

Canadian Rail

THE JOURNAL OF CANADA'S RAILWAY HISTORY

No. 448



SEPTEMBER - OCTOBER 1995



PUBLISHED BI-MONTHLY BY THE CANADIAN RAILROAD HISTORICAL ASSOCIATION

PUBLIE TOUS LES DEUX MOIS PAR L'ASSOCIATION CANADIENNE D'HISTOIRE FERROVIAIRE



CANADIAN RAIL

ISSN 0008-4875



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FRONT COVER: VIA train No. 83, hauled by locomotive 6512 and bound for London, crossing the bridge at St. Mary's, Ontario.

Photo by Bill Thomson.

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 Printing: Procel Printing

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In Canada: \$31 (including GST).

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As part of its activities, the CRHA operates the Canadian Railway Museum at Delson / St. Constant, Que. which is about 14 miles (23 Km.) from downtown Montreal. It is open from late May to early October (daily until Labour Day). Members, and their immediate families, are admitted free of charge.

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The Birney Safety Car

Eightieth Anniversary

1915 - 1995

By Richard M. Binns

The following article was written by the late Richard M. Binns in 1975 and was found among his papers following his death in 1988. His collection of photos, and other material concerning street cars, was kindly donated to the C.R.H.A. by his daughter. Evidently this history was prepared for Canadian Rail but for some reason was never printed. In view of this year being the 80th anniversary of the development of the Birney Car, we are publishing it now. Some extra photos have been added, and a few chronological references have been brought up to date, but otherwise the article is exactly as written by Mr. Binns.

During the electric street railway era in North America perhaps one of the most important turning points in street car design was the development of the so-called Birney Safety Car. In Canada these cars were to be found in several cities at one time or another, but it was in Halifax that they flourished in greatest numbers. In fact for twenty-two years - 1927 to 1949 - they supplied the entire tramway service in Halifax, reaching a wartime total of eighty-two units, carrying over thirty-one million passengers annually. Being so much a part of the city's life in years past, the cars are well remembered by those Haligonians who are in the infamous "over fifty" age group.

The Birney Safety Car was born in the United States in 1915, just eighty years ago. In keeping with the current fashion of marking anniversaries of all kinds, it might be timely to examine this development in street railway rolling stock and review briefly the circumstances leading up to the Birney concept.

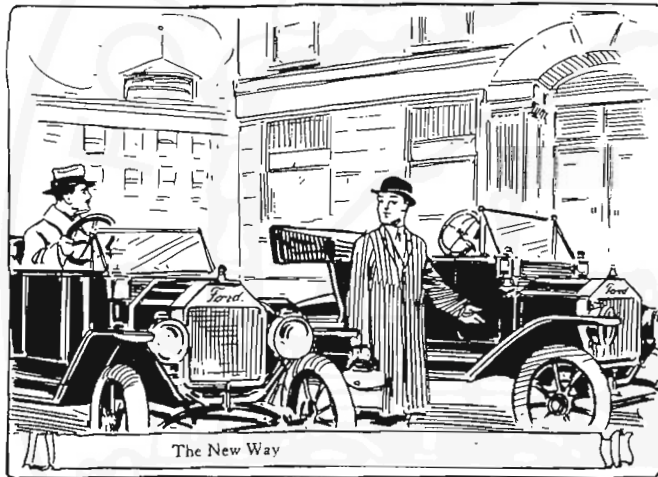
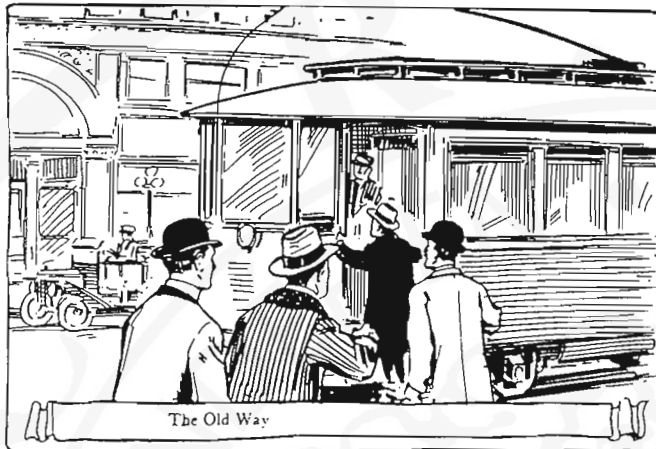
From the beginning of urban electric traction in the 1890s until World War I, street railways had, generally speaking, enjoyed continual expansion and prosperity. Indeed this cheap and rapid mode of city travel was largely responsible for the creation of large metropolitan centres. Aside from a brief flurry of competition from the bicycle around 1900, the electric street car reigned supreme in North American cities for over twenty years. Around the beginning of the First World War, however, street railway managements were starting to feel the effects of some disturbing trends. Not only were operating expenses rising steadily, especially wages of motormen and conductors; but people were beginning to desert the street cars for those exciting vehicles pouring off Henry Ford's assembly lines. The most alarming manifestation of the coming automobile age, however, was a particularly vicious type of competition from so-called jitneys, which first appeared on the streets of Los Angeles in July 1914.

The Jitney technique was simple and ruthless: - enterprising owners of almost any kind of motor vehicle, be it fender-flapping flivver or shabby old limousine, would cruise along major street car routes offering rides - at the customary five cent car fare - to

people waiting at the car stops. Rush hours offered the best pickings. A flock of these opportunists would shuttle back and forth over the busiest section of a route, stealing an appreciable amount of street car revenue. Jitneys spread with astonishing speed. By early 1915 some seven hundred infested Los Angeles alone. Soon they were skimming the cream from car lines in mid-western and eastern United States cities and, to a much lesser degree, to a few Canadian centres. Street car companies, of course, raised a howl of protest, claiming Jitneys kept no schedules, met no safety standards, and assumed no responsibility - as did the railways - for service in off-hours or in outlying districts. Sympathy for the company was often hard to arouse, in part perhaps because of the American love of free enterprise, but all too often there was dissatisfaction with the street car service and long-standing disputes over municipal franchise obligations.

Admittedly, street cars were slow, uncomfortable, and overcrowded in rush hours, and often operated in an arbitrary manner typical of a public utility without competition. Clearly, the street railway industry needed a better image and improved operating methods.

Among those pondering the situation - particularly the jitney menace - was Charles O. Birney, rolling stock engineer for the Stone and Webster organization of Boston, a firm of public utility consultants which operated and managed a number of street railway properties in Texas, Washington and elsewhere in the United States. Obviously a way must be found to provide a more rapid and frequent service without incurring too much additional expense. To this end Birney envisioned a small, agile, extremely light-weight car that could be run at low cost with a one-man crew. After some experimenting in collaboration with car builders and equipment manufacturers, a design was developed, in 1915, embodying these features. In all fairness, other transit engineers, notably J.M. Rosenbury of the Illinois Traction System, and certain car builders had been thinking along similar lines and a few lightweight models had been produced. But it was the Birney design that prevailed.



