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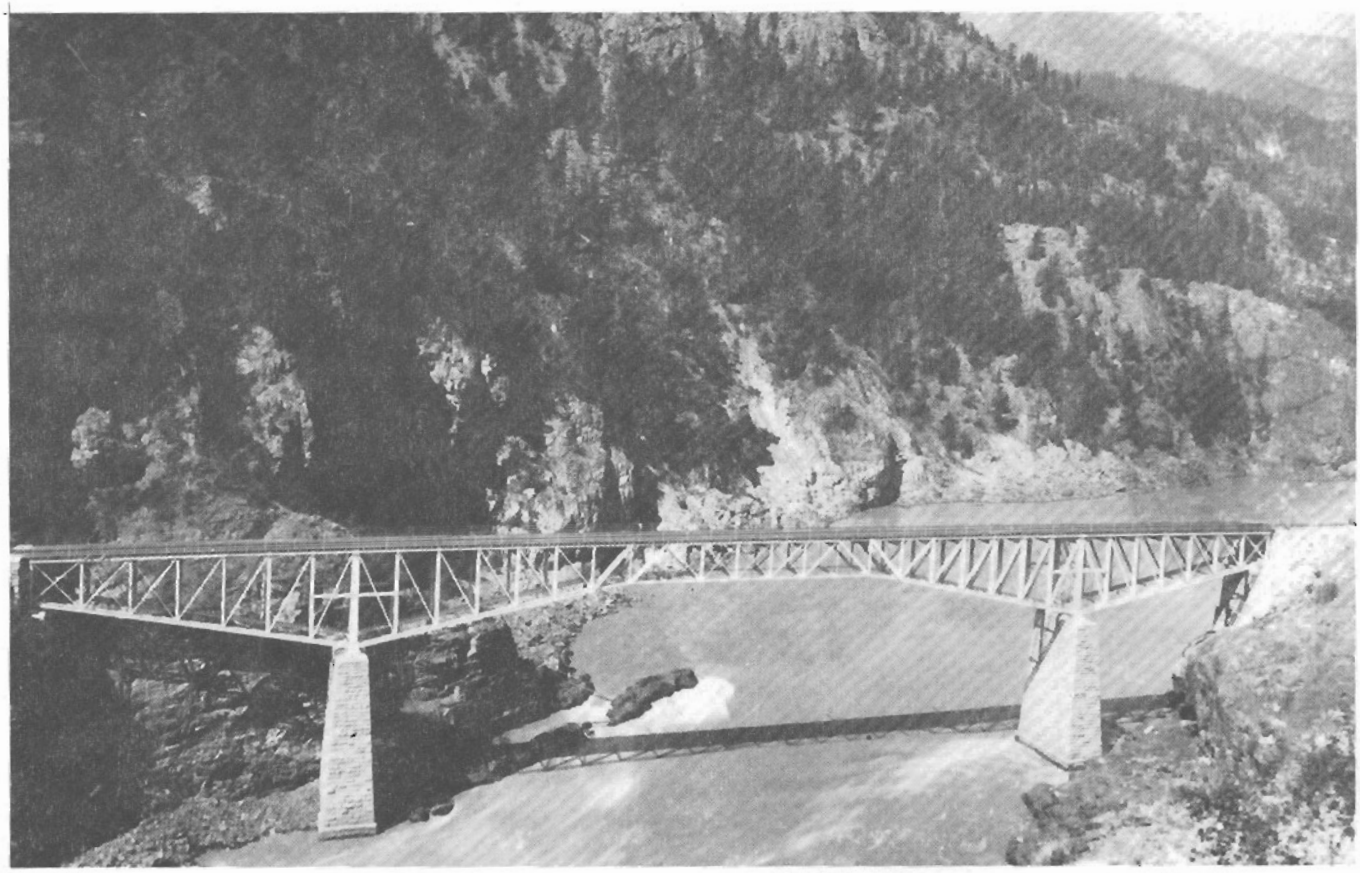

