a good thing and one that they desired to get.

The route I have proposed after a personal exploration of the country, a careful consideration of the results of these surveys, together with a full inquiry into the present resources, population, and other circumstances affecting the question is as follows:

It leaves the North Shore Company's present survey-line at the Maskinongé River, and takes a direct line for Joliette a distance of twenty-four miles. It will be seen on the profile that ten miles of this, Maskinongé to the Chicot River, is as level as could be wished and superior to the North Shore Survey-line in not requiring such high banks and passing over better ground. It will also be seen that this location accommodates St. Barthelemi, St. Cuthbert, St. Norbert, and Berthier as equally and fairly as the line should do.

From the river Chicot, crossed with a bridge of fifty feet span, the ascent to Joliette is gradual and practically a superior line to the Company's Survey-line. It crosses the rivers Bayonne and Chaloupe with bridges of seventy feet span each. Accommodation is given by this line to the mills on those Rivers and to St. Elizabeth and St. Thomas. This portion of the route is particularly good for construction the work being very light and the materials of the best class, with stone on the spot.

The population of the fast growing Town of Joliette was according to the census of 1871, 3,047, a population nearly as large as the population of all the villages on the North Shore Company's Survey-line—Berthier town, and L'Assomption village being together only 2,643—larger if we except the town of Berthier which would be really just as well served by the route I propose as by the Company's Survey-line. Joliette has grown much more in proportion, than the places along the river St. Lawrence since the census. A large lumber interest centres here. Two foundries have been established. Brick-making is carried on. A paper-mill is being built. The houses and stores would do credit to any city. A handsome and commodious Town-hall and market-place has been recently built, situated in a fine square surrounded by good stores. It has two banks. Waterworks are to be carried out at once for the supply of the Town. In energy, industry, and enterprise the people are thus shewn to be setting an

example which the places around will not be slow to follow and only a railway is required to develop this to the fullest extent.

Leaving Joliette the line is straight for another eight miles of its length crossing the river Rouge with a bridge of fifty feet span and the Lac Ouareau with one of one hundred feet span ; reaching a point a mile and a half from St. Jacques : thus giving accommodation to mills on these rivers and to St. Jacques, St. Alexis, St. Esprit, St. Liguori, &c., all places that the enterprise of the inhabitants will make into flourishing towns as soon as a railway gives them a chance of outlet for their industries. For this distance of eight miles the land is fairly level and all that can be desired for construction.

At this point or thirty two miles from Maskinongé, the line takes a bend and runs straight for a distance of six miles crossing L'Achigan river mid-way between St. Roch and L'Épiphanie, just over two miles from each place. For this distance the ground is as between Joliette and Maskinongé.

Here, at a distance of thirty eight miles from Maskinongé, the line again bends to a direct line for Mascouche, seven miles distant. On this portion the ground falls in a similar manner to what the profile of the Survey from the Ottawa River to Joliette shews.

From this part of the route to Terrebonne no survey has been made, on the line, but having made a personal exploration of it I have no doubt of its nature, and the Corporation of Terrebonne are ready to have a Survey made when required.

Here at Mascouche nearly forty-five miles from Maskinongé the line bends in the direction of Terrebonne four to five miles further off, the ground between being fairly flat and the difference in elevation of the two places but a few feet.

The Town of Terrebonne has been spoken of in another part of this report, it is forty-nine and one half miles from Maskinongé and from this the route crosses the River des Mille Isles by an iron bridge of five spans of one hundred and fifty feet each or a

total length of bridge of about seven hundred and fifty feet; this bridge being a "through" bridge about twenty-two feet above the surface of the water. This will allow the public road to be carried under the end span—instead of crossing over the track. The bridge is on a level of half a mile in length. For some reasons I should prefer a crossing of the river below the road bridge, for one thing, it would lessen the angle of the line here, but it is possible the Government would require a draw-bridge and if so the crossing above the road-bridge is best, this is however a matter of detail for consideration if the route should be adopted. Thence the route continues over the rise of Ile Jesus (Laval) in the direction of St. Vincent de Paul a distance of nearly five and a half miles. This rise is not objectionable being only about forty-eight feet above the level of the bridge at Terrebonne and only thirty-three feet above the level of the bridge at St. Vincent. This portion of the line curves at about one and a half mile from Terrebonne to avoid an out-crop of rock and the stone-quarry near.

From St. Vincent fifty-five miles from Maskinongé direction is taken for Montreal, crossing the river at St. Vincent by an iron "deck" bridge of six spans of one-hundred and fifty feet each or a total length of bridging of about nine hundred feet. This bridge is on a level extending nearly a mile. It may be built so as to take the carriage and foot traffic also, but at an increase on the cost. This would be an advantage to Terrebonne and St. Vincent not to be overlooked.

Here the first rise over the Island of Montreal is taken by a grade of 1 in 125 (one foot rise for one hundred and twenty-five feet of length) reaching another level of about a mile in length.

Then a rise by a grade of 1 in 155 takes the line to a level which is the height of land to be passed over on the Island, the line being curved at this level to avoid the higher land which would otherwise have to be crossed to reach and make a junction with the Montreal, Ottawa & W. Railway.

From this junction the traffic may either pass into Montreal by way of Hochelaga, over the Montreal, Ottawa and Western Railway line, or the line may be continued beyond Papineau road, where the placing of a station would accommodate much of the passenger traffic coming to, or going from, Montreal and also a portion of the freight traffic.

I have endeavoured to put this report in such a shape that any one knowing nothing of the Engineering questions may with the help of the map understand it.

In bringing my report to a conclusion I must express my thanks to Col. Rhodes, the President of the North Shore Railway Company for the very kind manner in which he has had all the information possessed by the Company, that was likely to aid me, placed at my disposal, also to A. H. Verret, Esq., the Secretary of the Company, and to the Company's Engineers, all having most kindly done their best to help me.

Trusting your exertions, with ours, may have the best reward, they can meet with, in the shape of a railroad running through your Towns and Villages,

I have the honour to be,

Gentlemen,

Your obedient servant,

GEORGE BEMISTER.