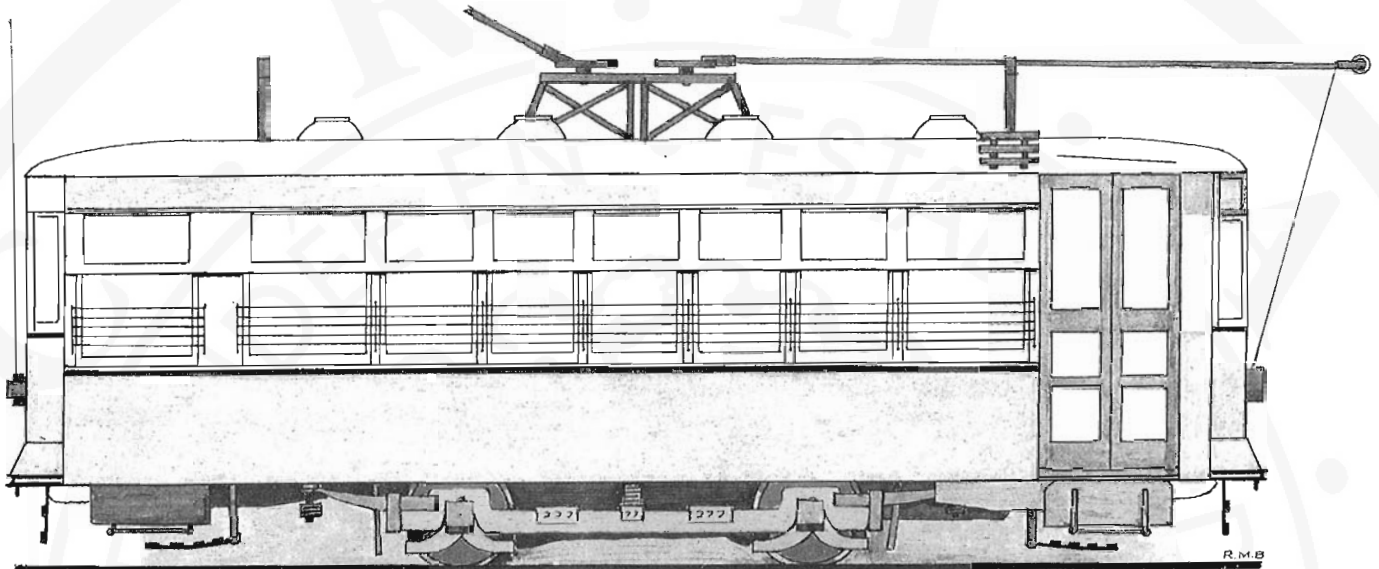
THE PROBLEM: With the development of the automobile, more and more riders deserted the street cars for this new means of transportation. This was especially so after 1913, when Henry Ford's assembly lines greatly increased the production, and lowered the cost, of Ford's famous Model T. These drawings, from Ford advertisements of 1914, show the advantages of the "new" Model T over the "old fashioned" street car.

The Birney car was the first successful attempt at standardization of street railway rolling stock. Hitherto street cars had been virtually custom built for each transit company. There was an almost universal conviction that each city had some peculiar operating conditions and local policies which requires specially designed equipment. Birney realized that here was an opportunity to come up with a car design acceptable almost anywhere, - one that could be mass-produced at a substantial saving in cost. With this in mind his design was simple and basic. The body was 28 feet long, 7 feet eight inches wide and nine feet ten inches high (rail to roof) with a simple arch roof. The car was arranged for two-direction running, with controls and a single folding door at each end. There was no attempt at styling or ornamentation - the sole aim being functional simplicity. As a result the body lines were rather severe, giving the car a "boxy" appearance.

Light weight was achieved by using the recently adopted method of constructing car bodies of pressed steel shapes and plates whereby the entire side acted as a truss. With traditional

wood construction the trend had been towards heavier cars in order to achieve strength and durability. Skilfully designed steel body framing now reversed that trend. Light weight meant less power consumption and less wear on the track. The Birney had a dead weight of about 16,000 pounds compared to about 25,000 pounds for a good quality wooden car of the same size or, in other terms: 600 pounds per foot of length as opposed to 900 or 1000 pounds per foot then prevailing.

A return to the small four-wheel street car was in itself quite radical. Although many were in use, the trend since early in the century had been towards larger, double-truck cars for all but the lightest duties. Mounted on an improved single truck and equipped with two 25 horsepower motors of advanced design, which required less space under the body, the Birney rode close to the ground on small diameter wheels (24 to 26 inches). As a consequence, passengers had only two steps from pavement to car floor. The floor was level throughout with no inside steps. Seating capacity varied from twenty-eight to thirty-two depending on seat arrangement.



BY RICHARD M. BINNS

THE SOLUTION: A side elevation of a typical Birney Safety Car as originally developed. Since these new cars were considerably lower than the larger ones formerly used, the trolley poles on the Birneys were often mounted on small towers to raise the bases to the level of the older cars. It was hoped that these modern lightweight one-man cars, offering frequent service, would woo passengers back to the street cars.

Drawing by Richard M. Binns.