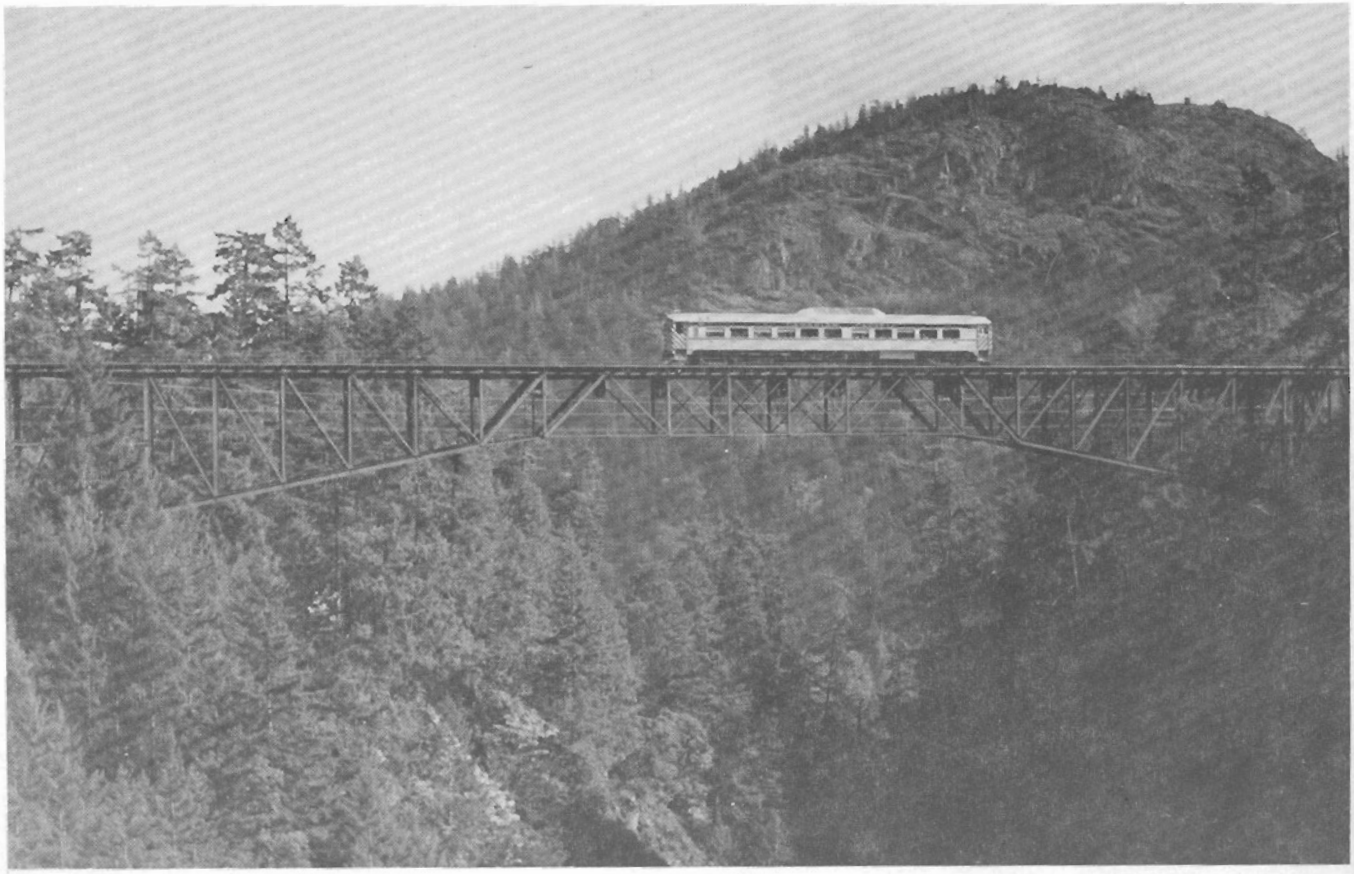

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FRONT COVER:

BACK IN 1948 one of the main exhibits at the International Trade Fair, held in Toronto, was the first production diesel locomotive built in Canada; C.P.R. No. 7077 then newly completed by Montreal Locomotive Works. Thirty-six years later this historic locomotive was retired and has now been preserved at the Canadian Railway Museum at Delson / St. Constant.

