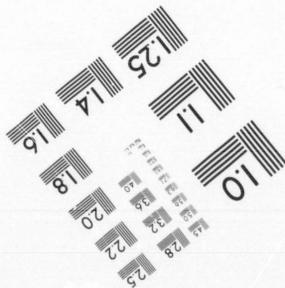
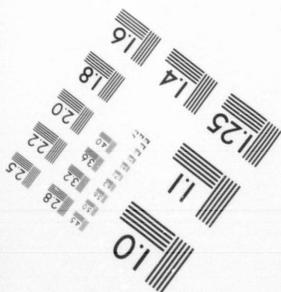
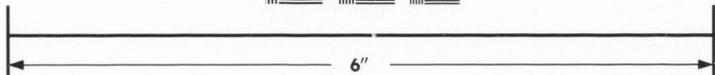
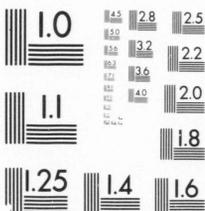


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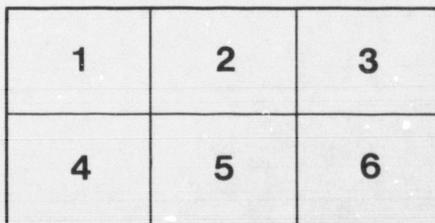
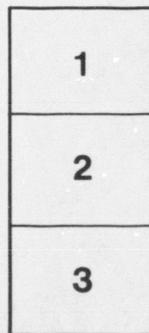
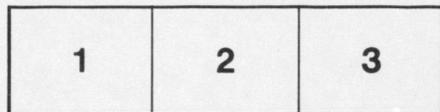
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REPORT
BY
P. Florent
CHARLES BAILLAIRGE

City Engineer, to the City Council

ON THE
3RD SECTION
OF THE

QUEBEC & LAKE ST. JOHN RAILWAY

NORTHWARD FROM

ST. RAYMOND

Québec Sept. 24th 1885.



QUEBEC :
GEORGES VINCENT, CITY PRINTER

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Quebec, Sept. 24 1885.

REPORT

BY

M. BAILLAIRGE

City Engineer, to the City Council, on the 3rd Section, under the new contract with M. Beemer, of the Quebec and Lake St. John Railway, Northward from St Raymond.

St. Raymond lies 36 miles from Quebec ; St. Cimon or lake Cimon, ten miles northward thereof ; the second section reported on by me last year, ten miles in advance of St. Cimon ; and section three now reported on, still 10 miles northward of the last : commencing and ending at 56 and 66 miles respectively from Quebec.

Mr. Ridout on part of the Fed. Govt., Mr. Light as representing the Local, and myself on part of the Municipal, left town by special train at 11 A. M. of Sept. 3rd. by the North Shore Railway, in company with Mr. Hoare, Mr. Beemer's managing engineer, a brother of the contractor and Mr. McDonald on his part ; and Mr. Scott Secretary-Treasurer on part of the Company. At 12½ p. m. we reached St. Raymond ; in another half hour we were at Lake Cimon and at 1½ P. M. we had reached the point where our operations were to begin.

To facilitate observation and with plans, sections, specifications and contract in hand, we transferred ourselves and assistants to an open plat-form car where the three judges sat side by side on wool-sacks though without the powdered wigs emblematic of the duty to be performed.

Not acting in concert, we of course took, each his own notes.

In riding over the previous sections we noticed that the deficiencies of last year and the year before had been made good with the exception of a few hundred feet over an apparently bottomless swamp, like the Chat moss on the line of Liverpool and Manchester railway, which when added to from above, as pertinently kept sinking from below, and only remained permanent after ten successive additions to its surface and 20 feet in depth of fascines, with a series of perforated kegs on either side of it, to drain off the water ; I say, that like the Chat bog, this one must be drained and fascined, and built up in successive layers until such a foundation is reached as will allow of its retaining its proper level, and this is being done as fast and conveniently as allowable.

The superstructure of Black River bridge, unfinished at the time of our inspection of section 2, has since been completed, the trestles filled in, the dump widened out and the ballasting of the section made good after rectifying levels and alinements.