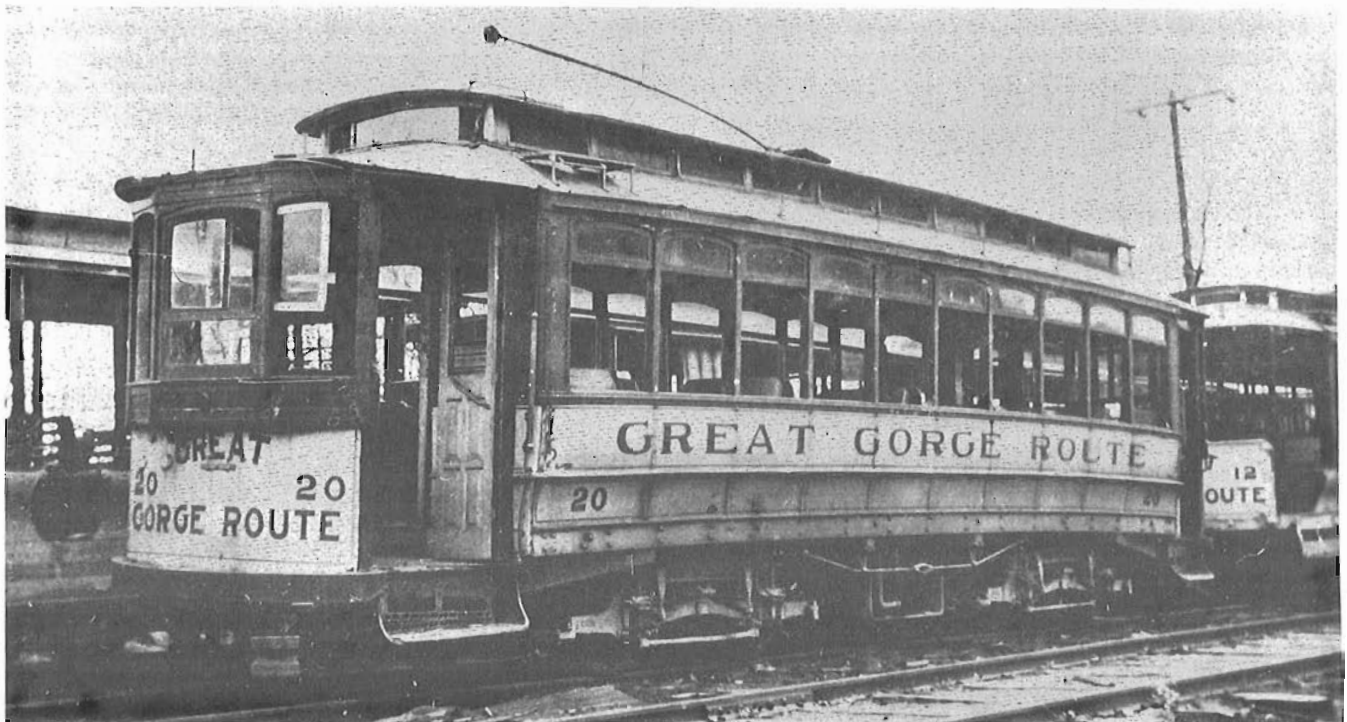
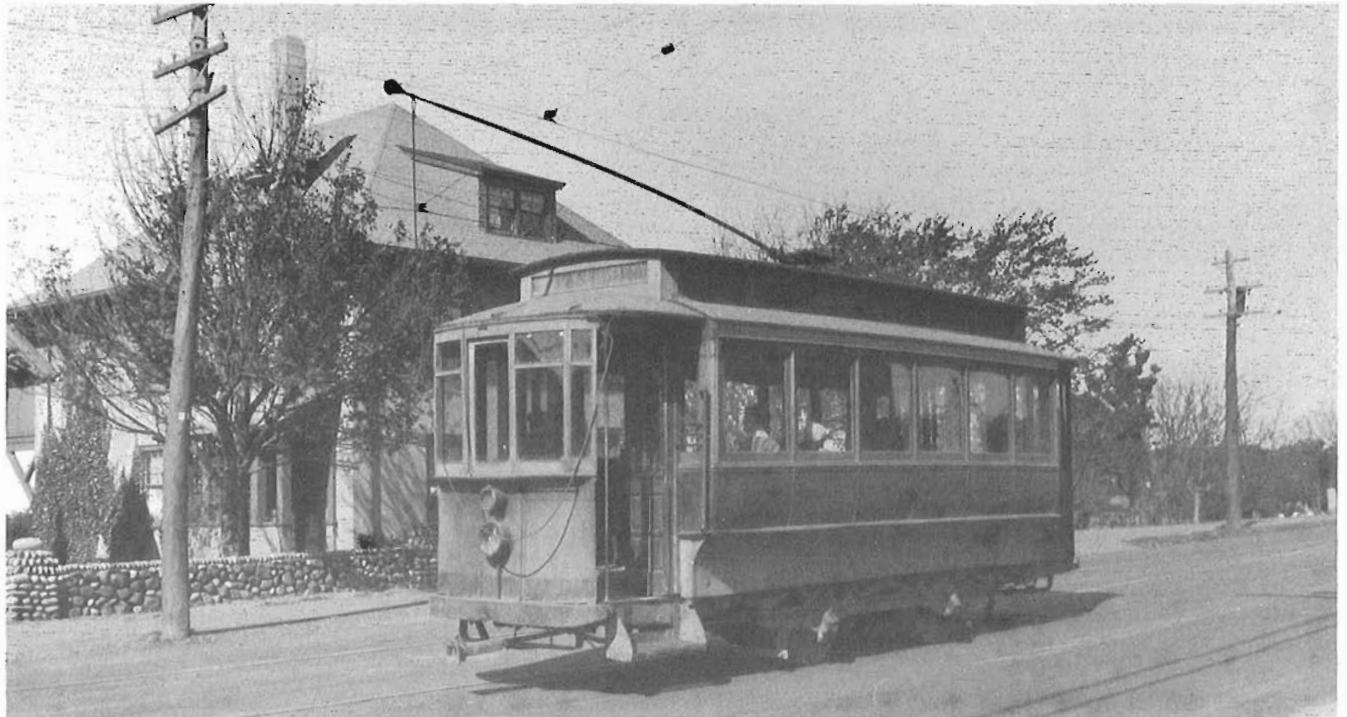
The big breakthrough was, of course, one-man operation for which the Birney car was specifically designed. One-man cars had been tried from time to time on very minor branch lines in a few places, but in general the practice of having a two-man crew was firmly entrenched. But Birney and other transit engineers recognized the inefficient distribution of labour on two-man cars. With the "Pay As You Enter" method of fare collection in general use, the conductor had little or nothing to do while the car was in motion and the motorman, of course, had nothing to do while the car was stopped. Given a small capacity car, appropriately designed, it seemed physically possible for one man to do both jobs.

Birney equipped his little car with air brakes, air operated door, step, and sander - all innovations on single truck cars. Power control, brakes, and door were interlocked in such a way that the door could not be opened until the car was at rest with brakes set. Conversely, the car could not be started with the door open. Should the "operator" - as he came to be called - for any reason become incapacitated while the car was running, and remove his hand from the "dead-man" controller handle, four things would happen automatically: power was shut off, brakes applied, rails sanded, and the door opened. Fearful that the public might not accept the one-man idea, railway managements emphasized these safety features in their public relations material and the car was officially designated the "Birney Safety Car". As it turned out, the public could not have cared less about its safety aspects and the word "safety" was later dropped.

The first Birney car built was placed in service in Seattle, Washington, on July 27 1916. Generally speaking, the cars were welcomed with open arms by street railway managements, and by 1918 orders were pouring in. Several car builders were involved, but the great majority of Birneys were turned out by the J.G. Brill Co., American Car Co., and St. Louis Car Co. In Canada a few were built by Ottawa Car Manufacturing Co., and Canadian Brill (Preston Car and Coach Co.) in the 1920s. A round-figure estimate of the total number of Birney cars built is usually given as 6000. A precise figure may not be possible but analysis of comprehensive data published by Harold E. Cox in 1966 reveals the following listing by years:

1916	23	1924	128
1917	155	1925	65
1918	413	1926	102
1919	1231	1927	45
1920	1817	1928	23
1921	617	1929	0
1922	679	1930	11
1923	418	TOTAL	5727

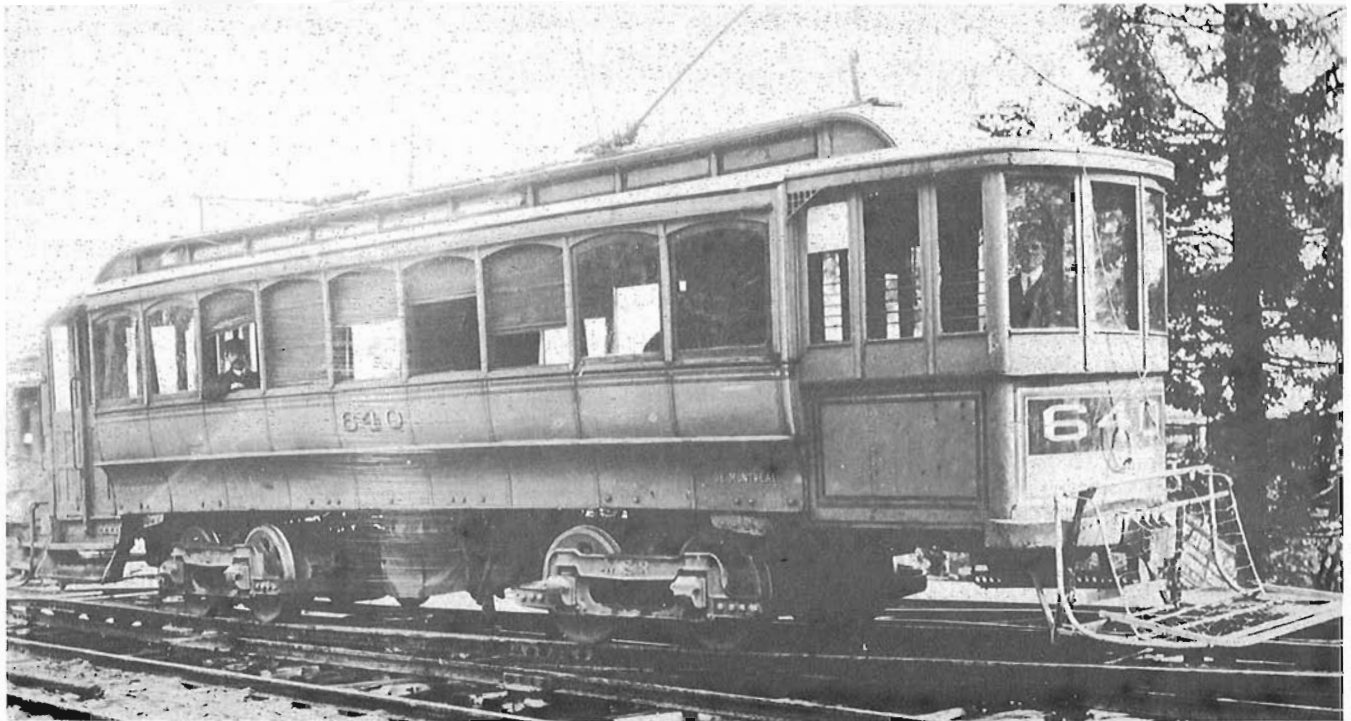
About 170 of these were for export, mostly to South America. The last built were for Mobile, Alabama and Monro, Louisiana in 1930.



