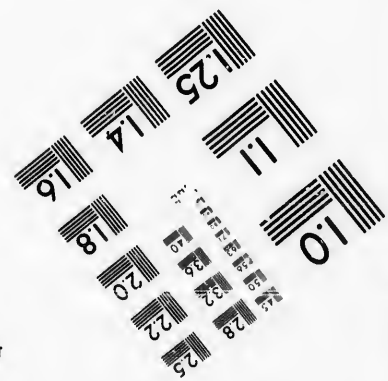
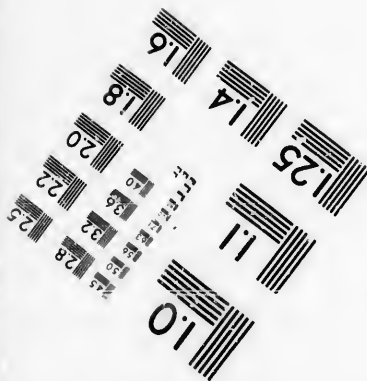
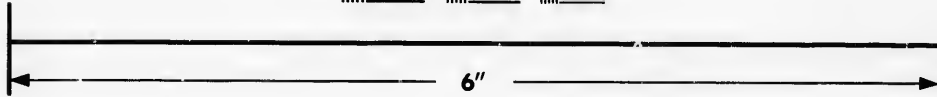
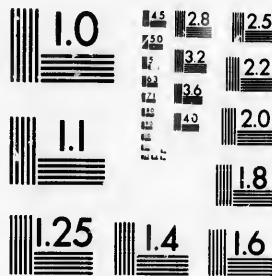


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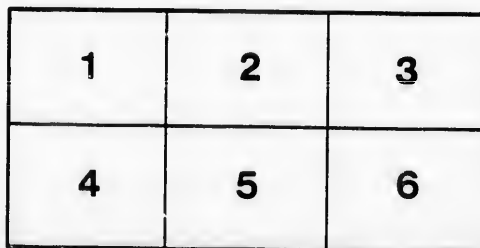
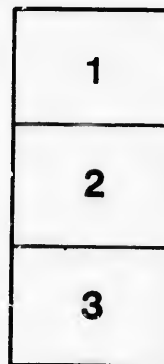
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MONTREAL
NORTHERN COLONIZATION COMP'Y.

Report of Chas. Legge, Esq., Chief Engineer of the Montreal Northern Colonization Railway Co., on the interview of the 16th December, 1874, between the Hon. Alex. Mackenzie and a joint deputation of that Company and of the North Shore Railway Company.

OFFICE OF CHIEF ENGINEER,
Montreal, 4th January, 1875.

SIR,—I am in receipt of your favor of the 31st inst., this morning, requesting "A Report to be prepared, for the information of the President, then absent, of what took place in the interview lately held at Ottawa, between the Honorable Premier of the Dominion, and the joint deputation of the North Shore and Northern Colonization Railway Boards, and at the same time to embody therein any suggestions you may think proper to make to our Board, concerning the important subject treated in Ottawa by the joint deputation."

Having been notified that a meeting of the Board will be held to-day to consider this matter, time will not permit of any extended report, I will, therefore, confine my remarks to a few engineering points, more especially as several members of the Direction were present on that occasion, and will be able to give verbal reports on the general points discussed, which, together with the full newspaper accounts, will make the President fully conversant with the rather unsatisfactory results arrived at.

I first beg to submit a printed copy of the memorial presented by the joint deputation, which, after the usual descriptive matter, ends as follows:

"The undersigned, firmly believing the Quebec and Matawan route to possess superior engineering and traffic attributes, at the same time capable of being more economically constructed in so far as the Dominion Government would be called on to contribute, forming also an inter-provincial work, in contra-distinction to the mere local or provincial lines already alluded to, most earnestly desire; first, that the line to be subsidized from Lake Nipissing, in the general direction of Ottawa be left an open question, until thorough surveys, and the financial assistance to be rendered the rival lines by the Provincial Governments and Municipalities, shall have demonstrated the most suitable one in engineering, traffic working and financial points of view, for the Dominion Government to adopt and assist."