The present section is an almost uninterrupted series of cuts and fills : all heavy work, with much solid rock. The stone is gneiss or metamorphic rock, with its usual striated and apparently stratified appearance, though much of it, as we advance, is found to be of a very fine texture, similar and equal in quality to the best granite. It has been utilized, I am glad to say, in the bridge piers and in culverts, where it can be seen in heavy blocks of coursed cut ashlar with rock face finish, thus dispensing with the necessity as heretofore of obtaining the material from Deschambault, Terrebonne and elsewhere.

The stone culverts of from 5 to 6ft. section are under deep and therefore broad embankments ; they are built in Portland cement and are oftentimes of as much as 60 to 80ft. in length.

Rivière à Pierre which though reached and seen at about one mile from the beginning of the section, is not crossed until nearly a mile and a half further, or at Station 2810, is spanned by a steel and iron structure, which is an improvement on other bridges of the kind. It is a credit to all concerned and does honor to its builders the " Dominion Bridge Co." of Lachine. The span is 150 feet and the piers, as may have been already inferred when speaking of the stone of which they are built, are of cut masonry in 18 to 24 inch courses in Portland cement and of the most enduring and permanent character.

The road now follows along the western side of the à Pierre River for a little more than another mile, when it leaves it to follow out its North-western branch to within a mile or so of the end of the section. The road crosses and recrosses this northern branch at stations 2962 and 2985 at apposite ends of Chub lake, on the usual flooring of 8x12 inch pine beams at 20 inch centres supported from heavy iron and steel girders of 33 feet span on solid stone piers of the same character as those of the bridge just alluded to. It may be said here to the credit of Mr. Beemer that while he has put in iron girders as just mentioned, the contract only required wooden structures.

River à Pierre Station bids fair to become a thriving place, several houses having already been erected and amongst others a double mansard roof building of some 60 feet frontage answering the purposes of a hotel : one Labrecque is the proprietor.

The line after following close along side the North branch of River à Pierre for about $5\frac{1}{4}$ miles, with easy grades and picturesque surroundings, terminates its 10 miles length of section at station No. 3215 at 30 miles from St. Raymond as already mentioned.

A halt was made here and the environs examined. It being considered important, partly with the view of making up for deficiencies in the section just gone over, to see what work was done on the next section and too late in the evening to reach the Batiscan on foot after driving over the 5 miles of rails laid on section 4, the party increased by Mr. Cressman, Beemer's manager and Cadman the Company's Chief Engineer, put up for the night at what is called the "Windsor" a log house of large dimensions with flat roof in the Italian style erected by Mr. Beemer, but where all the dainties of the season were to be had under the fostering care of Mr. and Mrs. Smith, the lessees of the establishment, including corned and roast beef, ham, eggs, the best of potatoes, tomatoes, preserves, pudding and pies quite equal to those of the bigger establishment of the same name, tea, coffee, cigars ad libitum and all for a merely nominal price ; not forgetting before going to bed, the usual night cap with, in lieu of a stick, a telegraph pole in it, as Mrs. O'Brien would say. The undersigned considers it to be not out of place to mention these facts as it is important that tourists from Canada, the United States and elsewhere should be aware that while on a fishing or shooting excursion in this mountainous district, they can not only fill their baskets with the best of speckled trout from the numerous lakes along the line and at only a few minutes walk therefrom ; they can not only during the

proper season, hunt and run down the moose and cariboo; they can not only feast their eyes on the bold and gorgeous scenery along the line of railway and its vicinity; but can also feast themselves to their heart's content under the hospitable roof of the Smith's which lies in a well wooded valley of hard wood trees, nicely sheltered from all surrounding winds.

After a first rate breakfast, the party proceeded on its inspection at 7½ A. M. of the following day; We rode on a freight train of platform cars loaded with railroad iron, steel ties, wooden sleepers and the like; to where track laying was at that time being vigorously prosecuted; that is, to not less a distance than some 5 miles or more, beyond section 3 and into section 4. At station 3380, or about 3 miles beyond section 3 and at 33 miles from St. Raymond, we came upon and got our first glimpse of the Batiscan. It is hemmed in by mountains from 600 to 900 ft. in height, presenting like the St. Maurice at the Grand Piles, much of the wild and vivid scenery of the Saguenay, though not on so grand a scale, the river being less deep and only some 300 to 400 feet in width.