Two examples of the outmoded rolling stock which was still in service in the 1920s. Although neither of these two systems used Birneys, others with similar outdated equipment did receive a reprieve from the new safety cars.

TOP: A single truck car of the 1890s in use in Yarmouth, Nova Scotia on October 12, 1927. Although in quite good condition, the car was of a type which had been obsolescent since the 1910 era. National Archives of Canada, photo No. PA-87915.

BOTTOM: This early double-truck wooden car of the Niagara Gorge line was photographed in the early 1930s, about the time the line closed. The car was a Brill semi-convertible, a type which was built in large numbers in the early 1900s, and used by many different systems. By the 1920s, however, their day had passed, and car 20 certainly showed its age. National Archives of Canada, photo No. PA-166479.



Before and after the Birneys came: The larger companies also benefited from the use of Birneys on outlying lines, as we can see in these two views on the Montreal Tramways system. The top view, taken in 1912, shows car 640, one of Montreal's earliest double-truck cars, originally built in 1900, as it looked after conversion to a double-ender for use on low density lines. The bottom photo was taken at Youville shops in 1924 and shows Birney 202, newly arrived from Detroit. The Birneys would soon replace old wooden cars like 640 on routes such as Cote des Neiges, which was then a short stub-end line.

CRHA Archives, Binns Collection.

Results of Safety Car Operation

By J.C. Thirlwall

From an article in the Electric Railway Journal, October 2, 1920

There are in service today more than 3000 safety cars, one-man operated; there are on order and in the course of construction about 900 more, and the writer believes this is only a good start. Their value to the industry is only beginning to be appreciated, and eventually, we believe, there can be and will be some 18,000 to 20,000 in service in this country and Canada.

Some few roads have criticised the maintenance, some have felt that changes to the doors or seating arrangements could be made to advantage, some think the ends of the cars must be strengthened against collision. But no general criticism of the design or equipment has been made, and the volume of repeat orders coming in from all sections of the country is the best testimony of the general satisfaction which the standard car has given.

The progress of the safety car idea has been remarkable. Starting in 1916, or just four years ago, the Stone & Webster management placed twelve or fifteen cars in service at Fort Worth, Bellingham and Everett. Within six months it was convinced that it had discovered a big new principle of operation. A number of car and equipment engineers agreed and proceeded to advertise the idea. But by the end of 1917 there were less than 100 safety cars in operation, the installations were small and the whole matter was still in the experimental stage. However, it was during this year that the Stone & Webster operators standardized on a car which was slightly different from Mr. Birney's original design and which, with only slight modifications in equipment and dimensions, has since been accepted as a standard by the industry as a whole. By the end of 1918 there were between 500 and 600 of these cars in service, and their successful operation in cities of considerable size had given an immense impetus to their general use. By the end of 1919 there were approximately 150 cities in which safety cars were running, and about 1600 cars were in service. Today the number of cars in service has nearly doubled, and the number of cities in which they are used is well over 200. When existing orders are completed, within a few months, approximately 250 cities will be using 4000 of these cars.

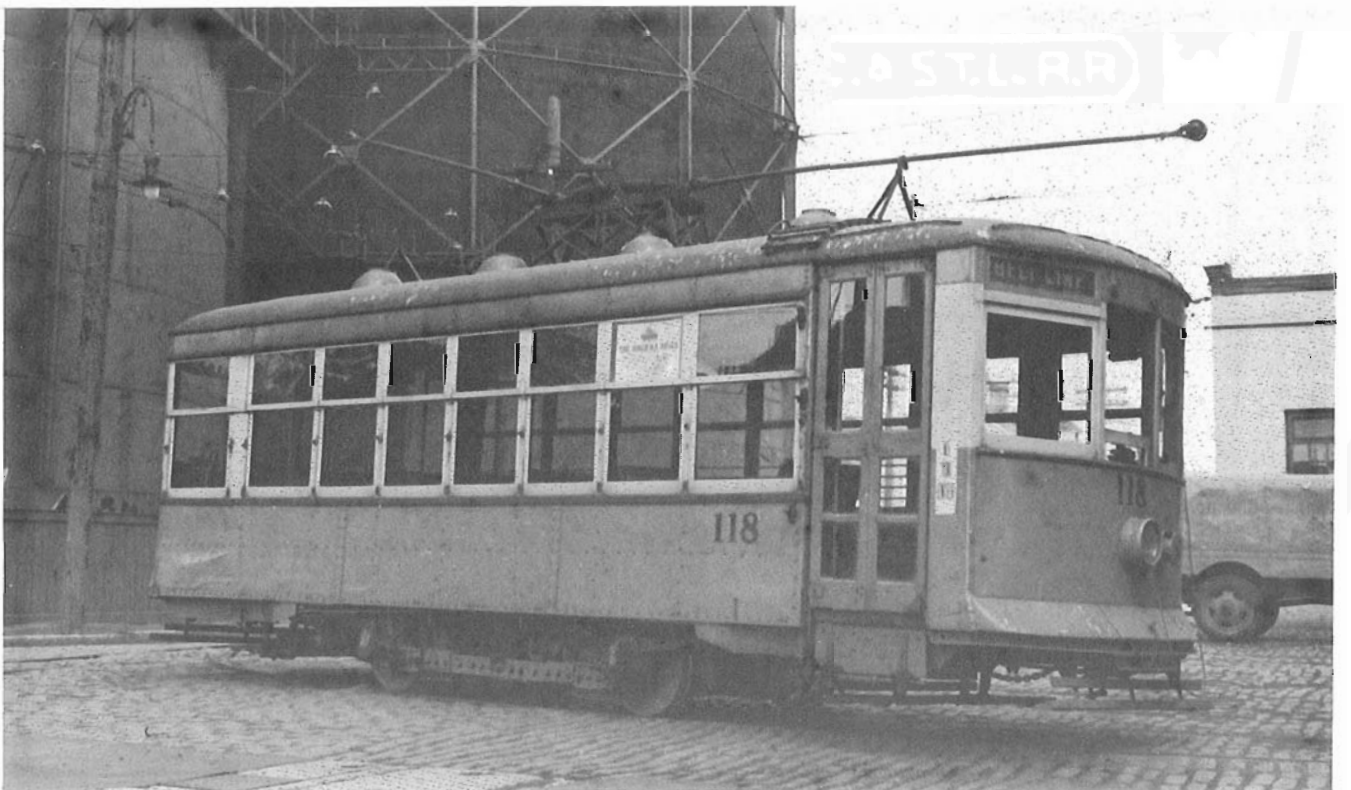
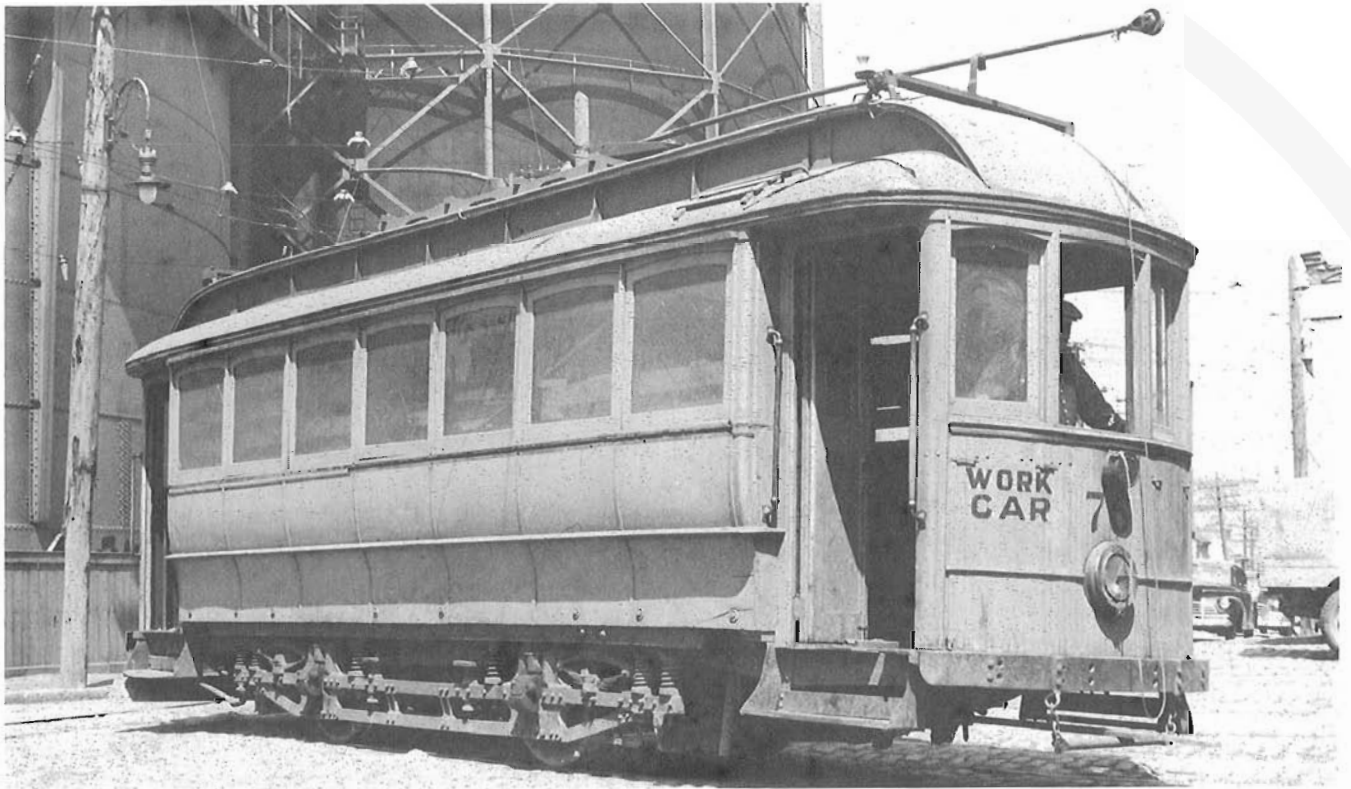
The writer has been absolutely convinced that the light-weight, one-man operated safety car is the best vehicle yet developed with which to meet the average and normal passenger transportation conditions in every city; that it can be operated more economically per passenger handled than any other type of car; that with it better and more generally satisfactory service can be offered to the public for any given expenditure than with any other type; that it is extremely popular with the riding public, not only because of the improved service that has usually accompanied its use but because of its design and riding qualities, and that its general adoption and wider use hold out better prospects of financial rehabilitation to the average road than does any other physical change that can be made in the operation of the electric railways.