Canadian Pacific photo.

INSIDE FRONT COVER:

The original C.P.R. steel bridge across the Fraser River at Cisco B.C. as photographed about 1900. The lower photo taken around 1955 shows the bridge as re-located to its present position. Credit top photo C.P. Corporate Archives, lower photo Omer Lavallee collection.

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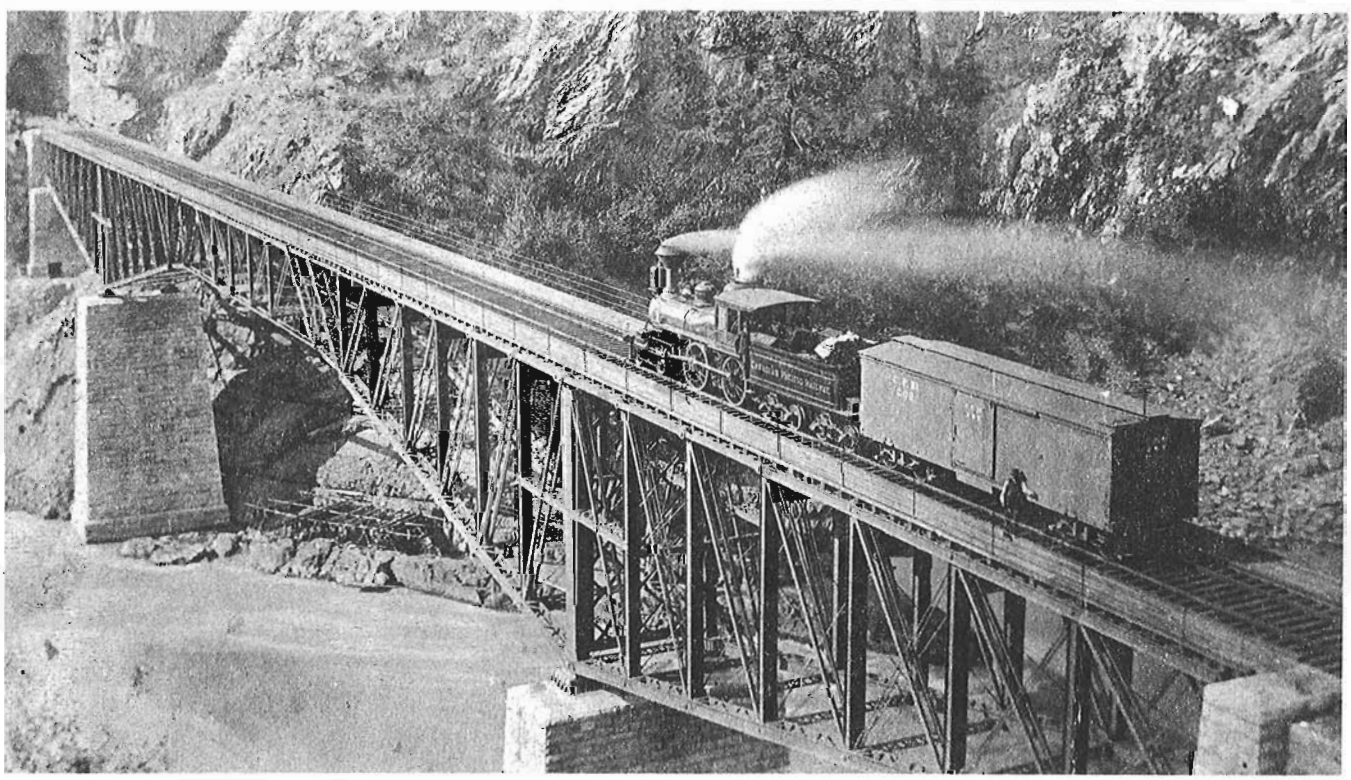
The Great Cantilever Bridge One Hundred Years Later