The road now follows along the left or East bank of the river to where the track is laid at 35 miles from St. Raymond and 71 from Quebec; and as it ascends continuously with the river, which is not at all rapid, except very slightly so at certain points, a very easy grade is now being continued from here towards the McQuick and lake Edouard.

We vacated or were, so to say, dumped from our jaunting car at the end of the track and thence proceeded on foot for nearly 2½ miles further, or to near station 3600 over the graded road bed at formation level, being 7½ miles on section 4, with information from Cadman, Hoare and others that the grading is done to nearly one mile beyond section 4, with some 500 men working ahead at cutting, clearing, grubbing etc. on section No 5 beyond where the McQuick empties itself into the Batiscan; and 300 more men coming from New-York to replace those of our Canadians who, at this season, have to leave work on the road to attend to their farms and harvesting.

Cadman and I had proceeded for some distance ahead of the remainder of the party, when to my regret, and at only 9½ A. M., we were recalled by the shrill cry of the steam whistle and had to retrace our steps southward, as on account of the unavoidable delays at sidings on the route, to make way for freight trains, ballast cars, steam shovels, track laying, etc., we could not, unless we then returned, get back to Lake Cimon in time to catch the train for Quebec

where M.M. Light, Ridout and Hoare had to be that evening to attend to other engagements on the morrow.

As for myself I could have gone on for miles, amidst the wild and lovely scenery of the river-girdled glades and hills, and though not an over ardent admirer of the beautiful; though not given, that I am aware, to an over dose of sentiment, I sincerely pined those who had not as yet been witness to the scene. We are all, more or less, seeking after novelty and the unknown. The situation was too vast: I could not take it all in and felt as if I would you were all there, Mr. Mayor and gentlemen with your kin and friends and the ladies to feast your eyes and hearts on the glories of a lovely day amidst our canadian forests.

We had soon returned on foot to a beautiful spring of clear and cold water to the northward of beaver meadows when, after tasting of the limpid stream and casting a parting glance at the twin mountains of Sion from whose bosom there appeared to distill, as of old, milk and honey, Cadman and I in company with the remainder of the party whom we had left behind us at frog (alias grog) inlet and frying pan creek, mounted our jaunting car once more and proceeded on our journey homeward, when after bidding adieu to Russell and Shaw of camp comfort, assistant Engineers on the road and who had done all in their power to make our stay agreeable, we reached town at about 7 P. M. in what may be considered very good condition for that which appeared to us under the bracing influence of mountain air and traveled to be a long delayed supper, though we had had a hearty lunch at the windsor at noon, but so long ago that we had well nigh overreached its beneficial effects.

It is necessary that one and all should see for themselves this really first class road among the mountains. Gentlemen of the Local and Federal, let me impress upon you the advisability of visiting the country that you may judge of its floral and mineral wealth. I was astounded at the piles of fire wood cut from the right of way alone, which I estimated at as much as 52 cords on 200 ft. of the road clearing by only 100 in width, some 20,000 sup. feet or less than half an acre, while 50 cords to the whole acre is not considered at all out of the way and fully $\frac{2}{3}$ of this is black and red birch with a goodly proportion of other hardwood.

Three parties: Voyer, Atkinson and another are about to erect mills it is said, on the A. Pierre and Batiscan rivers; and when I say that last year Sewell alone furnished 1213 car loads of fire wood and lumber of all kinds towards the traffic of the road, some idea may be

formed of the vastness of the lumbering business in store for the enterprise when carried to completion.

I have already alluded to the stone as seen at the several cuts along the line, and would say that it divides up easily into square blocks, as witness its employment in the coursed masonry of the bridges alluded to; it is easily worked and of fine appearance: much of it like that of which is now being erected the portico of our new Court House in St. Lewis Street.

