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## **FRONT COVER**

The westbound CPR "Pacific Express" with 4-4-0 395, at Field, B.C., after having descended the "Big Hill." Mount Stephen House, the CPR hotel and restaurant, is to the right.

—Calgary Herald photo, 1898;  
from the Glenbow Museum;  
forwarded by John Moseley.

# THE ORIGINAL RAILWAY LINE THROUGH THE KICKING HORSE PASS CANADIAN PACIFIC'S "BIG HILL"

BY JOHN MOSELEY

I realise that much material has been published on the Canadian Pacific Railway's surveys, construction, and operation through the Rocky Mountains, but a recent auto trip there stirred me to thoughts and visions about its history. So I decided I should pen a few lines about the challenge of traversing the Rocky Mountains by the first railway line.

The most fascinating part of the CPR line is where it passes through the Waputik Range, the westernmost range of the Rocky Mountains. The Continental Divide crawls along the spine of this range, and its ruggedness has created more of almost everything in railway engineering. The point where the CPR line crosses through this range and over the Continental Divide is the Kicking Horse Pass.

The original proposal for the first railway line from central Canada to the west coast was via Yellowhead Pass, far to the north. This route is now used by Canadian National for its passage through the Rockies.

While much speculation abounds, there appears little in the way of recorded facts for the reasons why Messrs. G. Stephen, R.B. Angus, and J.J. Hill chose the more southerly, but definitely more difficult, route via the Kicking Horse River in their race to the Pacific. Late in 1881, the CPR requested Parliament to amend the CPR legislation to permit them to follow a more southerly route. Parliamentary records make reference to the shorter distance and the ability of the southern route to prevent American intrusion into Canadian territory as two reasons for its selection, but are these the main reasons?

When viewed from the perspective of the state of technology, the building of this portion of railway in the 1880s is probably the greatest single engineering feat in Canadian history. A visit to the Kicking Horse Pass today, while still impressive, tends to lose some of its true perspective unless you remind yourself of the facts of the scope and methods available for construction at that time. Building the line across the Canadian Shield along the north shore of Lake Superior presented many obstacles to the railway and their contractors, but when compared to the undertaking in the west, they hardly worked up a sweat. Conquering the Kicking Horse Pass is a prime example of the efforts of our forefathers to lay a ribbon of iron from coast to coast.

The need to keep down expenses and to finish the railway route as quickly as possible meant that such expensive and time-consuming work as tunnelling had to be kept to a minimum. Government specifications stated that the main line was to have a maximum grade of 2.2 percent (a vertical rise or fall of 116 feet per mile of track, or one foot in about 45 feet). The westward climb along the Bow River toward the summit of the Kicking Horse Pass did not create any major construction problems, but it did create some comedy.

Preliminary surveys proposed a tunnel about half a mile long through a mountain near Banff, and the mountain was therefore named Tunnel Mountain. In the summer of 1883, W.C. Van Horne visited the area and was shown this preliminary plan. His reaction was immediate and volatile — he insisted that the offending mountain be removed! But the final routing

avoided both the offending mountain and the lengthy tunnel. The route was around Tunnel Mountain by way of Devil's Head Creek, which also shortened the line and avoided the heavy grades that the original route would have needed.

The proposed station at the summit would be called Stephen. The slope west of Stephen created the real problems. Major Rogers' surveys determined that while it was approximately nine miles (as the crow flies) between Stephen and Field, the vertical drop was 1250 feet. Under ideal conditions, with a uniform descent of 2.2 percent, it would require 10.75 miles of track. Of course nature is never ideal, so Hector, two miles west on the edge of Wapta Lake, was only 106 feet lower than Stephen. Major Rogers designed a route down the Kicking Horse River that would comply with the specifications, but would require a tunnel 1400 feet long, as well as locating sections of the roadbed dangerously close to an adjacent glacier.

This led the hard-nosed railway officers to look for alternatives. The favoured conclusion was for a temporary route along the upper Kicking Horse River from Hector to Field, a route known as the famous and notorious "Big Hill."

Based on the suggestion of Sanford Fleming, CPR president W.C. Van Horne obtained government approval to use a grade of 4.4 percent (one foot in about 23 feet) for the descent to Field. His argument for this concession was the line would have only three or four trains per day for many years, there was no local traffic, and most of the heavy trains would be westbound.

This construction was meant to be a temporary measure, but in point of fact it was to be a feature which would last for almost twenty-five years, until September 1909.

The Big Hill, as constructed, consisted of two steep portions with 4.4 percent grades and a relatively level segment between. The first grade, west of Hector, was four miles long, and the second one, nearer to Field, was almost as long. Most agree that this temporary measure led to this section being the most difficult and expensive to maintain on the whole CPR system.

Special crews were employed to move trains up or down the hill. The locomotives and crews left trains from the east would move down the hill independent of the rest of their train. Train speeds on the hill were extremely slow for safety reasons. Passenger trains ran at eight miles per hour, and freight trains, six miles per hour. The challenge of the Big Hill is well documented as part of the 1901 Royal Visit by the Duke and Duchess of York. Canadian Pacific used five locomotives to pull the nine car especially-built Royal Train up the hill, including the day coach *Cornwall* and night coach *York*.

The time and cost to move trains over the rugged terrain on the Big Hill and through some of the adjacent mountain ranges required cutting train weight everywhere possible. This had a very interesting spin-off: the elimination of dining cars and the establishment of way-side dining facilities. In 1886, the CPR started construction on three way-side dining facilities including Mount Stephen House at Field, B.C., the western foot of the Big Hill. The other two were Glacier House at Glacier, B.C., and Fraser Canyon House at North Bend, B.C.