"From the best information acquired, as will be shown by the reports submitted herewith, it would appear that the route by the Matawan is best adapted on the whole, for the traffic between the West and the East, and is strongly urged upon your attention; justice to the Province of Quebec demanding that this route be adopted in preference to any other. In case this justice to the said Province be refused, it cannot be doubted that the Dominion

"Government ought to construct as a federal work, the entire line of railway from Georgian Bay to some suitable point of connection with the Province of Quebec, at Pembroke."

"Moreover, the two companies urge your Government most respectfully and energetically, that in any arrangements which might be made for establishing a communication between the terminus of the Canadian Pacific Railway and the Railways in the Provinces of Ontario and Quebec, the terminus of the said Pacific Railway remains as fixed by the Act of Canada, 35 Vic., Cap. 71, on or near the south-eastern end of Lake Nipissing."

Prior to referring to the Hon. Premier's remarks, I may mention that the detailed instrumental surveys of the line on the North Shore, from Aymer to the Matawan, have been completed, under the able superintendence of Mr. Starke, C. E., and a far more favourable condition of line, both in its engineering characteristics and cost, has been found than I have ventured to anticipate. A very valuable and exhaustive report from that engineer, together with full details of cost, maps, profiles, &c., &c., is herewith laid before you.

In the reports of March, 1873, and 31st March, 1874, on the hurried preliminary explorations then made from Aymer to the mouth of the French River, via the Matawan, the cost of the entire line—about 290 miles,—was placed approximately at \$30,000 per mile, embracing rolling stock and other necessary adjuncts of a Railway.

From Mr Starke's detailed estimate, it appears that the total cost of a line from Aymer to the Matawan, with iron rails and wooden bridges, is \$5,008,955, or for a total distance of 173 miles, will average but \$29,000 per mile.

In this sum, which is based on most liberal prices, are also allowances of 5 per cent for sidings, the large sum of \$692,000 for rolling stock, \$86,000 for station buildings, &c.; with the very wide margin of \$455,000 for contingencies.

If steel rails and iron bridges are used, the total cost, covering the aforesaid items, will be \$5,459,426; or at the rate of but \$31,557 per mile, including \$496,000 for contingencies.

It will thus be seen that with iron rails, &c, a line of 173 miles in length, one-half at least of it being exceptionally expensive, has been obtained for \$1,000 a mile less than by my rough-eye estimate.

The balance of the road from the Matawan to mouth of French River, is less expensive to build, but the extra cost of getting mate-

rial on the spot will probably equalize the price. Having been over the country, I can with confidence now state the entire cost of the work from Aylmer to the Georgian Bay via the Matawan, will not exceed \$30,000 per mile, for a line with iron rails, fully equipped, and at the same time leave a margin of profit in the pockets of the contractors, of not far from \$1,000,000.

So much, in relation to cost of your line. With reference to that recommended by the honorable Premier, from Renfrew or Pembroke, to the mouth of French River, we have absolutely not the slightest clue to arrive at any conclusion as to the probable cost. It is true the country, or a portion of it, to be traversed by the lines in the direction of Pembroke and Renfrew, was explored by Mr Hazlewood during last summer, and extracts from several of his letters are given by Mr Fleming, for the information of the honorable Premier, and of intending contractors, but nothing of a definite character as to cost, elevations, &c.

This document, accompanied by a specification for the construction of the railway both drawn up by Mr Fleming, are herewith submitted.

It certainly appears a little strange, after an expenditure of so many hundreds of thousands of dollars by the Dominion Government in making surveys for the Pacific Railway, that on the first section of some 217 miles in length, from Renfrew to mouth of French River, the first instalment advertised to be let, and on which tenders are to be received for its construction, not a single brass instrument has been used in the way of making surveys; to ascertain the cost. That the Government, engineers, intending contractors, and the public generally are as profoundly ignorant of the geographical, geological and engineering features of the country to be traversed as they were of the interior of Africa before the great Livingstone's explorations; and under those circumstances any person or company seeking to tender for the work, between the limited time, 16th of November last, the date of general conditions and of specifications supplied by the Government, and the end of December last, the date of receiving tenders, must, in framing their haphazard estimates, have had no sufficient time allowed to pass over the country even in the most cursory manner.

