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## The Construction of the Great Northern Railway of Canada.

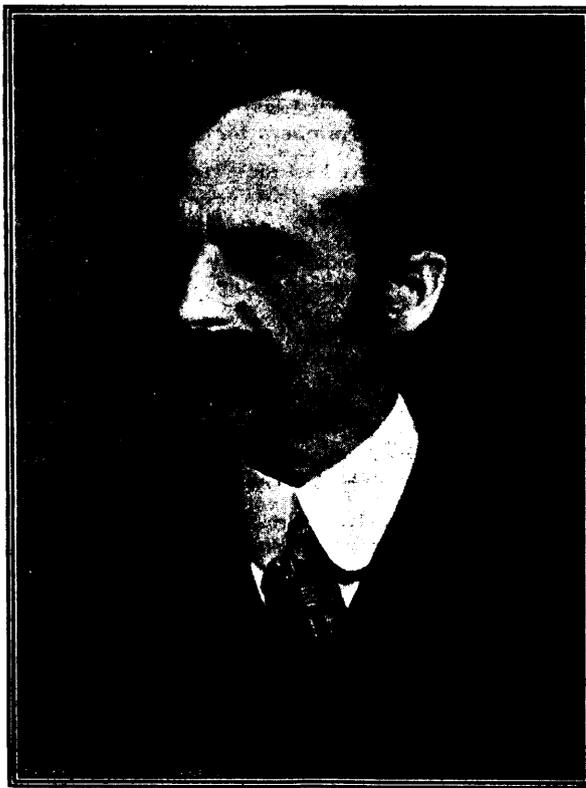
By J. M. Shanly, M. Can. Soc. C. E.

The Great Northern Ry. Co. was chartered by the Dominion Parliament in 1882—to build a railway from Quebec to some point on the Ottawa river, near Carillon, and to open up a rich section of country lying along the base of the Laurentian mountains, and at some distance to the north of the C.P.R. Construction was commenced about 1884 at St. Jerome, and was slowly pushed eastward from point to point until it reached Montcalm, a distance of 28 miles, about 1895. In the meantime the Lower Laurentian Railway had been built westward from River a Pierre—on the Quebec and Lake St. John Ry., about 58 miles from Quebec—to a junction with the Piles branch of the C.P.R., near St. Tite, about 35 miles in length. From St. Tite a section of 20 miles had been built, under the Great Northern charter, crossing the St. Maurice river at Grande Mere, to St. Boniface. In the beginning of 1899 the Great Northern Ry., therefore, consisted of two disconnected portions—the eastern one 20 miles in length, separated by a gap of 53 miles from the western one, 28 miles in length—and this western section was separated by a gap of 35 miles from its projected western terminus at Hawkesbury, Ont., where it was proposed to connect with the Canada Atlantic Ry., and thus form a link in a new line from Parry Sound to Quebec, which would bring down the produce of the Great West to the latter port, and enable it to take advantage of its fine harbour and unequalled geographical position. These two sections had been operated for local traffic—the eastern by the Quebec and Lake St. John Ry. Co., and the western by a firm of contractors who had built a portion of the line—but the latter line had been allowed to fall into bad repair, and was rapidly going to ruin. A reorganization of the Co. having taken place, and the necessary financial arrangements having been completed, in Mar. 1899, a contract was entered into with Ross, Barry & McRae, for the building of the 88 miles necessary to close the two gaps, and for the reconstruction of the 28 miles of old line between St. Jerome and Montcalm. Under this contract all plans, etc., were to be prepared in the office of E. A. Hoare, the Co.'s Chief Engineer, and all field engineering and superintendence was to be done by the contractors. J. M. McCarthy, C.E., and the writer, were employed by the contractors as their engineers, and arrangements were at once made to push on the work

of construction as soon as the spring opened. The eastern division from Montcalm to St. Boniface had been previously located and plans filed for subsidy purposes with the Government, so that the old lines had merely to be picked up and re-run. No deviations or alterations were allowed, except in one or two special cases, which proved to be quite a serious handicap to the contractors, but for which there was no help. The western division, including the bridge over the Ottawa river at Hawkesbury, had not been located, and this

yond the location of the bridge and the fixing of the number and length of the spans, so that the work of preparing plans could be gone on with. About April 25, the snow having gone down considerably, three location parties were put in the field, one under L. R. Ord, C.E., working from St. Boniface west; one under E. Lantier, C.E., working from Montcalm east, and one under A. H. N. Bruce, C.E., working from St. Jerome west. Tenders were called for clearing, grubbing, grading, etc., on the eastern division, in sections of about five miles each, and early in May the contracts were awarded—in some cases two or more sections being given to one firm. Contracts had already been let for rails, timber, the bridge superstructures, etc. The specified load for these bridges was two consolidation locomotives, with 160,000 lbs. on the drivers, followed by a train weighing 4,000 lbs. per foot. Ground was broken near Joliette within a few days, and the whole work was soon under way, and was pushed on continuously thereafter. The substructure of the main bridge at Hawkesbury was not let, though the stone was cut and supplied by contract, but this work was done by Ross, Barry & McRae themselves under the direct supervision of J. M. McCarthy. In Aug., the location of the western division having been finished, and the plans filed, contracts were awarded in the same way as those on the other divisions. About the middle of May the work of repairing the old line between St. Jerome and Montcalm was commenced. This work, which consisted of relaying a portion of the track with heavy rails, renewing ties, ballasting, rebuilding culverts and trestles, and a general overhauling, was done by the contractors themselves, with H. T. Hazen, C.E., as engineer in charge. As this line had been in operation for some time, it would have been a great hardship if it had been closed even temporarily, so the work was carried on without interrupting traffic, although this required careful manipulation, as some of the structures which were quite large had to be taken down and entirely rebuilt.

The country through which the new line passed was well settled and fairly open—a sort of rolling prairie, intersected by numerous gullies, some of which were both wide and deep. Apart from the bridging, the work was very similar to the ordinary railway work in this part of the Province. The soil was mostly a sandy loam running into clay in places, and especially towards the east end, sometimes a quicksand overlying blue clay. Embankments were called for 16 ft. in width, but were



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work was done by the contractors subject to the approval of the Co.'s Chief Engineer, the curvature being limited to 4° and the grades to 1%. The first work done after the appointment of the writer was the location of the Hawkesbury bridge—as it was important to get this done before the water rose in the spring, in order that everything should be in readiness for the work of construction during the low water period of summer, the bridge being the key of the whole undertaking. Owing to the great depth of snow no field work was done on the line at this time, be-