by Michael Batten

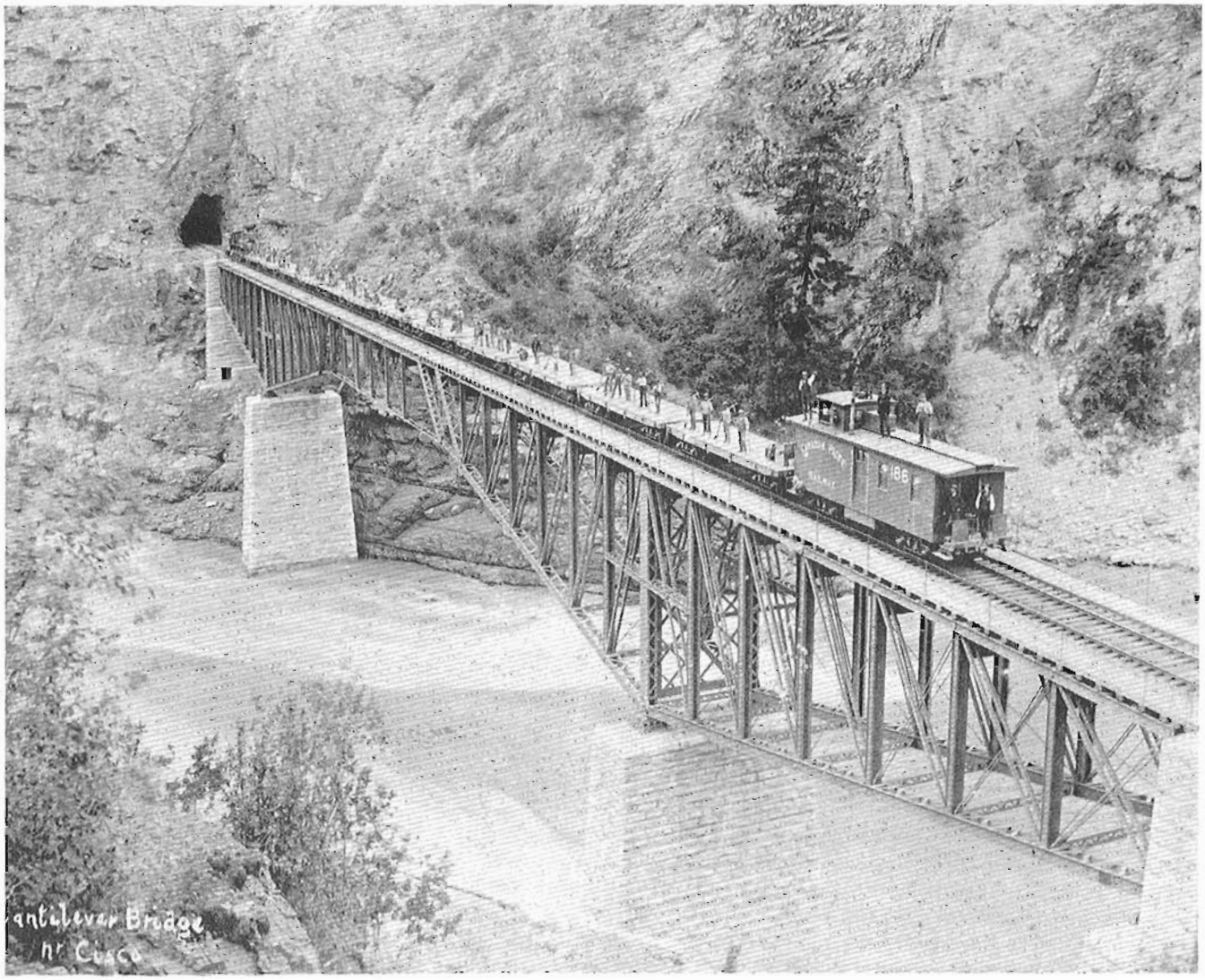
Vancouver Island's Esquimalt and Nanaimo Railway is perhaps best known to railfans for the longevity of its unique Canadian fleet of Baldwin DRS44-10 road-switchers, and, more recently, for the successful fight by local residents to save its passenger services. Among the general public, the E&N is renowned for the beautiful scenery along the line, particularly over the ridge of mountains north of Victoria known as the Malahat. Especially impressive is the railway's crossing of Niagara Canyon at mileage 14.0 from Victoria. Today, nearly a century after the railway was opened, the dizzying transit of this deep gully, 260 feet above the streambed, is still a scenic highlight of the train trip from Victoria to Courtenay. But although the view and the scenery are magnificent, the bridge carrying the line across the canyon is also worthy of note. Now in its second location, the bridge was, when opened at its original site one hundred years ago, one of the most imposing engineering works on the Canadian Pacific Railway's transcontinental main line. The bridges's subsequent history provides some interesting footnotes to that of the Esquimalt and Nanaimo Railway.