Boulders there are in immense quantities and in successive layers—I counted 7 such separate layers or strata of them in one cut some 30 ft. in depth at station 3444 or near the 35th mile from St. Raymond—piled one above the other during the glacial stage of the quaternary epoch. Yes, these millions of boulders of all sizes from that of a marble to others weighing a hundred, nay a thousand tons or more, here they are—it would do a geologist's heart good to see them—fragments of rocks ground down on all sides and rounded off by the hand of time in their irresistible march southward from the Laurentides and mountainous districts further North, rolling over and over throughout distances of may-be hundreds of miles, carried along as they were, or are supposed to have been, by the sea of ice which like the Alpine and other glaciers of the present day, produce a like effect though on a smaller scale.

I have already given it as my opinion that the only paving material for steep acclivities like gallows hill, is boulders—and there are enough here to pave a hundred cities—for while on such inclines macadam can not be made to stand, cut paving is unfit for hills any steeper than Mountain hill, as it offers no catch or hold for the horses hoof or toe, while small boulders of the size of a pine apple and of that proportionate length, like those so much used for hilly ground in Boston and for water courses, will just fit the hoof and secure a proper footing.

I must not be misunderstood: boulder paving is unfit for level streets as in Sault au Matelot street where in addition to their being of far too large a size, they allow of the dirt collecting in their interstices and can not be kept clean; whereas in situations like the old upper-town market place, Church St. hill and other acclivities where they have been in use for some 20 years or more, elsewhere for 50 and 80 years, they are washed clean by every successive rain and always present a neat and unobjectionable appearance. There is another material here which it behoves me to mention, as among the economic features of the enterprise: I allude to the live standing

tamarack to be had along the line, and precisely the sizes required are those which are too small for railroad ties or any other purposes but scaffolding poles. A few years ago there existed almost a rage for the so called Nicholson pavement, which like other epidemics has died out in the Canadas and United States and is now raging like cholera and small pox in Europe and other lands. Nations like individuals will not learn nor profit by other's experience ; they must try the thing for themselves. I have been now 19 years in the civic service and so certain was I that the Nicholson would come to grief that never would I allow one inch of it to be laid in Quebec, while Montreal was all the rage for it and as is well remembered, it rotted out as I had predicted in from 3 to 5 years and had to be replaced in Jacques-Cartier square, great St. James St. and elsewhere and generally throughout America wherever introduced.

Some 40 years ago, a few of our streets were paved during my predecessor Hamel's time, and I believe at his suggestion and that of my late father, with round blocks of tamarack. Whether they were or not the generators of the system, I can not say, as, likely, such a mode of pavement should and must have suggested itself years ago to engineers and road makers in localities where saw mills were deficient and the surface of streets and highways bad and unimproved. Shortly after this paving was laid in Quebec, it was torn up for the introduction of our water works and drainage; it there remained forgotten, remnants of it persisting along the sides of streets filled in between with macadam, until I had occasion a few years ago to take some of it up which I found to be perfectly sound to the very core, and not worm down by more than an inch or two out of 6 or 7 after 35 years usage. I have some of these blocks which any one can see in my office at the City Hall and wrote a letter of congratulation to the mayor of Toronto when I heard of that City resorting again to the round block pavement as now laid in Yonge and other streets of the Queen City of the West. This paving however is of cedar, not of tamarack, and I am still inclined to think that to the one essential element of its success: the unhewn block, should be added that of quality of timber ; the first as conducive to longevity, by reducing the surface of contact of the adjoining blocks to a minimum and thus preventing them from rotting as they do in the close jointed Nicholson ; the second, the harder and more enduring nature of the material under the heavy traffic of our narrow and crowded streets.

The sizes best suited for paving may vary from $4\frac{1}{2}$ to 8 or 9 inches in diameter and I may be permitted at this juncture to call the attention of the City Council to the advisability of getting out

enough of this material in the spring to pave the Grande Allée or St. Louis Road from end to end and such other promenade thoroughfares, at a far cheaper rate than stone and much more durable, as the pores of the wood presenting themselves upright to the traffic, fill with grit, when the surface of the wooden block becomes harder, so to say, than stone, or at any rate more durable and is not to be worn away as stone is by the combined action of friction under wet or moisture.