Tabulations of figures submitted by electric railway companies show that any urban electric railway can secure a reduction of almost 40 percent in its operating cost, or it can operate 80 percent more mileage with safety cars than with heavy two-man equipment, with no increase in operating expense. It therefore follows that increases in service, or mileage, amounting to 30, 40, or 50 percent can be made and still save materially in the operating accounts. The great majority of installations have been upon the latter basis. Of the 38 companies reporting, only ten made car-for-car replacement. They are in general the smaller cities and own only 124 cars, or less than 10 percent of the total. Three companies owning 137 cars report 100 percent increase in service, or two safety cars operated for every two-man car displaced. The remaining 25 companies, owning approximately 1000 safety cars, all show increases in service ranging from 20 to 80 percent, and averaging 50 percent.

A point of great interest to the public and to the operators alike is the relative safety of operation of one-man and two-man cars. W.H. Burke has demonstrated conclusively that the safety car is well named, that it actually does have fewer accidents than the older cars handled by two men, and that personal injuries, both by the public and employees, are reduced by its use. Most companies report "personal injuries reduced", "step accidents less" etc., but a number say in effect "personal injuries less, but property damage more". In fact after reading all the reports, the conviction is unescapable that collisions with other vehicles, especially automobiles, are more frequent with safety cars than with heavier types, and that the damage done to the safety car is greater. This condition may and probably will be minimized by changes in the platforms of the cars during the past year. The car builders have made a considerable improvement in these two details, largely as a result of complaints of collision damage.

There seems to be a general conclusion that there are no limiting conditions for safety cars in cities up to 150,000 unless it be lines crossing a great number of steam road crossings or carrying an unusually large factory load. One or two managers believe that lines having normal headways of less than four minutes are unsuitable for the safety car. But one manager "sees no reason why they could not be operated on a thirty-second headway".

The conclusion is that to many railways the use of safety cars will be very rapidly extended until the bulk of the all-day runs, or basic schedules, in every city will be handled with these cars. To many railways its use to the maximum extent will spell all the difference between prosperity and bankruptcy. To many others it will give the ability to pay a liberal return to the stockholders, and enhance the value of all their securities. For thousands of platform men it will provide safer, better paid and more interesting work. And to millions of city dwellers, it will offer a more comfortable, a more frequent and more satisfactory service. And by all of these groups there will be voiced the sentiment, tersely expressed by a good friend of the writer's in Texas, one of the pioneers in the safety car movement, "It's good enough for us!".