A tender of \$40,000 per mile, might under those circumstances, have been looked on as being more within the margin of safety, than our comparatively moderate sum of \$30,000 for the Matawan route; however, time and the opening of the tenders will reveal.

In the course of the honorable Premier's remarks, he dwelt largely on the fact that as measured on the map, the route from the mouth of French River, via Renfrew, to Montreal, was a more direct one than that via the Matawan.

This fact has never been denied or concealed by us. On the contrary, it has been acknowledged, as will be seen by consulting page 4 of printed letter addressed to you, under date of 24th September last. As this will be found one of the most important points urged by the first Minister, and on which his decision will probably hinge, the following copious extract will be given:—
 "Why then should the Honourable Premier, who, it is understood, has no personal knowledge of the locality, insist on ignoring that solemn compact, an Act of Parliament, and move the eastern terminus of the Pacific Railway about twenty five miles directly south, to a point on the air line from mouth of French River to Renfrew, the nearest place for rail connection on the east? An answer to this question no doubt will be because this route is the shortest distance between present rail connection with the Ottawa Valley at Renfrew, and a good harbor on lake Huron, at the same time heading in the proper direction for Sault Ste. Marie, a locality ultimately to be reached with our Canadian railway system.

"To this it may be rejoined: yes, on the map such appears to be the case.

"The distance from mouth of French River to Renfrew, in a direct line, is about 205 miles.
 "To this add, say 5 per cent, for curvature..... 10½ "

"Total distance to construct..... 215½ "
 "Add distance from Renfrew to Ottawa via Canada Central..... 70 "

"Total distance from mouth of French River to Ottawa ... 285½ "

"The estimated approximate distance from Ottawa, via M. N. C. & Co. to Matawan, thence via Lake Nipissing to mouth of French River 297 "

"Showing only a saving in running distance, as measured on the map, of 11½ miles in favor of the Honorable Premier's more favorable line, as claimed. This difference is more apparent than real, as will be seen when the question is examined from another and *pre-eminently* governing point of view.

"On page 16 of the Report, addressed to you, under date of the 31st March last, while referring to the summit level to be surmounted by the Parry Sound line, in passing from the waters of the Ottawa to

"those of Lake Huron, the following remark occurs: 'What the height of this water crest above the Ottawa is, I do not know, but it must be many hundreds of feet over which to elevate the traffic.'

"Heavy grades on a line are equivalent to increased length for haulage of traffic. "In other words, of two rival lines between the same points, one possessing heavy grades but diminished length and cost, the latter one may prove the preferable one for adoption, when the future cost of haulage is considered."

"The general principle enunciated in the above, it is presumed, no engineer or railway manager will deny. We will now seek to apply it to the case before us, but in necessarily an approximate manner, as no instrumental surveys have yet been made on either line to ascertain the 'ups and downs' of the intermediate grades, as they approach from the waters of Lake Huron and the Ottawa, respectively, to the dividing crest or summit level to be passed."

"I am aware the Honorable Premier is under the impression there is no difference of elevation where the two lines cross, from information no doubt derived from other, and in his opinion, competent authorities."

"I will venture, however, to cite authorities of unquestionable ability."

"In the instrumental surveys for the Ottawa and Lake Huron Canal navigation, made by Messrs. Shanly and Clarke, we find summit level between the two before named waters, existing at Trout Lake, on the line of proposed canal navigation, and in the immediate neighborhood of Lake Nipissing, to be about 655 feet above tide-water."

"From the carefully prepared charts and maps of Sir William Logan, years 1853 and 1856, we find 'Burnt Island Lake' and 'Otter Lake,' the sources respectively of the Muskoka River flowing into Lake Huron on the west, and of the Petowahwab, discharging into the Ottawa River on the east, to be each 1,405.85 feet above tide-water."