These "Houses" all had a few bedrooms, but were mainly designed to offer a pleasant restaurant or dining room for the pleasure of the train travellers. The timetable for 1892 indicated



that the westbound transcontinental train stopped at Field for a 10:00 a.m. breakfast. The eastbound permitted a 30 minute stop for supper at 7:20 p.m. A year later, both trains made a dinner stop there. The eastbound arrived at 12:50 p.m. for a 25 minute stop, while the westbound made a similar stop at 2:45 p.m.

While these public timetables make no further reference to dining at Field, one might wonder if the practice of telegraphing ahead had yet been put to use. With this procedure, menus were circulated several stops ahead of the dining stop. A steward would take meal orders and drop them off at a station, where they would be telegraphed ahead. Then the restaurant would have the meals ready upon the train's arrival.

After the First World War, Mount Stephen House was taken over by the YMCA, then torn down in 1954.

My trip made me realise that not all has been progress since 1886. Today, there is no transcontinental passenger rail service in Field, and not even a cafeteria. I had to purchase a hot drink (which was charitably called coffee) at the local filling station along with a greasy sausage roll, heated in a microwave oven. There is little physical evidence today to remind a traveller that Field was once a thriving railway town.

Before any train went down the hill, all brakes and sanding equipment were tested, and the low speed limit was vigorously enforced. Trains took on extra brakemen for the trip down the hill. They would walk along the top of the freight cars tightening up the brakes with special wooden clubs. They would drop to the ground to check that the wheels were not sliding and that the bearings were not overheating. The arrival of westbound trains in Field always meant a string of cars with smoking brake shoes.

Elaborate safety measures were introduced on the Big Hill to deal with any potential runaway trains on the steep gradient. Three emergency exits were built at intervals along the route, each of them leading steeply uphill so that even a fast runaway train could be brought to a halt. The switches for these exits were manned twenty-four hours a day, and were always lined into the exit, unless the engineer of an approaching train sounded the proper signal.

W. Kaye Lamb, in his book *History of the Canadian Pacific Railway*, states that since CP's records indicate no loss of locomotives in the mountain region during the period of constructing the Big Hill, then there has to be some question about many of the Big Hill stories. Mr. Lamb considers that many of the hair-raising stories about runaway trains, etc., have been embellished by many of the old timers to impress gullible travellers. Whether the stories are totally fact or fiction, railway travel on the hill must have been a white-knuckle experience for many of the travellers, although there is no evidence of any fare-paying passenger ever being killed or injured while travelling over the Big Hill.

Regardless of Mr. Lamb's findings, it is probably worth remembering at least some of the Big Hill incidents for their folklore value. Perhaps the most unusual incident, in which no one was injured, happened to a locomotive bringing a caboose and its crew down the hill. The crew of the locomotive, new to the job, lost control of their charge on its downhill charge, so even though they had "tied down" the brake on the tender and put the locomotive drivers into reverse, they were still fearful enough to jump off in search of safety. The conductor seeing this, tried to save his caboose (and therefore himself) by uncoupling it from the engine and then tried to stop it or slow

it down using the handbrake.

The watchman on the safety switch, not hearing the proper signal from the approaching train, allowed the wayward engine (with its driving wheels still in reverse) to head up the safety exit. When the engine got near the end of the safety exit, the engine lost its forward momentum and, with the wheels still in reverse, was soon in motion again down the grade of the safety track towards the switch. When the crew on the slow-moving caboose saw the engine rolling back toward them, they jumped off. The resulting collision completely demolished the caboose. Stories of incidents such as this were by no means unusual.

The Big Hill was abandoned immediately after the opening of the new line and the Spiral Tunnels in September 1909. Several decades later part of the roadbed was incorporated into the Trans-Canada Highway.

The western half of the Big Hill route now runs approximately 300 to 500 feet south of the Trans-Canada Highway and also south of the present railway line, but is generally well hidden from the highway by trees. An all-weather gravel service road enables CP work crews to get to the site of any problem (such as a landslide) along the main line just east of Field. Another unmarked road leads from the Trans-Canada Highway to the service road and the railway line of the Big Hill in the area between the present crossing of the Trans-Canada highway near Yoho and the upper portal.

Evidence of the old safety exits can be found only with care and a sharp look-out because of the heavy growth. Near one of the safety exits, in the area of the upper tunnel, the remains of a narrow gauge engine is lying on its left side with the boiler facing west. The wheels, connecting rods and outside cylinders have disappeared, so it is not possible to see what the wheel arrangement might have been. I understand the engine was abandoned by a railway contractor following the construction of the Spiral Tunnels.

There is a look-out point for motorists on the north side of the Trans-Canada highway near Yoho to observe the spectacular scenery, the passage of trains through the Spiral Tunnels, and for those of us so inclined, to reminisce back to the days when travel through this area was not much more than man's muscle power against nature.

A plaque at the look-out is somewhat misleading. It states that the Trans-Canada Highway covers the original railway route up the Big Hill. This is not totally accurate. The lower portion, as mentioned above, is now the CPR service road. It is only the upper portion, east from about the highway look-out, towards the pass, where the Trans-Canada occupies the alignment of the original Big Hill railway line.

This unique site in Canadian railway history merits the best part of a day to examine its many interesting physical features, as well as to realise their massiveness and impact on railway operations. When remembering the size and power of the early steam locomotives in comparison, one is in awe of the efforts used on this obstacle in the early days.

Railway enthusiasts visiting the area should dress for the occasion. Remember, you are at high altitude, and sudden drops in temperature and occasional rain showers can be a common part of the daily weather. If you are going to explore the area, such as the remains of the emergency exits, ensure that you have your stout boots and long pants. It is also worth carrying an emergency snack. This is a great area and one that will definitely remind you of the changes in railroading. ■