Niagara Canyon was first bridged in the summer of 1885 two years after the syndicate headed by Robert Dunsmuir had secured the contract to build and operate a line of railway between Victoria and Nanaimo. Clearing of the right-of-way began at the northern end of the route in the fall of 1884, and in February, 1885, A.J. McLellan was awarded the contract to prepare approximately 22 miles of right-of-way from Esquimalt to Cliffside, above the shore of Shawnigan Lake. Work proceeded rapidly on this, the most difficult part of the entire undertaking. According to a report in the Victoria newspaper, the Daily British Col-



THE "GREAT CANTILEVER BRIDGE" at its first location at Cisco in the Fraser Canyon. One of Andrew Onderdonk's locomotives pulls a single car over the bridge soon after the structure was completed.

Photo: Provincial Archives of B.C. C-5233.



LOOKING DOWN ON THE CISCO BRIDGE in 1886, soon after it was taken over by the C.P.R. Company, we see an empty ballast train pushed by an early C.P. 4-4-0.
Photo: J.A. Brock and Company.

onist, of May 19, 1885, a five-mile subcontract, consisting "principally of rockwork, the hardest piece on the whole McLellan contract," was already completed for one mile, ready to receive track. On August 13, 1885 (exactly one year before the entire line to Nanaimo was completed), the same paper reported that this subcontract would "all be finished by the first of October." In fact, the McLellan contract in its entirity was completed by the end of September, according to McLellan's daughter Winifred; in a letter written in 1971 she recalls the "seven month contract of the Malahat which my father had." In those seven months, 1,050 men had, in the course of building 22 miles of grade, blasted through five miles of heavy rockwork, drilled a short tunnel, and bridged several gullies and canyons, including Niagara Canyon.

This first Niagara Canyon bridge was one of many wooden trestles on the line over the Malahat, albeit one of the larger ones. The intricate construction, so typical of these trestles, consumed 400,000 board feet of timber and carried the railway 235 feet above the bed of Niagara Creek. Impressive as this bridge was, it was assumed by many that it would be replaced by more permanent steel structure, according to normal practice, as soon as time and money permitted. However, the

THE ORIGINAL TRESTLE AT NIAGARA CANYON, probably in the late 1880's or early 1890's, with a southbound train headed by E. & N. locomotive number 3.
Photo: Provincial Archives of B.C. D-3975.

Niagara Canyon trestle remained in use for nearly thirty years after its construction, due mainly to the financial and engineering difficulties associated with its replacement. The bridge was located a few hundred feet up the canyon from the present crossing and was on a curve, the original track alignment being slightly different from that of today. Indeed, one can still see the rock cutting through which the tracks were brought to the trestle-- even the impressions of the ties remain in the ground-- although all traces of the bridge itself have vanished.