## CONCLUDING REMARKS.

Some of the points raised during our recent interviews with the Hon. Mr. DeBoucherville and his honourable colleagues, and with Col. Rhodes and the Board of Directors of the North Shore Railway Company, not being perhaps sufficiently, explained in the foregoing portion of the report I beg to notice them here as follows :

Hon. Mr. Garneau suggested that my proposed line might be straightened, between Joliette and L'Achigan river, instead of deviating to touch near St. Jacques. This deviation lengthens the line about three-quarters of a mile, and as it requires this to pass into Montcalm County I think, as I have stated elsewhere in the report, that the population and interests of this county are great enough to be fairly considered to this extent. The exact points however to be touched are matters of detail and do not effect the general route, my object in laying it down having been to shew that the interests of the majority of the population of all the counties could be fully met and satisfied, without the increase in length being greater than the additional benefits to the Railway would more than fully cover. Mr. Garneau also suggested that the crossing of the river at Terrebonne might be lower down than shewn on the map. I adopted the crossing above the road-bridge to avoid the necessity of a draw-bridge, as stated in another part of the report. If the river could be crossed lower down with the sanction of the Government, and without requiring a draw-bridge, it would in many respects be better.

Col. Rhodes asked: How my proposed route would compare with that of the Company's Survey-line in point of time in running, I may repeat my answer here; although six miles longer it could be run in less time. No draw-bridges are required on my route while two are required on that of the Company's Survey-line. The spans of the bridges would be less than required for the Ottawa River and therefore they could be crossed with greater speed than would be allowed on bridges of larger span.

If carrying out the work I should probably use one hundred feet spans, instead of the one hundred and fifty feet ones spoken of in the report. Greater speed could be used in crossing and with such long bridges this is to be considered.

The curves, on the Company's Survey-line, average three and a half miles apart, while on the proposed route, twenty-four miles from Maskinongé is straight, and for the remainder of the line to Montreal, the curves average only about five and a half miles apart.

It will be evident that the fifteen or twenty minutes required in running the extra six miles would be more than balanced by the time required, on the Company's Survey-line, to pass the two draw-bridges and in crossing the extra length of, in round figures, 1,000 feet of iron bridging.

Hon. Mr. Robertson's question, as to the length of this route compared with that of the Grand Trunk, is more fully answered by statements given, further on, with my remarks on the western connections.

Quebec to Montreal by the proposed route is 164; by Grand Trunk 172 miles. Therefore there is a difference in favour of the proposed route, on actual length of line, of eight miles. It also saves the time taken up by the Ferry passage to Point Levis, and the crossing of the Victoria Bridge.

Hon. Mr. Chauveau, one of the directors of the North Shore Railway asked: At what time of the year the Surveys were

carried on. The Surveys were made during the months of February, March, April, May and June.

Ald. Dinning, director of the North Shore Railway asked : If there was any reason why the people near Berthier should have the distance to the railway increased, in order that the people of the interior should have theirs lessened ; or, Why should not the people of the interior come down to the Company's Survey-line, instead of the line being carried nearer to them. I think this question can be best answered by putting another beside it. Is there any reason why *some thousands* of people should have their distance to the railway increased, from ten to fourteen, sixteen, or eighteen miles, in order that *some hundreds* should have the line close to their doors ? I think in this, as in politics, the majority must be considered, and the good of the greater number be the rule. As I have shewn elsewhere, by the carrying of the line into the interior 89,000 people very greatly benefit, while but a very slight damage is done to the interests of 15,000. The 15,000 can shew no reason why they should be so greatly considered over the 89,000 ; it is true they have been told for a year or two that the line would be somewhere near the route of the Company's Survey-line, and therefore taking it elsewhere may be a damage to their interests ; but the line can only be built with the money of the Province, and this fact must induce the Government to seek, to benefit the greatest number possible.

The line should not be located with any idea of serving the South Shore of the St. Lawrence, for these reasons : Sorel is the only place of any size that could be served by this line, for the other places may be taken as better served by the Grand Trunk. To locate the line so as to best serve Sorel would not be wise, if it made any deviation necessary from the best route for places on the North Shore, because Sorel must in a few years have a connection, of its own, with the Grand Trunk, and then, even if their distance by rail should be greater than that



by way of the North Shore line to Montreal, still the ferry over the St. Lawrence would more than balance the difference.

I had written of this in my report but took it out considering that even to suggest the idea of serving a part of the South Shore was unwise. The South Shore has its line in the Grand Trunk. The North Shore requires a line, and that line should be located with the object of best serving the North Shore country and population.

To attempt to serve the South Shore, is to justify the charge made by the *Times*, that the North Shore line is merely built to compete with the Grand Trunk. It may compete for the through traffic, but that it is a competitor, in the strict sense of the word, I altogether deny. The North Shore line is a necessity for the North Shore country; the statistics I have given as to the population, etc., will prove this; it is necessary to serve the local population and traffic, which the Grand Trunk cannot do any more than a line a hundred miles further off.

In answer to Mr. Dinning's other questions I may say, as I have explained in the report, that the estimates are not based, in anyway, on the Company's Contract. The object of the estimates was a comparison between the Company's Survey-line and my proposed route through the interior; this could only be properly made by estimating for both on the same basis. I may say here, to prevent any misconception, that it is quite possible the land for the railway will cost more than the sum included in my estimate for it, because speculators may get hold of the land, and run the price up, out of all proportion to its real or present value; I am told they have already done this on the route of the Company's Survey-line: this would, however, make the saving greater on the interior line.

Other questions may arise hereafter, and any such I shall be happy to answer, wishing as I do, to place the subject in the clearest light before those who will have to decide on the route for the railway.

Since the writing of the foregoing report, the North Shore Railway has virtually passed into the hands of the Government, and questions of route, and junction with the Montreal, Ottawa and Western Railway, being thus placed in the best position for reconsideration, by the Government, and by Parliament, I here refer briefly to points which I had intended dealing with in a separate report, as being beyond the scope of the powers at present possessed by the Company.

To explain the position of the western connections with the projected route, and to give a clear idea of the considerations that have influenced me in proposing it, I have added a map shewing Canada and the States, with the existing and proposed lines that would come into communication with it; also a map of the Island of Montreal, and Laval, to shew its connections with the Montreal, Ottawa and Western, and Grand Trunk Railways.