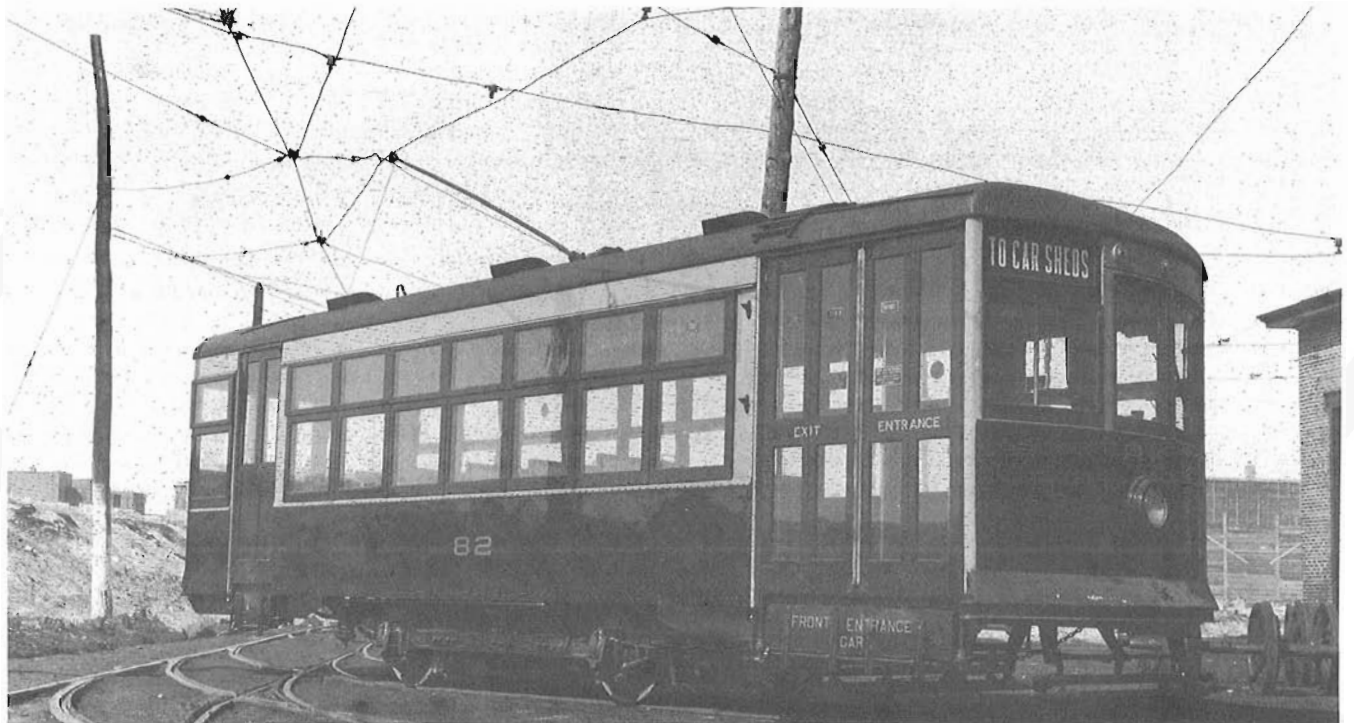


Halifax, with 82 cars, was the largest user of Birneys in Canada. The top view shows the newest type of car in Halifax before the Birneys. The bottom view is one of the first Birneys. Only five years separate the building dates of these cars; 76 was built in 1915 and 118 in 1920. Both these photos were taken on May 30, 1949, after all service had ceased and just before the cars were scrapped. CRHA Archives, Toohey Collection.



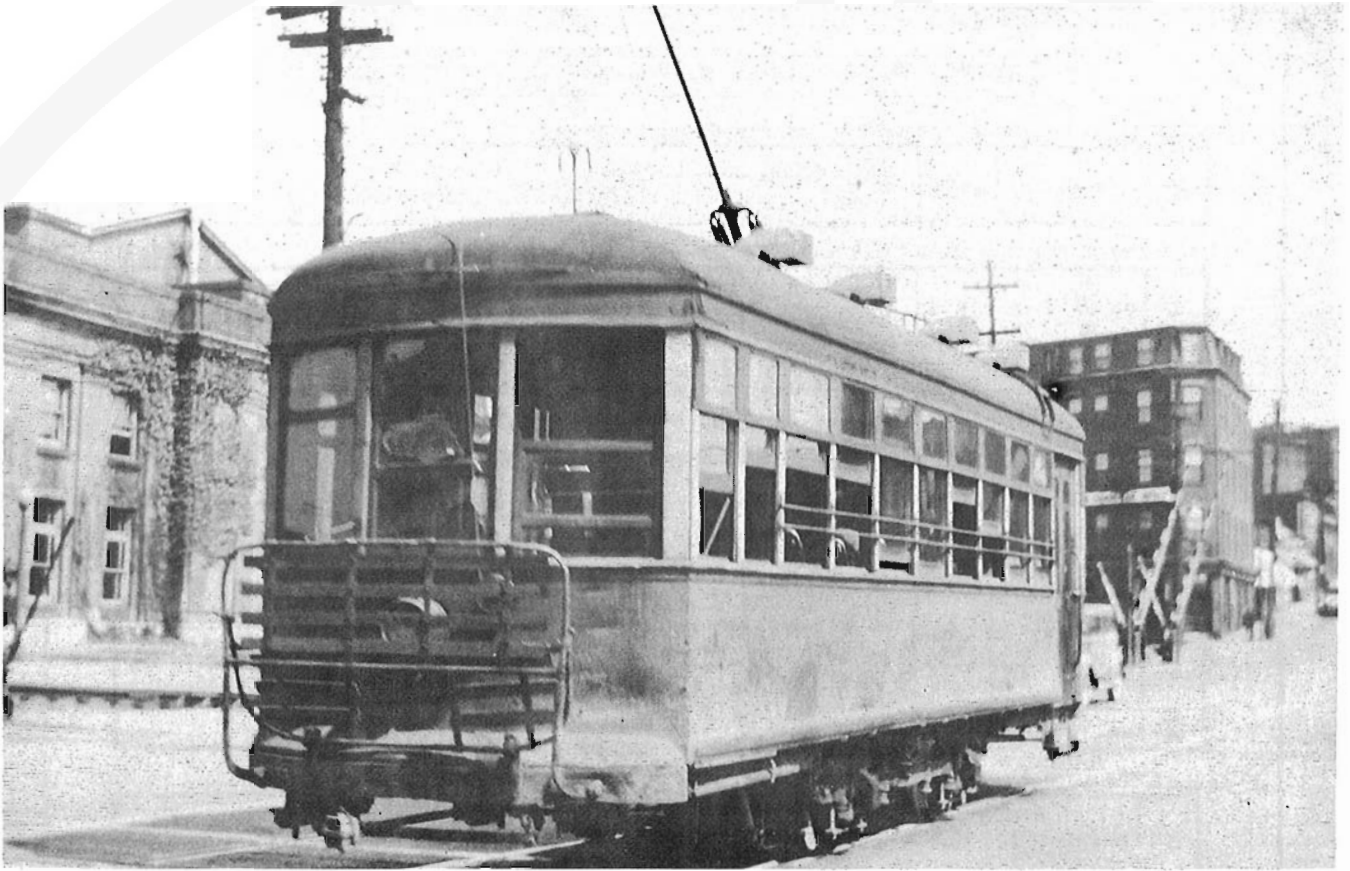
A broadside view of Montreal Birney car 216, photographed in 1931. This car had formerly been Detroit car 201, built in 1921, and it was scrapped in 1939.

CRHA Archives, Binns Collection.



A variation on the traditional Birney design is exemplified by Quebec City car 82. Unlike most Birneys, this car had a rear exit with a treadle-operated folding door. No. 82 was one of a group of 10 (80 - 89) built by Ottawa Car Mfg. Co. in 1923 and scrapped about 1938.

National Archives of Canada, photo No. PA-166555.



Some companies operated cars which superficially resembled Birneys, but there the resemblance ended. An example of a "Birney look-alike" is this car of the New Brunswick Power Company in Saint John N.B. Built between 1925 and 1929 in the Company's own shops, the 130-class were the same size and layout as Birneys, but had hand brakes, heavyweight wood frame construction, and none of the safety devices or other features that made a Birney a Birney. The NBPCo. also rebuilt some of its older cars to the same one-man configuration that had been introduced by the Birneys. This photo was taken in 1947, a year before the Saint John system was abandoned. Note the Union Station on the left of the photo. Photo by A. Clegg.

Attesting to their wide acceptance, Birneys were to be found in at least 358 cities and towns, in forty-three of the then forty-eight United States. In Canada, 22 cities, in seven of the then nine Canadian provinces, operated Birneys during the 1920s.

Spectacular increases in passenger traffic were reported by some companies after introducing a more frequent service with Birney cars, especially where they replaced old decrepit rolling stock. Taking a page from the jitney's book, some progressive transit companies were now anxious to offer the public a service it couldn't refuse - a rather visionary doctrine expressed by the slogan "Always a car in sight". Some of the large traction enterprises that provided local service in several regional cities invested heavily in Birney cars. The Connecticut Company, serving nine cities, had one hundred and sixty five Birneys. Eastern Massachusetts Street Railway had two hundred and fifty. Public Service Railways of New Jersey had two hundred and the City of Detroit also had two hundred.