In November, 1896, the centre section of the Niagara Canyon trestle was washed out in heavy rains. According to newspaper accounts, the E&N considered replacing the wooden structure with a steel bridge, but this was apparently beyond the company's means; the damaged section was simply rebuilt. However, in 1905 the E&N was purchased from the Dunsmuir family by the Canadian Pacific Railway., which within two years began an extensive programme to improve and extend the Island line. For many years, improvement followed improvement as the E&N developed into

a busy, well-maintained network of over 200 miles.

The first of many projects, however, was the strengthening of the line over the Malahat, to enable heavier trains to be operated. This was something awaited eagerly by both the business community and the general public at a time when the railway was the only quick and efficient means of transport along the Island's east coast. Heavier rail was procured, and many of the trestles were filled in. The Niagara Canyon trestle, like that a mile north at Arbutus Canyon, was simply too high to be filled, and therefore a major expenditure would be needed to bring the crossing up to the standard of the rest of the line.

On April 23, 1909, the Daily Colonist announced that the C.P.R. would spend about $120,000 to install "a new cantilever steel bridge over Niagara canyon." Work on the piers and abutments would begin immediately, it was reported, and it was hoped that the bridge would be finished by the end of the year. By the end of February, 1910, however, the Colonist reported that the railway had only "engaged in preliminary operations." The abutments of the present bridge are dated 1910, so it is obvious that part of the work was underway by that year. It was not until October 27, 1911, that the Colonist informed its readers that the new steel bridge at Niagara Canyon was expected to be ready for traffic within two weeks. Furthermore, although it was referred to as such, the bridge was not really "new" at all, but actually older than the Esquimalt and Nanimo Railway itself, dating from the time of the construction of the C.P.R. in British Colombia.

When Andrew Onderdonk's engineers began in 1880 to push the C.P.R. through the forbidding Fraser and Thompson canyons of B.C.'s interior, they quickly realized that although they might be able to scrimp and save on almost every other aspect of the work, they would have to produce a first-class structure to get the line across the Fraser River at Cisco, 47.8 miles north of Yale. The crossing was 525 feet long, and over a hundred feet above the fast-moving river. The fluctuations in water level, as well as the speed of the current, meant that a trestle was out of the question. The conditions of the site made a cantilever bridge the most suitable for the crossing. Carried on stone piers well above the high-water mark and able to support itself over the 315-foot clear span, it would be an impressive bridge, to deal with an impressive engineering challenge. The only other steel cantilever bridge of a similar design then in use in North America was one carrying the Michigan Central Railroad over the Niagara River between Ontario and New York. The relatively isolated location of the C.P.R. span, however, presented construction difficulties not encountered in southern Ontario, thus the erection of the Cisco bridge, as it came to be called, would be

THE LETTERHEAD OF THE SAN FRANCISCO BRIDGE COMPANY showing the famous Cisco bridge. This was printed in 1884 the year the bridge was built.
Canadian Pacific Corporate Archives.

something of a pioneer operation. The bridge cost well over a quarter of a million dollars, making it the most expensive structure on the C.P.R.'s mainline. For all these reasons, the "Great Cantilever Bridge" aroused a great deal of interest among the residents of the Fraser Vallet and Vancouver Island, and its construction was followed closely in the papers of the day.

The steel for the bridge was prefabricated in Newcastle, England, and shipped round the Horn to San Francisco, whence it was forwarded north to Port Moody by the San Francisco Bridge Company, who were responsible for its final assembly. Such was the prestige of the job that the company later embellished its letterhead with an engraving showing the bridge carrying a train high above the Fraser. On January 1, 1884, the Colonist reported that the steel was at Port Moody, ready for shipment by rail to the crossing site. By the end of February, the steel was on site and construction begun under the direction of the contractor, John McMullen.