The route proposed in the report, between Maskinongé and Montreal, is complete in itself, and the proposed branch to connect with the Montreal, Ottawa and Western Railway, between Terrebonne and Ste. Thérèse, also completes the route for the traffic between Ottawa and Quebec, but the great object I had in view, in taking the crossing of the river at Terrebonne, was to make connection with the existing railway system of Western Canada and the States, by the most direct route that the nature of the country, and existing railways would allow.

It will be seen by looking at the maps that Terrebonne is on the direct line for junction with the Grand Trunk Railway (near Pointe Claire) where, after leaving Montreal, it takes its direction for the West.

Joining with the Grand Trunk as shewn would complete the North Shore line, and give it all the necessary and possible connections at the present time.

There would be :—

## CONNECTION WITH MONTREAL.

Connection with the Montreal, Ottawa and Western Railway, and with the Montreal and City of Ottawa Railway, thus connecting with Ottawa and the Pacific Railway, and the traffic from the North and South Shores of the Ottawa River.

Connection with the Grand Trunk Railway, and with the Victoria Bridge, and the proposed bridge over the St. Lawrence at Coteau, thus connecting with the whole of the existing railway system of Canada and the States.

The making of these connections, on the shortest route required for each, would necessitate the building of three branches near Montreal.

The line into Montreal.

The line between St. Vincent and Pointe Claire, to connect with the Grand Trunk.

The line between Terrebonne and Ste. Thérèse, to connect with the Montreal, Ottawa and Western Railway.

In order to avoid at the present time, the expenditure necessary for two of the branches, the middle one might be built, that is, the one shewn on the map of the Island of Montreal between Terrebonne, the crossing by the Montreal, Ottawa and Western Railway of the River des Prairies, and the junction with the Grand Trunk near Pointe Claire. This would increase the distance between Quebec and Ottawa, and between Quebec and Montreal, but it would be the best compromise.

Following are the distances if all the three branches are built :

## Distance : QUEBEC TO OTTAWA.

- 1.) Ferry to Pointe Levis, thence Grand Trunk to Montreal ;  
 Montreal to Prescott by Grand Trunk ; thence by St.  
 Lawrence and Ottawa Railway . . . . . 338 miles.

- (2.) Ferry to Pointe Levis, thence Grand Trunk to Montreal ;  
Montreal to Coteau, thence by Montreal and City of  
Ottawa Railway . . . . . 325½ miles.
- (3.) By proposed route to Terrebonne and Ste. Thérèse, thence  
by Montreal, Ottawa & Western Railway. 260½ miles.
- (4.) By proposed route to Terrebonne and to junction with  
Grand Trunk near Pointe Claire, thence to Coteau and  
by the Montreal & City of Ottawa Railway 311½ miles.

Distance : QUEBEC TO PROPOSED JUNCTION WITH THE  
GRAND TRUNK NEAR POINTE CLAIRE.

- (1.) By Ferry to Pointe Levis, thence by Grand Trunk to  
Montreal, and from Montreal by Grand Trunk to near  
Pointe Claire . . . . . 184½ miles.
- (2.) By proposed route to Terrebonne and to junction with  
Grand Trunk near Pointe Claire . . . . . 170½ miles.

Distance : QUEBEC TO MONTREAL.

- (1.) Ferry to Pointe Levis, thence by Grand Trunk to Mont-  
real . . . . . 172 miles.
- (2.) By proposed route to Terrebonne and Montreal 164 miles.

The above are the distances by rail, so that there is not only the saving in actual rail distance in all cases, over the Grand Trunk, but also the Ferry at Quebec and the crossing of the Victoria Bridge near Montreal ; therefore a great saving in time would be effected.

If, for the present, only the middle line is built, of the three shewn on the map of the Island of Montreal, the distance will be as follows :

Distances, to the junction with the Grand Trunk, and to Ottawa by the Montreal and City of Ottawa Railway, and to places on the Grand Trunk, will be the same as given above.

## Distance: QUEBEC TO OTTAWA.

By proposed route to Terrebonne, and to junction with the Montreal, Ottawa and Western Railway, near River des Prairies, thence by the Montreal, Ottawa and Western Railway. . . . . 268½ miles.

## Distance: QUEBEC TO MONTREAL.

By proposed route to Terrebonne and to junction with the Montreal, Ottawa and Western Railway, near River des Prairies, thence by the Montreal, Ottawa and Western Railway. . . . . 171½ miles.

I need not urge the necessity of connecting with the existing railway system. It is absolutely necessary, and any connection that can be made in the City of Montreal, between the West and the East, would be altogether inadequate for the traffic.

The maps explain themselves sufficiently and the routes shewn on them are the best that could be adopted. By them the traffic from or to Ottawa, and the Pacific Railway, and the traffic from or to the West, will be accommodated without any heavy expenditure. All steep grades are avoided, for the height of land on the Island of Montreal is not crossed by these routes. Connection is made with the Victoria, the only bridge over the St. Lawrence. The difficulty of making connections in Montreal for the through traffic is got over. Pullman and mail cars can be run, without detention, from Toronto to Quebec, and from Ottawa to Quebec. This will be a great benefit to the whole Dominion of Canada, if only in view of the great importance of the ocean mail and passenger service. Connecting thus with the whole railway system of Canada and the States the North Shore Railway is raised at once from the position of a mere provincial line to that of one of the first and most important undertakings of the Dominion.

Of course the details and exact positions of the junctions with the Montreal, Ottawa and Western, and Grand Trunk Railways, on Laval and the Island of Montreal, would have to be fixed by Surveys, and the routes shewn are only to be taken as indicating the probable positions.

If these routes are followed a much greater number of people will be accommodated than are included for in my statement of the population. The bringing of the large ocean vessels laden to, or taking them from, Montreal, by the deepening of the St. Lawrence Channel, will take trade from Quebec, and she must balance it by doing all that can be done to protect and aid her interests.

With direct railway communication between the city and other parts of Canada, and the States, and Winter Navigation of the St. Lawrence if such proves possible,—of which I have strong hopes,—a great future is before Quebec, and one which her present enlightened railway policy will do much to secure to her.