The market for Birney cars was pretty well saturated by 1923 and production tapered off sharply thereafter. Not all applications were an unqualified success from the passenger's point of view.

An inherent defect of four-wheel street cars was their poor riding qualities unless given a near-perfect track. All too often small, financially troubled systems, which benefitted most from the new cars, had allowed their tracks to deteriorate. Consequently the lightweight single truck Birneys sometimes acquired an unfair reputation for rough riding and a proneness to derailment. Then again, several large city systems which attempted to use them on heavy traffic lines found them inadequate, and after two or three years most were sold to small city systems.

Just how much the Birney cars contributed to the demise of the jitneys is impossible to say - probably quite a bit in some instances. But one is inclined to think that municipal common sense finally prevailed and outlawed their activities. At all events, jitneys had virtually disappeared by 1920.

After the first flush of success, Birneys gradually fell out of favour. The prosperity of the "Roaring Twenties" was bringing more passengers to the street railways and in some cases it soon became obvious that the Birneys did not have the reserve capacity to absorb unexpected overloads or to meet rush hour requirements. It was claimed by some that, with two 25-horsepower motors, they

BIRNEY SAFETY CARS IN THE ATLANTIC PROVINCES

ST. JOHN'S — Newfoundland Light and Power Company

8	no 10—17	1925	New - Built by Ottawa Car Mfg. Co. — Scrapped 1948 3 ft. 6 ins. gauge trucks. but bodies full size — Doors on one side only
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MONCTON N.B. — Moncton Tramways, Electricity & Gas Company

2	no 6, 7	1923	From U.S.A — Buider and origin unknown — Sold to Halifax 1932 Possible existence of a third car No.5
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ST. STEPHEN N.B. — Calais Street Railway INTERNATIONAL OPERATION: CALAIS MAINE ↔ ST. STEPHEN N.B.

5	no 9015, 9018, 9058 9061, 9075	1926	From Boston Elevated Ry. — same numbers — Built by J.G.Brill 1920 All sold to Binghampton N.Y. for trucks and spare parts 1929
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SYDNEY N.S. — Cape Breton Electric Company

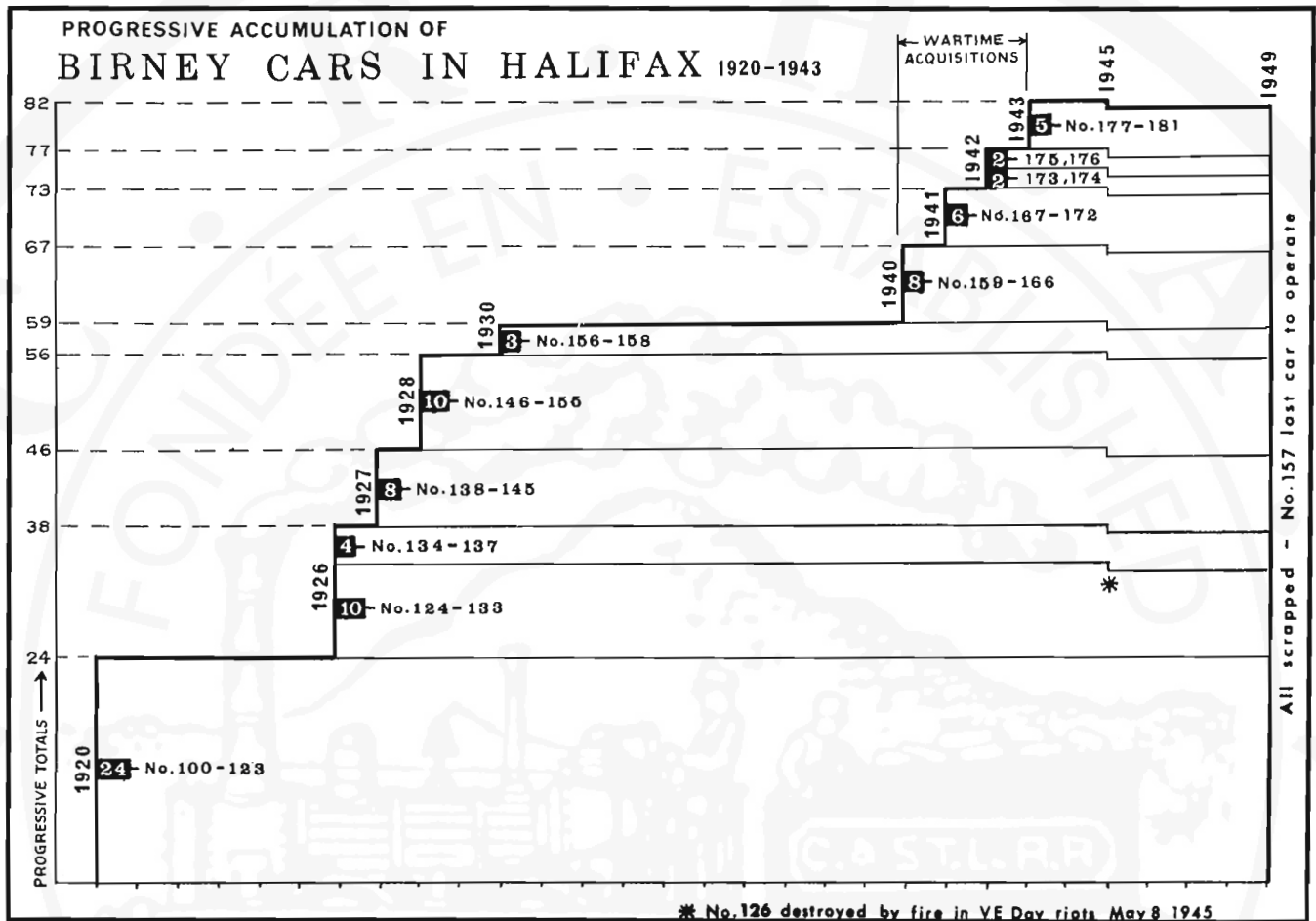
2	no 51, 52	1918	New - Built by American Car Co. St.Louis — Scrapped c1944 Built for left-hand operation Changed to right-hand 1923
5	no 55 [?] 59	1928	From Citizens Traction Co. Oil City Pa. Nos. 92-100 even — Built by J.G.Brill Co. 1923 Sydney numbers uncertain 3 cars sold to Halifax 1930.- Others scrap. c1944
2	no 60, 61	1924	From Detroit no.150 series — Built by J.G.Brill 1921. Sold to Halifax 1942

HALIFAX N.S. — Nova Scotia Tramways & Power Co ← 1928 → N.S. Light & Power Co.