The job was a large one, and a sizeable if rather ramshackle and disorderly settlement soon grew up around the construction site, acquiring the character of a semi-permanent work camp. The community was loosely referred to as 50-Mile Post or 50-Mile Crossing, it being approximately fifty miles north of the large town of Yale. At least one shipping and forwarding business--Kimball & Gladwin's--opened an office at 50-Mile to complement its "head" office in Yale, in order to take advantage of the large if somewhat transient population. Such a community could hardly be described as genteel--a characteristic it shared with most railway construction camps--and on April 3, the Colonist carried the following report from Yale Sentinel of March 27:

> We are credibly informed that a very disorderly state of things has existed for some time past in the vicinity of the 50-Mile Post. Now that a large force of workmen are employed at and near the Iron Bridge Crossing--50-Mile Post--it is necessary that those entrusted with maintaining good order and enforcing the law would give proper attention to the enforcement of the law and thereby check drunkeness and crime. It is hoped that the recent prompt action upon the part of the authorities at Lytton, and Judge Elliot, S.M., will have a good effect along the line, especially at and near the 50-Mile Post.

However roudy they may have been, the labourers appear to have confined their carousing to their leisure time, and the construction proceeded fairly quickly. There were two reasons for haste: first, the falsework for the bridge had to be removed before the river level rose with the spring thaw; and second, as long as the bridge remained unfinished, no track could be laid above the crossing.

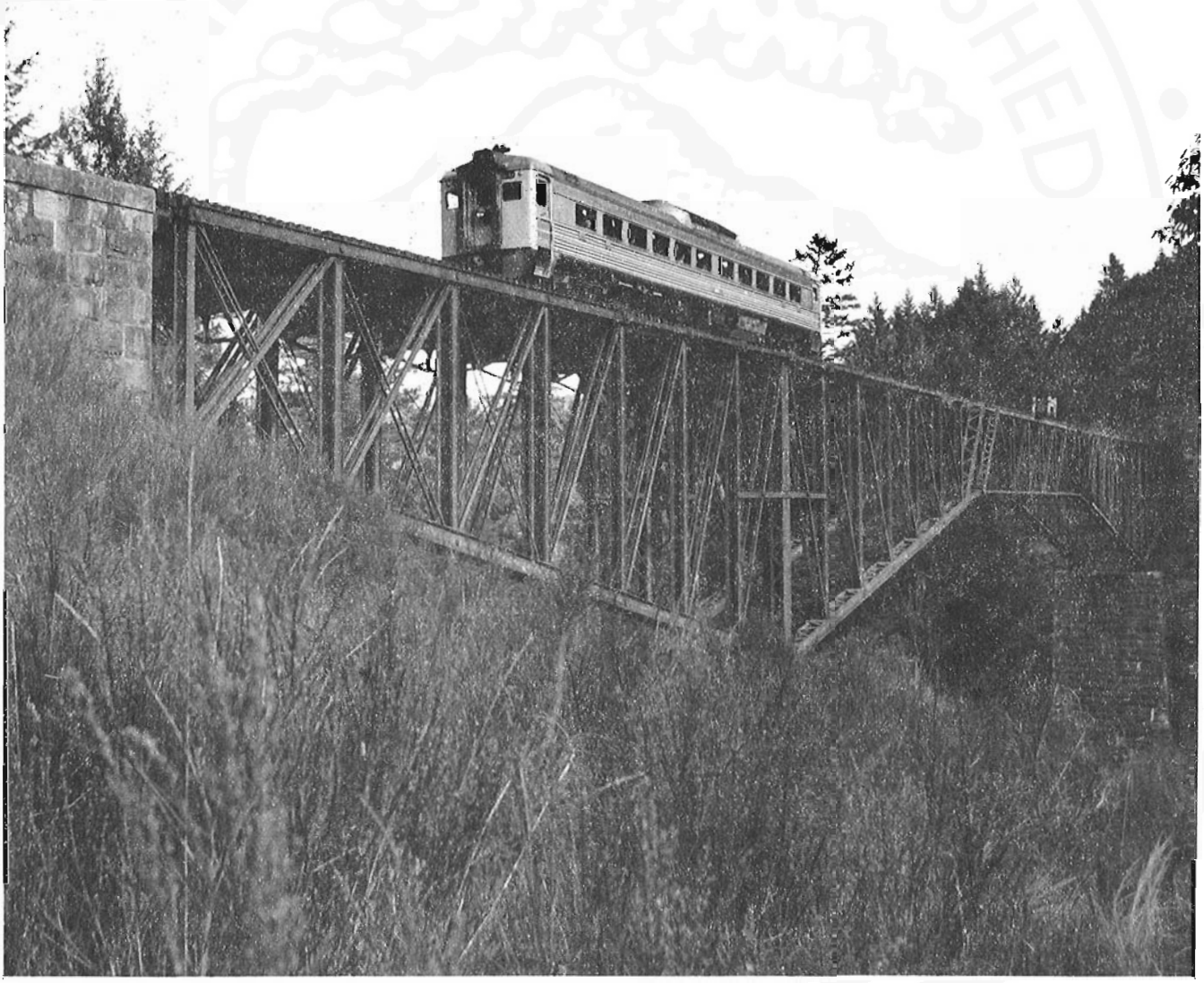
By late spring, 1884, all was complete, and on Thursday, June 12, the bridge was opened. As far as was possible in the middle of nowhere, the event was a gala occasion. In attendance was Andrew Onderdonk himself, and people came to the celebration from Victoria, New Westminster, and Yale by means of that eminently Victorian institution, the Large Party of Excursionists. One Judge Walkem made the inevitable speech, which the Colonist, also rather inevitably, said was " able and felicitous." The Large Party of Excursionists clattered back and forth across the bridge on a string of open flat cars, and, satisfied at having performed their civic duty, went happily home.

