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## THE FIELD WORK OF THE LETHBRIDGE VIADUCT

With some Notes on the Construction of the Substructure

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IN the issue for September 17th, 1909, of *The Canadian Engineer* in an article entitled "Great Engineering Works on the Canadian Pacific Railway," the late J. E. Schwitzer, then Assistant Chief Engineer of C.P.R., western lines, dealt briefly on the construction of the Lethbridge viaduct and the spiral tunnels between Field and Hector. Subsequently, shortly after the opening of the Lethbridge viaduct for traffic, a most interesting and valuable paper was read before the Canadian Society of Civil Engineers by C. N. Monsarrat, Esq., a member of that society, now chairman of the Board of Engineers for the Quebec Bridge. This latter paper dealt chiefly with the design of the viaduct and its erection, touching briefly on the laying out of the substructure.

The author will endeavor to describe fully, the procedure adopted in connection with the laying out of the work, and the manner in which it was carried out in the field; also to describe some features of interest in connection with the construction of the foundations.

Up till 1894, the City of Lethbridge was the western terminus of a narrow gauge railway between that city and Dunmore Junction on the C.P.R. main line near Medicine Hat, then operated by the Alberta Railway and Coal Company, who, if the author remembers correctly, held the original charter for the building of the Crow's Nest Pass Railway. The Alberta Railway and Coal Company, also, before being taken over by the Canadian Pacific Railway, made extensive surveys to effect a crossing over the Belly River in the neighborhood of where the Lethbridge viaduct now stands.

The narrow gauge railway between Dunmore Jct. and Lethbridge was finally bought out by the C.P.R. and standardized, and the Crow's Nest Pass branch was built by them during 1897 and 1898, connecting Medicine Hat, on the main line, with Kootenay Landing, on the south

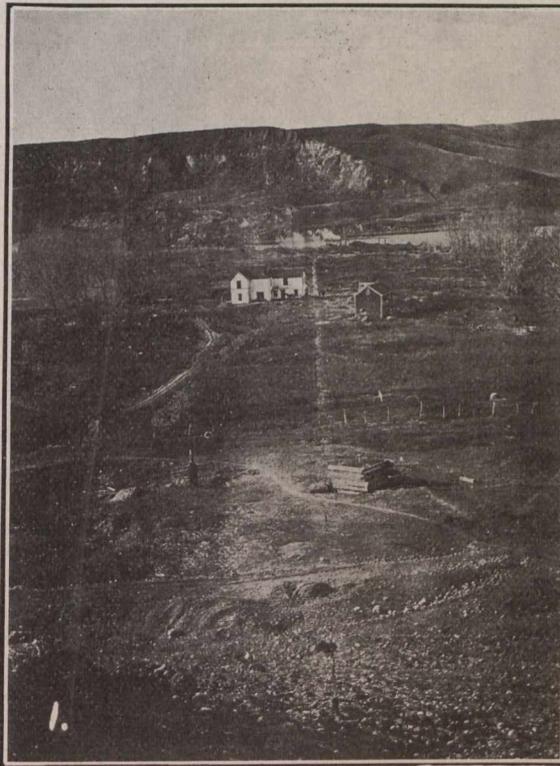


Fig. 1.—Site of the Viaduct Looking West.

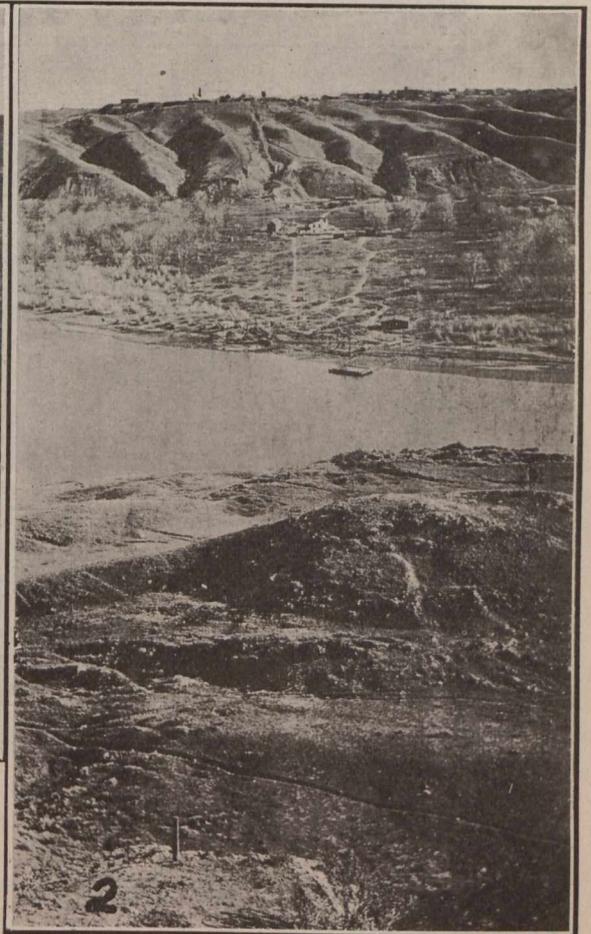


Fig. 2.—Site Looking East.

end of Kootenay Lake. The Lethbridge-Macleod cut-off is a portion, approximately  $31\frac{3}{4}$  mi. long, of the Crow's Nest Pass Branch of the Canadian Pacific Railway which was opened for traffic on November 1st, 1909.

The old line between Lethbridge and Macleod, which was built during 1897 and 1898, was approximately 37 mi. long and included, besides very heavy earthwork, the construction of some 20 trestles and bridges, containing approximately 15,000,000 ft. B.M. of timber. Only two streams were crossed, and these with low-level crossings,