Again I say, Gentlemen of the City Council, Ministers of the Federal and Local, the peoples representatives, in general : visit the locality and judge for yourselves. We should do so, we do not know our geography of Canada. No more did the French, when beaten in 1870 by the Germans who had studied french itineraries much more diligently than the French themselves. We do not know our geography and hence we are beaten on our own territory by out-siders on such questions as the "Short Line" between Montrea and the Maritime Provinces. There are other things we do not know and should know, for we read not or pass our time at clubs while others are arming themselves with weapons to defeat us. Had our representatives in Parliament known, when on the question of the bridge at Cap rouge, that the bridge of similar construction now in course of erection over the Firth of Forth in Scotland, is being done under a written contract for not over £1,600,000 sterling, equal to less than 8 millions of dollars, while Light and Braunlees correctly estimated the Quebec structure of only one third the extent (a single span of only 1400 ft. and lesser with, against a double span or two spans of 1700 ft. and greater breadth and height) to cost \$3,000,000 ; I say, had that been known, no one would have dared on the floor of the House, deny the correctness of the lesser estimate, nor have had the barefaced audacity to put the figure down as was done at \$7,000,000 as a potent, an omnipotent argument against granting Quebec her due.

Let us hope Sir Charles will put his opinion in the scale in relation to the utility of the bridge at Quebec, of which it has been argued that it would injure the city as it was also argued at the time of building the Victoria, that it would ruin Montreal. Is such the case or is it not the contrary. Through trains of passenger and freight traffic destined for points beyond Quebec, must undoubtedly go straight through the Bridge and not stop at Quebec where they are not wanted and where the freight would only be an embarrassing nuisance on our lines and sidings ; but on the other hand, the bridge would allow of all passenger and freight traffic destined for Quebec to come straight into the City from the Maritime

Provinces by way of the Intercolonial ; from Ontario, the far West, and the United States, by way of the Grand Trunk, the Kennebec and the Canada Central ; while the same bridge would subserve the purposes of Levis or South Quebec (the other half of our City) by allowing so much of the traffic of the North Shore and Lake St. John railways as might be booked to Levis and southward, to reach its destination direct through the Quebec bridge, without, as is at present the case, having to wait for days in winter, hours in summer, to cross the St. Lawrence until a favorable opportunity may occur for so doing.

And we appear destined not even to have the advantage of ferry boats for the purpose of taking trains across the river, because forthwith no one can or has yet conceived the idea of doing away with the ice and frost difficulty as can so easily be done in my opinion by building a water tight, roofed in, wooden slip-way of suitable length for an inclined plane to let down a train of cars or portion, thereof at low water, as at any other stage of the tide, and so enclose the outer end of the slipway by a hinged vertically sliding shield or gate to keep out the water, moving up and down in water tight grooves ; built hollow (both slides and guides) and of steel or iron to admit steam or hot water and thus effectually prevent any freezing of the gate in its jams.

To return now to the more immediate subject at hand, it will be seen that not merely is the section under consideration so to say complete, but that to make up for any deficiencies, more than a hundred times the amount of all such is compensated for by the 4th section being more than half finished and in fact equal to finished if the work already done on the 5th section be put in the balance.

I would therefore recommend that the City Council do now declare the allowance of \$2,500 per mile to be due and payable and I would have it done with a good grace, for really it has been a terrible battle for the company to fight and like their indomitable engineer Cadman who was never yet once deterred by a mountain staring him straight in the face and where engineers of old would have proposed to tunnel thro, Cadman conjured the difficulty by getting round it, and in the same way the indefatigable secretary treasurer of the company J. S. Scott, esq. has had to engineer the company through its pecuniary difficulties ; It has been a hard struggle I say and had it not been for such a man as James G. Ross who came to the rescue when all others failed to do so, while other wealthy Quebecers preferred the unpatriotic mode of going to England and elsewhere to spend the money earned in Quebec and therefore due to it,

and should have been spent here ; had Ross I say not come to the rescue as he did, the undertaking would ere now have been more than once abandoned from sheer want of funds to carry it through.

Moreover there are now also on hand enough rails to lay 15 miles more of track or to the end of the 5th section at 86 miles from Quebec and some idea may be had of the number of hands now on the works, when it is stated that 1500 6lbs. loaves are baked weekly on the premises to keep the men supplied with this one article of diet.