"These two Lakes are within a short distance of each other, and lie on the Honorable Premier's air line, between the mouth of French River and Renfrew. The banks of surrounding country over which the road will pass, are considerably elevated above the water level in those lakes, while that along the south shore of Nipissing, near Trout Lake, is but a few feet. Taking, however, the surfaces of the two summit waters, Trout and Otter Lakes,

"to be within the limits of safety, we find a difference of level of 750.85 feet against the line advocated by the Honorable Premier, and over which extra height the enormous traffic to flow over the Pacific Railway, for all time, would require to be elevated. In engineering practice it is usually assumed for traffic haulage purposes, that twenty feet in vertical height are equal to one mile of level grade."

"On this assumption, therefore, the extra height, say 751 feet, will be equivalent to about 37½ miles of additional road, which, added to the already ascertained distance on the map, will make the Honorable Premier's line measure for traffic working purposes 322½ miles, or 25½ miles longer than its rival, the Northern Colonization from Ottawa City via the Matawan and Lake Nipissing to the same point at mouth of French River. These results will be rather embarrassing to the advocates of the Ontario air line, but cannot be set aside."

"My strong impression is that the final conclusions would be still more striking were there an opportunity of comparing the merits of the rival lines, after having subjected both to instrumental surveys."

"We would then be able to compare minutely the entire question of grades, curvature, measured length of lines, cost of construction, amount of subsidies to be received from the Local Governments of Ontario and Quebec, with municipal aid, if any, and then strike a balance in favor of one or other of the competing routes."

As stated in the report of 31st March, page 21: "The Dominion Government will then be in a position to judge understandingly and to act in the interests of the entire people."

You will observe from the foregoing, that this question of extra height of land to be passed over by the traffic is one of the greatest importance in determining the relative values of the two lines. In close relation also to this subject, will be the "ups and downs" of the intermediate grades as they approach these summit levels, from the waters of Lake Huron and the Ottawa respectively; information which manifestly can only be obtained for purposes of comparison, but by a minute instrumental survey of both routes."

In reference to the major point however, of extreme summit levels to be passed, the writer considered he could offer no higher authorities than the instrumental surveys of Sir William Logan, who places the summit water level of Burnt Island and Otter Lakes, on the honorable Premier's line, at 1405.85 feet

above tide water; while Messrs Shanty and Clarke give the water level of Trout Lake, the summit of the Matawan line, at 655 feet above the same datum, or a difference in favor of your line of 751 feet, representing, as before stated, a saving in point of haulage of traffic over the M. N. O. R. of 37 miles or say for all practical purposes, reducing this road, as before stated, to 25 $\frac{1}{2}$ miles less than that advocated by the honorable Premier.

I may here mention, with reference to this very important point of dispute, and with these facts before him, the honorable gentleman was good enough to remark he considered Mr. Legge had no authority for stating that any such difference in summit levels existed; thus summarily settling the question at that time.

As a matter of interest, it may also be remembered, that the honorable gentleman made on that occasion no reference to the *Prairie* character of the country through which his line is to pass, and which point was so strongly urged in the previous interview with the Pontiac deputation. Neither was any allusion made to the extra amount of money the Dominion Government would be called on to contribute in building the Ontario line, *pure and simple*, and approximately stated in the Report of 24th September last, to be an annual sum of over \$270,000, in the event of the Province of Ontario making no contribution; and also that the relative cost of the two lines per mile should be the same. The remarks of the honorable gentleman on this financial point would, no doubt, have been viewed with interest, always assuming, however, that he had not disposed of the question in a like summary manner with the *summit levels*.

The more information I acquire, and the more fully the question is examined from all points of view, the more am I convinced that the valley of the Ottawa, *via* the Matawan, is the natural, financial, commercial, and national route for this Grand Trunk line from the cities of Quebec and Montreal to the North-western Lakes; then any departure from its course will not only be a serious blunder, but a crime, the consequences of which will affect millions of people for all time.

If however, through any political or other entanglement, the hands of the Dominion Government are tied, and so prevented favoring or accepting this national route, then it becomes the duty of your Company to look after and urge the acceptance of some modification which will, under the circumstances, next best meet the general interests of the country to the greatest possible extent.

Coming back therefore to the Hon.

Premier's route, we find two lines incidentally referred to in Mr Hazlewood's account of explorations:

1st. Route from mouth of French River to Burnt Lake, thence *via* Douglass to Renfrew, a total approximate distance of say 217 miles.