**TABLE No. 1.**

The Counties, Parishes and Towns better served by Proposed Route and their populations—  
with crop statistics.

Name of County and Parish.	Acres.	Popula- tion.	Buildings and Houses.	Grain.		Potatoes and Root Crops.		Hay.	
				Acres.	Bushels.	Acres.	Bushels.	Acres.	Tons.
<b>Berthier.</b>									
a. Berthier.....	7,553	1,122	179	298	58,799	174	30,969	1,167	3,160
b. <b>Léval.</b>	200,444	2,500	944	400	104,000	1,000	25,410	1,570	2,042
c. Ste. Dorothee.....	5,160	989	171	207	24,086	332	43,663	579	580
d. Ste. Rose.....	14,742	1,816	282	485	74,355	473	75,000	1,419	1,769
e. Ste. Rose Village.....		736	133	83	10,504	129	21,268	230	300
f. St. Martin.....	14,660	2,747	459	432	60,200	663	111,286	1,967	2,108
g. St. Vincent.....	11,060	2,320	390	400	70,716	395	68,704	1,898	2,154
f. St. Francois.....	8,580	864	137	288	41,767	148	21,852	1,339	1,572
<b>Hochelaga.</b>									
a. St. Jean Baptiste.....		4,408	772	19	2,526	37	18,671	59	51
d. Côteau St. Louis.....	7,200	2,215	319	26	7,016	175	55,408	218	553
e. Hochelaga.....		530	76	25	3,110	42	5,750	163	277
f. Longue Pointe.....	3,438	505	84	44	16,526	130	20,528	1,019	1,159
g. Rivière des Prairies.....	2,900	389	68	126	17,090	132	14,870	508	762
i. Sault-au-Récollet.....		2,406	338	319	57,875	939	143,551	1,422	1,430
j. Côte de la Visitation.....	10,062	460	68	30	13,514	379	88,608	530	735
	826,420	89,015	14,047	18,499	2,451,094	12,997	1,938,102	75,813	87,854

NOTE.—The letters a, b, c, &c., are for reference to the Map.

Statistics (Census of 1871) to accompany reports.

BEMISTER & SLATER,  
Civil Engineers.

MONTREAL, August 4th, 1875.

TABLE No. 1.

The Counties, Parishes and Towns better served by Proposed Route and their populations—  
with crop statistics.