It is really in our own interest that we should do something to facilitate and hasten the completion of this road right through to lake St. John, such for instance as taking upon ourselves at an earlier date the interest on the bonds and not keeping the company waiting for this till the road is finished.

Let us do all we can to hasten the completion of the road as Curé Lizotte has told us that some 35 parishes will spring up between the Lake and Isle Edouard and I need not dwell upon the absolute necessity of Quebec having a back country of its own as other cities have to their great and manifest advantage.

I am glad to learn that the Federal Govt. will continue its subscription to the road and it would certainly be in the general interest that this aid be increased both by the Federal and Local Govts.

With increased facilities and the good will of all, there can be no doubt as to the possibility and almost certainty of the road being completed to lake St. John early in 1888.

In former reports I have alluded to the style of engine called the "Consolidation" distributing its weight, 50 to 60 tons exclusive of tender, over the road through four pair of driving wheels and therefore not heavier on the rail in proportion than other engines, not more destructive of the road and capable of working round curves of 350 feet radius. These engines are well fitted for a road like this with 20% grades and will move a train of 20 to 30 loaded platform or other cars with as much facility as an ordinary engine will take in tow only one half the number. These engines in fact have been designed especially to meet the requirements of heavy grades as those on the Pacific railway where they are in use, as well, in the Sierras, in South America on the Santa Fe, in the hilly districts of the United States, in Russia and elsewhere, and not only can one of these fiery steeds do twice the duty of their tamer kin but they are also of far greater economy since it requires but one

engine driver, one conductor, one set of hands to work the double train, while twice the number would be required on two separate trains of half the size.

In former days we had to get through the world; now we get around and over it. In railroad times of yore, Stephenson would have never dared to try his hand at any thing but a straight and level road, with costly tunnels and embankments. There was good reason for so doing: engines were then so light of weight, their wheels must have slid upon the rails instead of rolling over them. These European railways did not cost less than £50,000 a mile, a quarter of a million of dollars on an average.

American Engineers tutored into boldness of conception by the very vastness of the country, its mountains and acclivities, have mastered the situation and introduced slopes formerly thought to be impossible; but, "diamond cut diamond" like, and as, for every heavier shot or projectile an increased armor plating can be found to protect our fleet at sea, and each addition to the plating find a heavier gun, a greater charge of powder, a more ponderous missile to overcome its resistance: so has it been with railroads, and the limit has not yet been reached at which an increased incline will not find an engine of heavier or more powerful calibre suited to the augmented gravity.

Look at our roads as compared with those of old: they cost a quarter of a million to the mile, ours one fifth of the amount: the average price of American railroads; while this of the lake St. John district bids fair to be done and equipped for hardly more than half the latter sum, may-be \$30,000 to the mile, which will seem incredible to all who may look into the vastness of the enterprise through such a wild and hilly country; but the indomitable Cadman, the company's engineer in chief is not to be deterred by such a trifle as a mountain a thousand ft. in height: he sees it at a distance, prepares for it and though you would imagine you are going to but slap up against it, you are agreeably mistaken by finding yourself skirting around its base in the most fascinating curve imaginable.

Keep at it Cadman: the Company's consulting engineer Light will not fail you, Ridout will help you through. Do not lose courage Scott—keep up your spirits Directors of the arduous undertaking. Push forward Beemer and Hoare. Better times must be in store for you all. The work must be seen to be appreciated and when seen the Corporation of Quebec can not fail, neither can the Govt. the Federal, the Local, to stretch out a helping hand to you.

Let us have Sir John again, Sir Charles, Sir Hector, Sir Adolphe the Minister of Railways, M. Pope, the Quebec Ministers to boot, to see the country for themselves, its floral and its mineral wealth, its adaptability for settlement between Lake Edouard and Chicoutimi. Let them see this but once and they can not fail to hold out the land of fellowship to the hardy pioneers on their way to Mistassini.

(Signed)

CHS. BAILLAIRGÉ, A. M.

City Engineer

F. R. S. C. etc., etc.

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