2nd Route from mouth of French River *via* Burnt Lake to Pembroke 188 miles.

From the foregoing it can be seen that the Pembroke line will give 29 miles less to construct, or at the very least a saving to the Government and company empowered to build the subsidized section of \$370,000.

At Pembroke, moreover, the Ottawa River is tapped, while on the other line a connection is effected with the Canada Central Railway, some distance from that river, and seventy miles above Ottawa.

In the event of the M. N. O. R. being extended from Aylmer, along the north side of the Ottawa, to a suitable point for crossing, say at *La Passe*, in the neighborhood of Pembroke, the distance from Ottawa (as recently surveyed, *via* La Passe to Pembroke) will be 87 miles, to which add distance from Pembroke to mouth of French River, as above, 188 miles, and we have a total distance from that place to Ottawa city of some 275 miles.

The distance from mouth of French River *via* Renfrew, and the Canada Central, will in like manner be 287 miles, or about 12 miles longer than the Pembroke and the M. N. O. R. route. This difference arises to a great extent from the *detour* made by the Canada Central *via* Carleton Place.

It will thus be seen that even on the Honorable Premier's own ground, (shortness of distance) Pembroke will be the point to aim for, and not Renfrew—to say nothing of the extra \$370,000, saved to the Government by the Pembroke route. By many it has been urged that the M. N. O. R. should cross at Portage du Fort, and seek a union with the Government subsidized line at Renfrew or Douglass. From some personal acquaintance with the rough character of the country between Portage du Fort and Renfrew, I was fearful that a road through that section would be very expensive. Mr. Starke, while prosecuting the Upper Ottawa surveys, was directed to make a special examination of the place, and afterwards reported that it would be nearly, if not altogether impracticable, to construct the line from Portage du Fort to the localities referred to. Renfrew and Douglass had thus to be abandoned, and Pembroke selected as the point of junction, from whichever direction the Government line might approach it, either direct from

mouth of French River or from Lake Nipissing.

Summing up the subject, and leaving out the Matawan for the present, a junction of the M. N. C. B. must be effected with the Government subsidized line to Renfrew, either at Ottawa, through the intervention of the Canada Central, for seventy miles, over which road the Government can exercise no control in giving running powers, but which must be the result of private arrangements; or the point of union between the M. N. C. B. and the Government subsidized line must take place at Pembroke, *via* La Passe, direct.

In this latter case the Canada Central would have simply to extend its road from Renfrew to Pembroke, a distance of thirty miles, over a comparatively level and cheap country for construction, to join the common subsidized line at that place, on the same footing with the M. N. C. B.

My own impression is that, on more mature consideration, the Dominion Government will postpone the letting of the work from the mouth of French River, easterly, to Renfrew, or Pembroke, until thorough instrumental surveys are made and some adequate information obtained regarding the character of the country and obstacles to be encountered.

To do so will be but the act of wise men, as we may be well assured no capitalist will furnish the large balance of money required to complete the subsidized section without those bonds are guaranteed by the Government, more especially as for years to come there will not be a paying traffic passing over the road for more than six months in each year. The Government will

therefore, to all intents and purposes, be at the entire expense of construction, and would no doubt find it in the public interest to dispense with the intervening Company. Under those conditions the M. N. C. B. and Canada Central, with any other railways from Ontario or Quebec, centering at Pembroke, would have immediate access to and running arrangements over the Government line to Georgian Bay, and eventually to Sault Ste. Marie.

In concluding these hurried remarks, it cannot be too strongly urged on your Company, the necessity of making a connection with the Government line at Matawan or Nipissing if possible; but failing that, then at Pembroke *via* La Passe. This will give you independent powers through the Province of Quebec to the utmost limit attainable; but while urging this course, I would also still recommend the construction of a bridge at Ottawa City, and a union at that place with the great lumber yards on the south side of the river, as well as with the Canada Central, and other lines of railway coming in from the East, South and West, for the mutual and economical exchange of freight and passengers.

I have the honor to be,

Sir,

Your obedient servant,

CHARLES LEGGE,

Chief Engineer.

E. LEF. DE BELLEFEUILLE, Esq.,

Sec. Treas.

M. N. C. B.