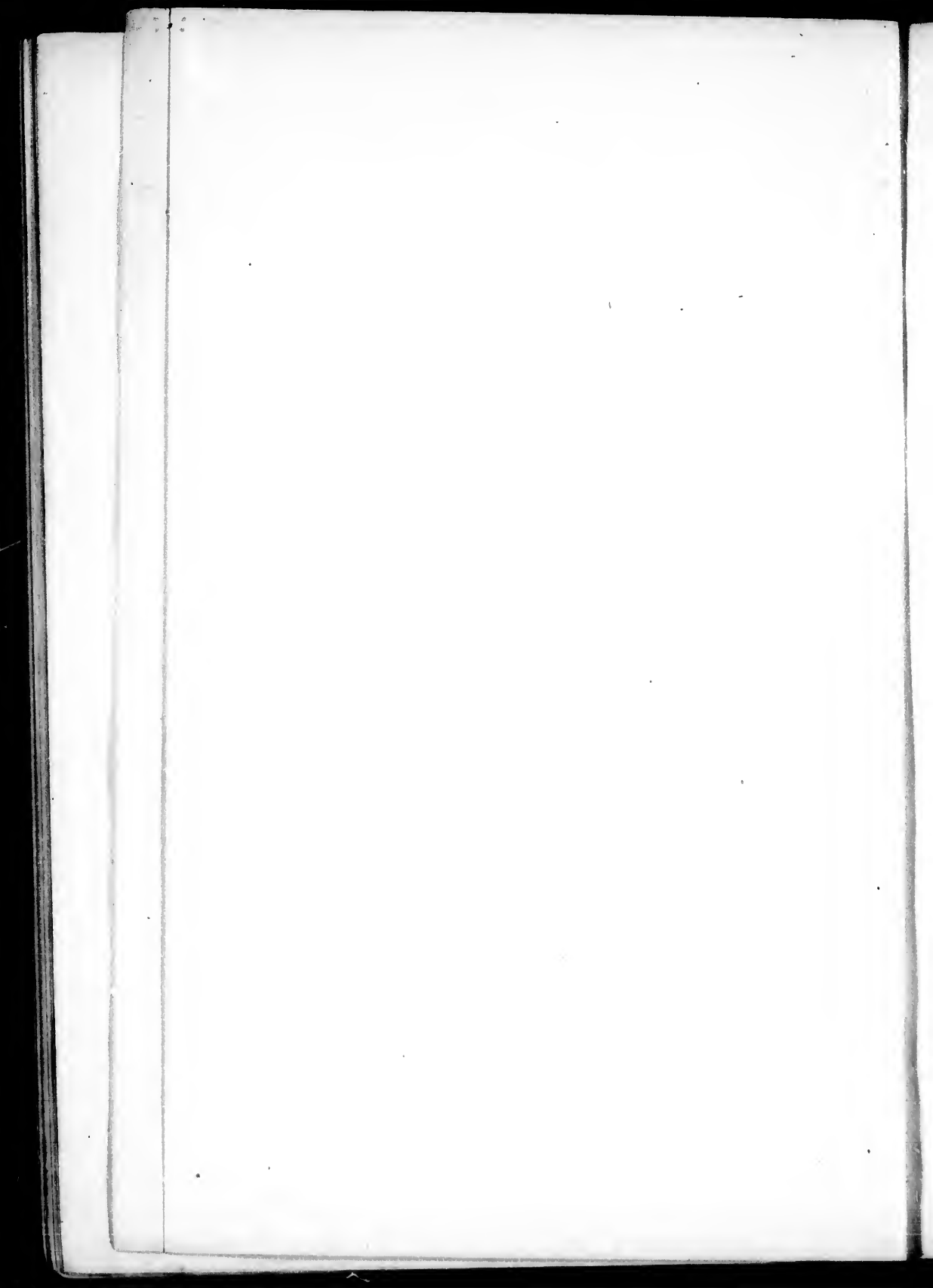
Name of County and Parish.	Acres.	Popula- tion.	Buildings and Houses.	Grain.		Potatoes and Root Crops.		Hay.		
				Acres.	Bushels.	Acres.	Bushels.	Acres.	Tons.	
<b>Berthier.</b>										
4c. Berthier.....	7,553	1,122	179	298	58,799	174	30,969	1,167	3,160	
f. St. Barthélemy.....	23,440	2,509	369	689	104,960	163	25,418	1,879	3,948	
g. St. Cuthbert.....	24,280	3,122	454	759	113,052	304	33,023	2,508	4,743	
h. St. Norbert.....	37,840	1,943	296	369	84,201	238	27,213	1,340	2,318	
i. St. Gabriel.....	73,760	2,099	298	418	51,058	238	26,509	1,791	1,663	
<b>Joliette.</b>										
a. St. Paul.....	25,125	1,943	262	499	69,029	223	35,158	1,665	2,017	
b. St. Charles Borromée.....		1,202	144	194	27,199	157	17,887	874	913	
c. Joliette Town.....		3,047	396	32	7,354	121	12,616	283	377	
d. St. Ambroise.....		30,750	1,868	358	496	54,672	187	19,070	2,058	1,778
e. St. Alphonse.....		23,562	1,266	206	92	29,052	234	27,506	2,542	1,422
g. St. Thomas.....		9,750	1,843	334	475	49,394	191	21,108	1,414	1,562
h. Ste. Elizabeth.....		50,125	2,753	375	821	84,580	169	29,329	2,609	2,822
i. St. Félix de Valois.....			3,196	439	491	73,725	310	39,754	1,839	2,023
j. Ste. Mélanie.....		17,687	1,548	232	310	34,449	198	26,306	1,472	1,495
k. St. Jean.....		28,812	2,293	322	237	48,573	243	31,479	1,994	1,923
l. Ste. Beatrix.....	21,625	927	110	93	22,185	121	13,357	970	782	
<b>Montcalm.</b>										
a. St. Jacques.....	19,160	2,754	465	821	83,603	405	50,464	2,669	3,271	
b. St. Liguori.....	6,102	1,485	223	369	64,768	204	27,051	1,419	1,617	
c. St. Alexis.....	7,180	1,360	212	710	53,261	149	18,187	1,335	1,593	
d. St. Esprit.....	18,790	1,537	273	882	51,966	166	20,803	1,935	1,764	
e. Ste. Julienne.....	11,980	1,117	180	225	15,348	219	16,652	1,285	936	
f. St. Patrick.....	22,630	786	122	133	19,380	160	17,138	1,759	1,188	
<b>L'Assomption.</b>										
4a. St. Charles.....	4,450	426	68	138	6,765	79	4,067	424	473	
b. St. Henri.....	36,700	2,435	411	558	75,366	390	56,612	2,047	2,491	
c. St. Lin.....	41,100	2,697	453	642	75,651	296	50,394	3,266	2,975	
d. St. Roch.....	22,254	2,523	382	1,085	92,936	217	34,133	1,606	2,041	
j. L'Epiphanie.....	12,610	1,365	254	355	51,597	257	23,227	1,418	1,504	
<b>Terrebonne.</b>										
a. Terrebonne Town.....	278	1,050	189	10	3,507	28	5,586	155	373	
b. Terrebonne.....	21,180	836	131	305	37,576	183	31,277	1,298	1,702	
c. Ste. Thérèse.....	16,916	1,768	288	596	75,160	452	78,179	2,043	2,222	
d. Ste. Thérèse Village.....	134	914	180	61	7,081	78	15,930	215	255	
e. St. Janvier.....	11,666	1,300	222	385	40,009	219	31,445	1,497	1,397	
f. Ste. Anne.....	24,611	1,821	282	298	59,092	263	28,779	2,965	2,615	
g. Ste. Sophie.....	25,501	1,311	230	84	34,932	253	43,610	1,431	1,644	
h. New Glasgow.....		168	26	5	2,475	15	3,483	118	118	
i. St. Jérôme.....	31,940	2,480	391	591	72,051	514	76,328	2,963	2,990	
j. St. Jérôme Village.....	237	1,159	202	98	13,428	87	17,560	512	521	
<b>Two Mountains.</b>										
d. St. Eustache.....	16,996	1,987	330	710	77,522	559	85,655	2,403	2,959	
e. St. Eustache Village.....	254	858	139	56	7,348	63	13,499	356	514	
f. St. Augustin.....	19,000	1,812	323	805	118,705	496	82,172	2,938	5,075	
<b>Laval.</b>										
a. Ste. Dorothee.....	5,160	989	171	207	24,086	332	43,663	579	580	
b. Ste. Rose.....	14,742	1,816	282	485	74,355	473	75,000	1,419	1,769	
c. Ste. Rose Village.....		736	133	83	10,504	129	21,268	230	300	
d. St. Martin.....	14,660	2,747	459	632	60,200	663	111,236	1,967	2,108	
e. St. Vincent.....	11,060	2,329	390	400	70,716	395	68,704	1,898	2,154	
f. St. François.....	8,580	864	137	288	41,767	148	21,852	1,339	1,572	
<b>Hochelaga.</b>										
e. St. Jean Baptiste.....	7,200	4,408	772	19	2,526	37	18,671	59	51	
d. Côteau St. Louis.....		2,215	319	26	26	7,016	175	55,408	218	533
4c. Hochelaga.....	2,640	530	76	25	3,110	42	5,750	163	277	
4f. Longue Pointe.....	3,438	505	84	41	16,526	130	20,528	1,919	1,159	
4h. Rivière des Prairies.....	2,900	389	68	129	17,090	132	14,870	506	792	
i. Saunt-au-Récollet.....	10,062	2,406	338	319	57,875	939	143,551	1,422	1,430	
j. Côte de la Visitation.....		460	68	30	13,514	379	88,608	530	735	
	826,420	89,015	14,047	18,499	2,451,094	12,997	1,938,102	75,813	87,854	

NOTE.—The letters a, b, c, &c., are for reference to the Map.