Despite its auspicious opening, the cantilever bridge remained in use on the main line for less than thirty years. By the early years of this century, the bridge that had been the most impressive in B.C. was no longer adequate for the increasing weight of the C.P.R.'s main line trains. It is not known exactly when the bridge was removed from the Cisco crossing, but the fact that the E&N was able to announce in 1909 that the wooden trestle over Niagara Canyon would be replaced by a cantilever bridge suggests that by that date the C.P.R. had already earmarked the bridge for use on Vancouver Island, although its installation was not complete until the end of 1911.

It is interesting, and rather frustrating for the researcher, to note that although the bridge's installation in 1884 was accorded ample press coverage, its relocation in 1911 received little attention. In the context of Island railway news, it was simply overwhelmed by the flood of developments that year. The E&N was about to open its line to Port Alberni, work was continuing apace on the B.C. Electric Railway's interurban line from Victoria to Deep Cove, and construction was getting underway on the Canadian Northern Pacific's projected line from Patricia Bay through Victoria, Sooke, and the Cowchan Valley to Port Alberni. Perhaps another explanation for the lack of coverage of the "new" bridge is that the Island papers felt affronted that the C.P.R. was giving the Island a secondhand cast-off from the previous century instead of the shiny new bridge such a prosperous and developing area so obviously deserved.

Today, the Niagara Canyon bridge, although reinforced in 1940 to accomodate the heavier D-10

Ten-Wheelers which were assigned to the E&N that year, is little changed from its configuration of a hundred years ago, and is quite capable of handling the relatively light loads on the E&N. The "Great Cantilever Bridge" no longer impresses us with its size, but with its interesting history and graceful appearance. It is ironic that the Esquimalt and Nanaimo Railway was originally built to placate the residents of Vancouver Island when they learnt that Port Moody, and not Esquimalt, would be the western terminus of the C.P.R. A century later, the E&N is part of the C.P. system, and a bridge from the original transcontinental line has been put to good use on Vancouver Island. Thanks to a quirk of history, and the frugality of the Canadian Pacific Railway, it is still possible to ride over the bridge that was once the marvel of British Columbia.



VIA TRAIN 198, consisting of RDC-1 No. 6134 crosses the "Great Cantilever Bridge" at Niagara Canyon in April 1984.

Photo: Michael Batten.