Statistics (Census of 1871) to accompany reports.

BEMISTER & SLATER.





**TABLE No. 2.**

The Parishes on the route of the North Shore Company's Survey-line—their populations and Crop Statistics, &c., for comparison with the Counties, Parishes, &c., better served by the proposed route as shewn by table No. 1.

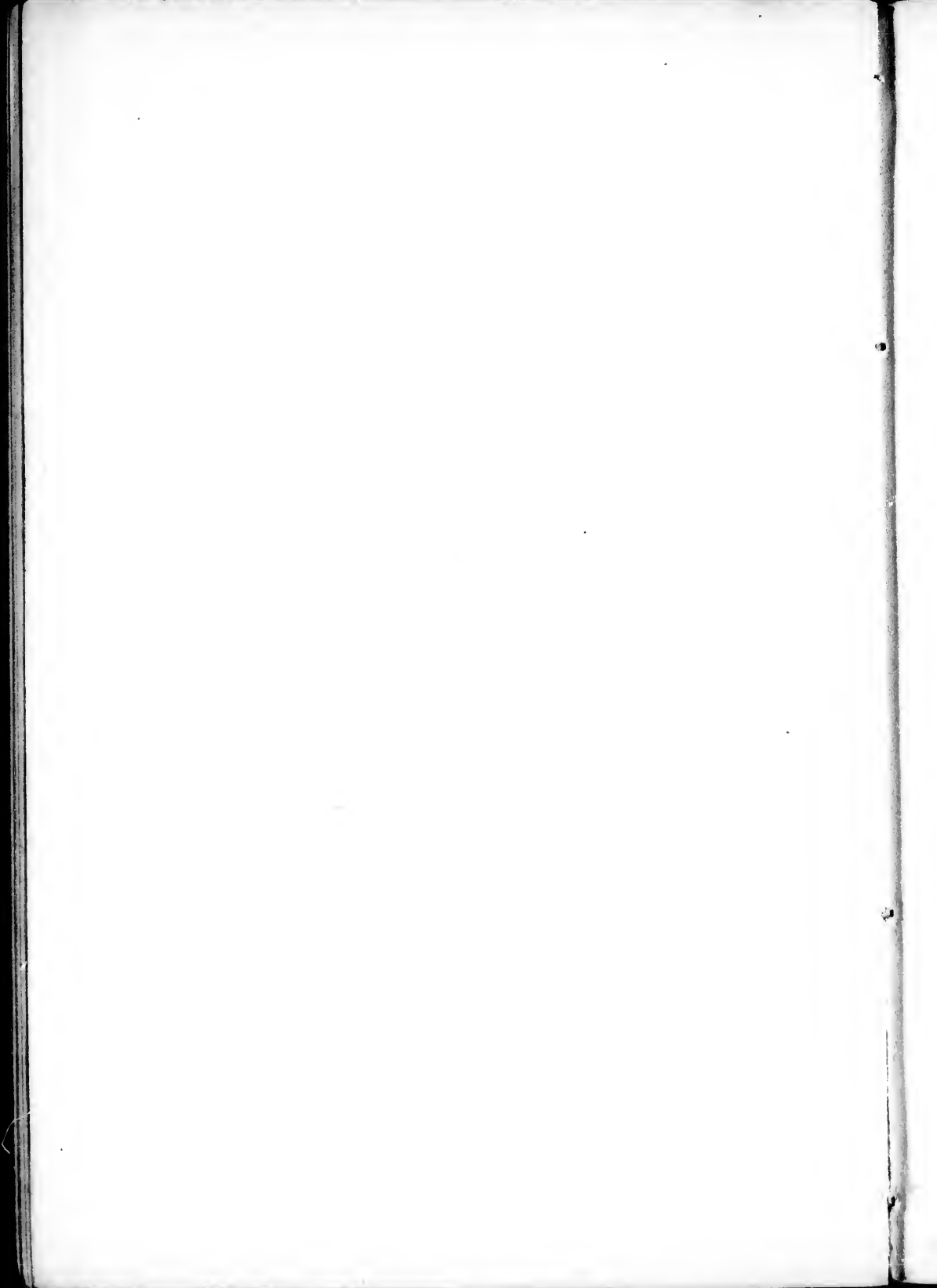
Name of County and Parish.	Acres.	Popula- tion.	Build- ings and Houses.	Grain.		Potatoes and Root Crops.		Hay.	
				Acres.	Bushels.	Acres.	Bushels.	Acres.	Tons.
<b>BERTHIER.</b>									
a. Lavaltrie .....	8,560	1,312	198	211	58,247	276	38,800	1,036	1,791
b. Lanorale.....	29,900	2,036	326	225	64,354	333	56,069	940	1,427
c. Berthier .....	7,554	1,122	179	297	58,799	174	30,969	1,167	3,160
d. Berthier Town.....	273	1,133	211	20	7,528	48	6,847	609	770
e. Isle du Pads.....	4,535	502	79	128	25,074	46	7,049	785	1,609
<b>L'ASSOMPTION.</b>									
a. St. Charles.....	4,450	426	68	138	6,765	79	4,067	424	474
c. St. Paul.....	13,854	1,048	147	211	31,546	74	10,547	778	929
f. Repentigny.....	7,008	860	126	139	39,479	84	16,021	519	888
g. St. Sulpice.....	11,415	864	160	229	52,207	117	17,690	689	1,352
h. L'Assomption.....	4,328	1,599	211	287	91,545	253	40,019	1,979	2,412
i. L'Assomption Village.....	592	1,210	223	14	2,660	85	10,072	228	447
<b>HOCHELAGA.</b>									
c. Hochelaga.....	2,640	530	76	25	3,110	42	5,750	163	277
f. Longue Pointe.....	3,438	505	84	41	16,526	130	20,528	1,019	1,159
g. Pointe aux Trembles.....	6,240	1,053	169	233	38,237	209	31,081	1,513	2,403
h. Riviere des Prairies.....	2,900	390	68	126	17,090	132	14,870	506	762
	<u>107,677</u>	<u>14,910</u>	<u>2,385</u>	<u>2,327</u>	<u>513,167</u>	<u>2,082</u>	<u>310,349</u>	<u>13,362</u>	<u>20,060</u>

NOTE.—The letters a, b, c, &c., are for reference to the Map.

MONTREAL, August 4th, 1875.

Statistics (Census of 1871) to accompany reports.

BEMISTER & SLATEL, Civil Engineers.



T.

Na	St and ma	Hands.
Bertl		8
Jolie		18
Mont		...
L'As		7
Terre		6
Lava		10
Hoch		5
		—
		54

s.	G)
Bertl	1
Jolie	
Mont	
L'As	7
Terre	
Lava	10
Hoch	8
	—
	29

TABLE No. 3.

## INDUSTRY

Name of County.	Agricultural Implements.		Black-smithing.		Foundries and machine working.		Tin and sheet iron working.		Furniture, Carpenters and Joiners, and Carriage making.		Cooperage.		Carding and falling mills.		Saw mills.		Tanneries.	
	Hands employed.	Value of articles produced.	Hands employed.	Value of articles produced.	Hands employed.	Value of work.	Hands employed.	Value of work done.	Hands employed.	Value of articles produced.	Hands.	Value of work.	Hands.	Value of work done.	Hands.	Value of work produced.	Hands.	Value of work produced.
Berthier.....	2	\$ 1,200	40	\$ 14,614	...	...	4	\$ 3,000	53	\$ 29,070	2	\$ 370	8	\$ 19,620	65	\$ 34,934	65	\$ 119,550
Joliette.....	3	3,300	46	18,110	17	7,930	11	5,895	93	23,918	5	816	10	27,020	92	81,545	14	36,988
Montealm.....	...	...	41	17,040	...	...	12	3,000	58	18,758	2	425	7	16,480	52	32,070	10	10,421
L'Assomption.....	4	1,700	43	16,139	5	2,200	10	5,840	115	38,506	1	400	11	20,930	350	233,956	10	6,930
Terrebonne.....	30	40,400	58	25,669	...	...	6	3,360	70	27,722	10	2,005	19	75,935	78	79,188	64	90,918
Laval.....	1	540	37	13,878	...	...	9	3,588	76	31,677	1	65	2	4,080	15	21,097	2	1,540
Hochelaga.....	43	60,000	58	32,210	63	57,000	5	2,390	181	242,525	8	5,300	3	2,096	...	.....	131	310,616
	83	107,140	323	137,690	85	67,130	57	27,073	646	412,176	20	9,381	60	166,161	652	482,700	296	576,903

## FARM PRODUCTS.

Name of County.	Working animals.	Other farm animals.	All farm implements.	Animals killed or sold.	Wool. lbs.	Honey. lbs.	Butter and cheese. lbs.	Dressed Flax. lbs.	Linens and cloths. Yard
Berthier.....	6,234	53,725	18,763	21,207	61,243	28,050	424,671	46,295	140,210
Joliette.....	5,651	53,045	19,208	18,572	58,684	15,268	428,848	29,762	131,550
Montealm.....	4,150	31,064	14,521	13,400	34,607	11,410	450,375	16,110	83,680
L'Assomption.....	5,588	40,303	17,738	17,771	45,127	16,691	569,912	27,750	88,620
Terrebonne.....	5,234	40,013	18,878	15,937	51,701	17,951	559,913	30,881	94,920
Laval.....	3,177	17,195	9,030	7,871	18,654	13,524	258,578	12,139	40,660
Hochelaga.....	4,476	13,713	11,560	8,181	11,228	9,106	215,803	1,100	11,990
	34,510	249,058	109,698	102,939	281,244	112,096	2,908,100	164,037	591,660

MONTREAL, August 4th, 1875.

# INDUSTRIES.

Industries.	Tanneries.		Boots and shoes.		Saddle and harness making.		Tailors and clothiers.		Wool cloth making.		Lime kilns.		Charcoal burning.		AGGREGATE VALUE OF ALL INDUSTRIES.				
	Hands.	Value of work produced.	Hands.	Value of work produced.	Hands.	Value.	Hands.	Value.	Hands.	Value.	Hands.	Value of work produced.	Hands.	Value of work produced.	Capital invested.	Number of hands employed.	Amount of yearly wages.	Value of raw material.	Total value of products.
\$		\$	\$	\$		\$		\$		\$	\$		\$	\$	\$	\$	\$	\$	\$
1,934	65	119,550	28	15,950	8	7,100	6	5,500	...	...	9	334	...	...	124,165	356	43,829	193,870	367,819
1,545	14	36,988	69	30,847	18	7,066	19	8,132	2	7,314	27	2,430	...	...	125,325	559	54,748	313,117	553,545
3,070	10	10,421	26	9,547	...	...	1	200	...	...	13	880	...	...	98,195	303	30,203	191,169	287,515
3,956	10	6,930	29	52,535	7	4,100	1	500	...	...	7	1,232	...	...	240,630	666	92,847	416,055	660,455
9,188	64	90,918	31	11,230	6	2,665	...	...	19	2,300	11	1,710	44	10,177	251,372	636	67,300	458,318	737,318
1,097	2	1,540	36	4,787	10	2,135	65	21,358	...	...	10	2,648	...	...	86,834	308	91,938	98,760	181,638
...	131	310,616	92	39,800	5	2,250	...	...	...	...	19	48,500	...	...	977,633	1,597	457,537	1,829,530	3,071,954
2,790	296	576,963	311	164,744	54	25,316	92	35,090	21	9,644	96	57,784	44	10,177	1,904,154	4,425	778,462	3,500,819	5,860,244

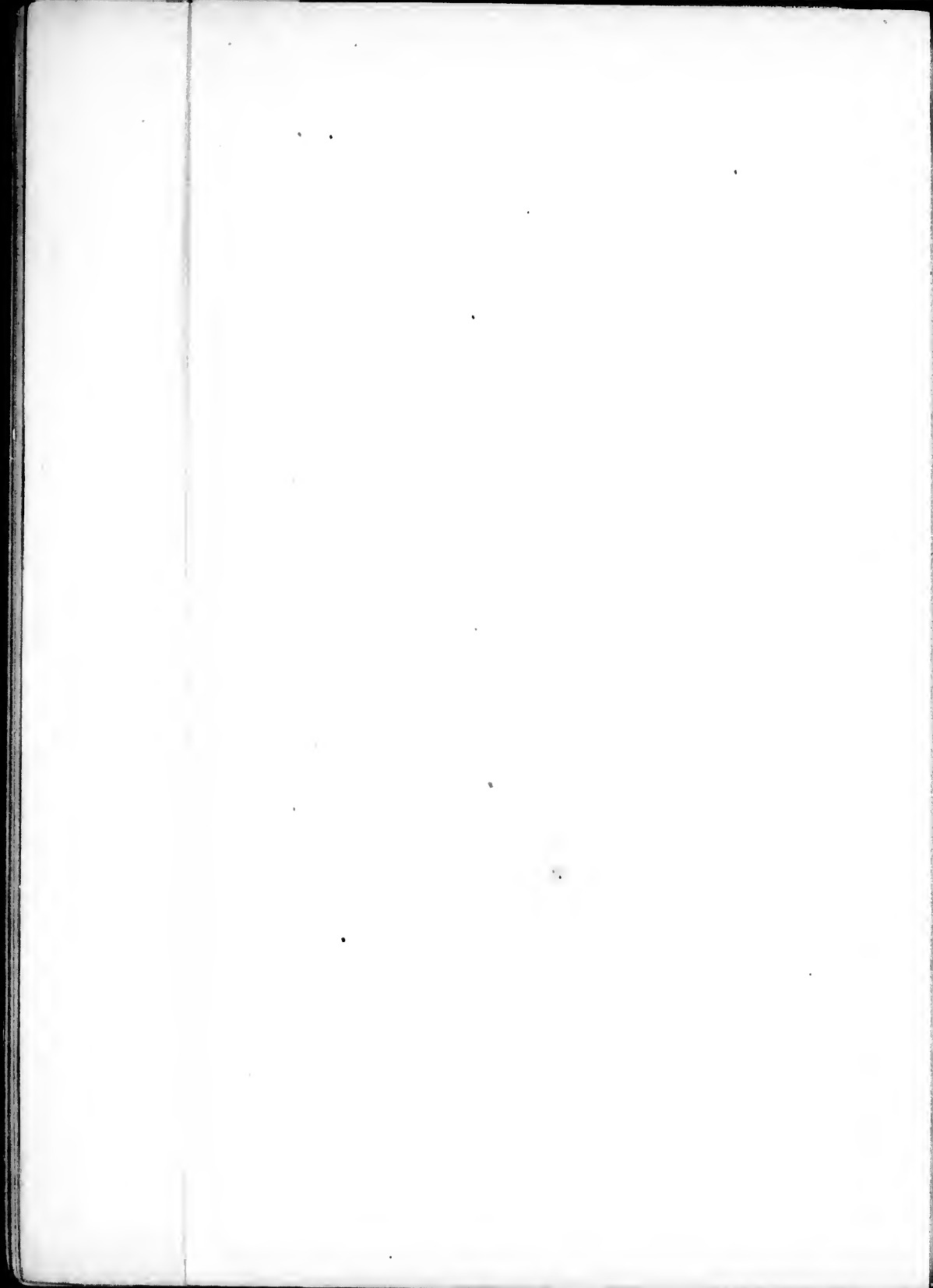
# PRODUCTS.

## FOREST AND MINERAL PRODUCTS.

Dressed Flax.	Linen and cloth.	Apples and other fruits.	Grapes.	Maple sugar.	Tobacco.	Hops.	Timber.	Logs.	Tan bark.	Firewood.	Stone.
lbs.	Yards.	Bushels.	lbs.	lbs.	lbs.	lbs.	c. ft.		Cords.	Cords.	c. ft.
46,295	140,216	4,945	1,830	158,622	78,064	256	402,142	35,062	721	70,243	.....
29,762	131,554	3,067	795	389,756	39,311	81	167,448	223,687	558	67,754	22,680
16,110	83,630	1,618	477	320,183	21,486	307	56,410	128,811	478	39,010	.....
27,750	88,026	3,292	7,079	117,651	40,838	517	193,081	135,196	22	37,790	.....
30,881	94,920	3,646	534	111,466	38,395	394	170,664	159,582	687	76,947	23,780
12,139	40,667	9,284	10,400	44,412	24,657	39	54,509	3,121	22	14,868	12,100
1,100	11,991	48,489	8,721	12,265	20,504	293	4,934*	3,240	0	9,102	210,028
164,037	591,600	74,371	29,842	1,154,385	263,345	1,892	1,049,788	688,699	2,488	315,714	368,588

Statistics (Census of 1871), accompanying reports.

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Civil Engineers.



## TABLE No. 4.

Counties served by proposed route between Maskinongé and Montreal, compared with Counties Maskinongé to Quebec (inclusive) served by the North Shore Company's line.

Name of County.	Acres of land owned.	Acres of land occupied.	Acres wild.	Population.	Number of churches
Berthier . . . . .	223,900	194,742	29,158	19,804	10
Joliette . . . . .	231,346	219,401	61,945	23,075	15
Montcalm . . . . .	205,981	177,554	28,427	12,742	13
L'Assomption . . . . .	194,302	150,206	44,096	15,473	13
Terrebonne . . . . .	290,189	246,563	43,626	19,591	17
Laval . . . . .	73,131	59,514	13,617	9,472	6
Hochelaga . . . . .	99,654	54,578	45,076	25,640	18
	1,368,503	1,102,558	265,945	125,797	92
Maskinongé . . . . .	207,937	160,343	47,594	15,079	9
Saint Maurice (South) . . . . .	156,704	131,543	25,161	10,658	8
Three Rivers . . . . .	98,623	15,840	82,783	8,814	5
Champlain (South) . . . . .	197,758	147,536	50,222	13,885	8
Portneuf . . . . .	366,116	287,332	78,784	22,569	19
Comté de Québec . . . . .	363,727	129,244	234,483	19,607	20
	1,390,865	871,838	519,027	90,212	69

Statistics (Census of 1871,) accompanying reports.

BEMISTER & SLATER,

MONTREAL, August 4th, 1875.

Civil Engineers.