24	no 100—123	1920	New - Built by American Car Co. Built for left-hand operation Changed to right-hand 1923
10	no 124—133	1926	} From United Railways & Electric Co. Baltimore Md. no. 4001 series. Built by J.G.Brill Co. 1920
10	no 146—155	1928	
4	no 134—137	1926	New - Built by Ottawa Car Mfg. Co.
8	no 138—145	1927	} From Toronto Transp. Comm. - no. 2216 - 2264 even series All built by J.G.Brill Co. 1920 for Toronto Civic Ry. 60-84 series-To TTC 1921
8	no 159—166	1940	
6	no 167—172	1941	
3	no 156—158	1930	} From Cape Breton Electric Co. Sydney. no. 55-59 ? and 60. 61.
2	no 173, 174	1942	
2	no 175, 176	1942	From Quebec Asbestos Co. East Broughton Que. { no.175: Built by American Car Co. 1921 for Sherbrooke Que. no.22 - Sold to Que. Asbestos 1938 no.176: Built by Wasson Car Co. 1921 for Dover N.H. car C Sold to Sherbrooke Que. 1926 no.29 — Sold to Quebec Asbestos 1938
5	no 177—181	1943	From Bakersfield & Kern Elec. Ry Co. Bakersfield Calif. { no. 177, 178: Built by American Car Co. 1922 for Union Traction Co Santa Cruz Cal. no.22, 24 Sold to Bakersfield 1927 no.17,19 no.179,180,181: Built by American Car Co. 1921 for Santa Barbara & Suburban Ry. no. 41-50 series Sold to Bakersfield 1929 no.20,21,23.
2		1932	From Moncton - no.6.7 Not operated in Halifax - used for spare parts

Note: no.126 destroyed by fire in VE day riots May 8, 1945 — All others scrapped 1949

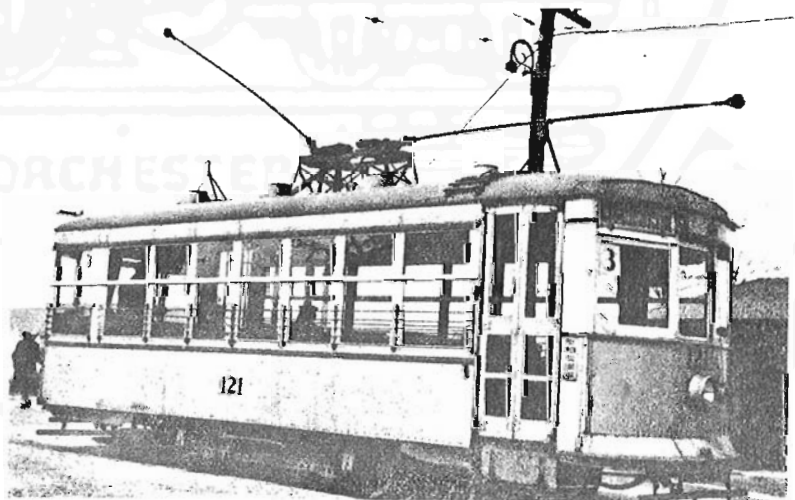
Although Halifax was by far the largest Canadian user of Birneys, other cities in eastern Canada had them as well, as we see from the charts, prepared by Richard Binns, on these two pages.



were underpowered. Others complained of their poor performance in snow storms. Many were sold after a few years service. As a consequence more and more of the smaller cities could pick up second hand Birneys at a price they could afford. Some cars changed hands two or three times.

Whatever the merits and defects of the Birney concept, the cars did prolong street railway service in many small communities for a few additional years before buses took over. More important, they proved once and for all that one-man operation was safe and acceptable. They introduced a whole series of safety devices and automatic air-operated equipment, as well as lightweight steel body construction. All these features were incorporated in a variety of new medium sized double truck one-man cars emerging in the late 1920s, covering most urban requirements, but without the Birney's virtue of standardization. Nevertheless, this new trend did culminate in a standard model - the famous PCC car in 1936.

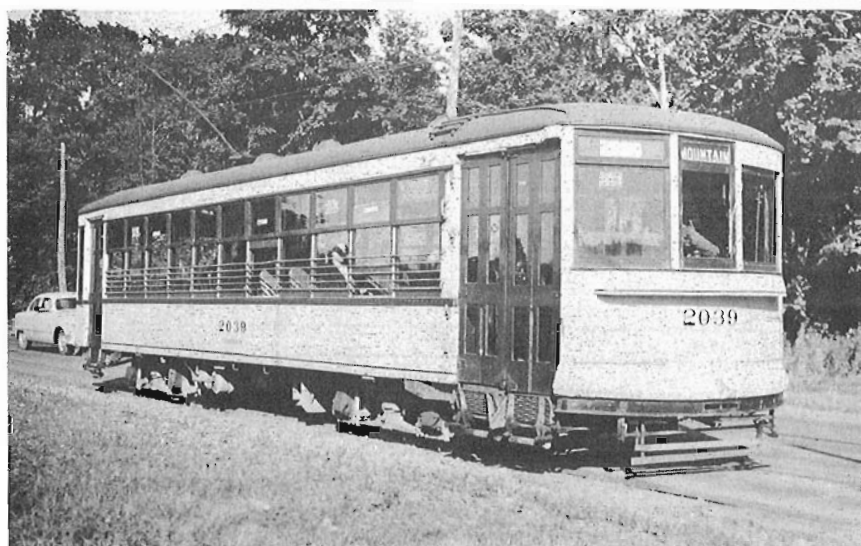
Abandonments and bus substitutions, during the economic depression of the 1930s, eliminated many of the Birney cars - a process that was temporarily halted during the Second World War, but which continued unabated thereafter. Even on lines which were not abandoned, the Birneys showed their



One of Halifax's original Birneys, No. 121 was built by American Car Co. in 1920, and lasted until the end of service in 1949. It is here seen in 1942.

CRHA Archives, Binns Collection.

age. Being of lightweight construction, and now more than 25 years old, they were worn out. By the late 1940s practically all had disappeared. The last Birneys to operate in regular passenger service, in either the United States or Canada, were those of the



LEFT: In the 1920s, a double-truck version of the Birney was developed. These cars were smoother riding and, of course, had larger capacity. In other respects the double-truck Birneys were identical to their smaller brethren, and they were the forerunners of numerous lightweight one-man cars with the new safety devices. This car was built by J.G. Brill in 1926 for the Alabama Power Co. in Tuscaloosa, Alabama, where it operated as No. 202. In 1942 it was sold to Montreal where it was renumbered 2039, and remained in service until 1958.

CRHA Archives, Binns Collection.

RIGHT: A sad end befell Halifax Birney No. 126 when it was burned by rioters "celebrating" V.E. Day on the night of May 7 - 8 1945. This was one of the cars bought second-hand from Baltimore in 1926. The remaining 81 of Halifax's Birneys remained in service until the entire system was converted to trolleybus operation in April of 1949.

CRHA Archives, Binns Collection.



LEFT: One Birney remaining in Canada is B.C. Electric No. 400, displayed at Victoria, B.C. It is partly a restoration and partly a replica, and its truck is not the authentic type. Nevertheless, it is a fine example of a famous type of car.

CRHA Archives, Binns Collection.

His Honors Gathered — His Duty Done!



"HIS HONORS GATHERED - HIS DUTY DONE!" This sentimental cartoon appeared in a Halifax newspaper in April 1949, as the street car system was abandoned in favour of trolleybuses. Despite what the rioters had done to 126 on VE Day, Haligonians had great affection for their Birneys, and remembered the incredible service they had performed in the busy days of World War II. Thus the grief felt at their passing, as exemplified in this cartoon, was genuine. This was the last regular operation of Birneys in passenger service in Canada, although Montreal's No. 200 was used in occasional excursion service after that date.

CRHA Archives, Binns Collection.

Fort Collins (Colorado) Municipal Railway which ceased operation on June 30, 1951. [Editor's note: A portion of this line has been rebuilt and is operated, as a tourist attraction, using one of the original Birney cars]. South of the Rio Grande, a few Birneys remained in service in Vera Cruz, Mexico well into the 1970s.

Considering the thousands of Birney cars built, surprisingly few have been preserved as historical items of rail rolling stock. Scarcely a dozen might be found in the entire United States. In Canada, former Montreal Tramways Company No. 200 (ex Detroit No. 223) is maintained in operating condition at the Canadian Railway Museum near Montreal. A replica, built on the partial frame of Victoria B.C. No. 400, is displayed in Heritage Court, outside the Provincial Museum in that city.

In terms of total car-miles operated within a single community, Halifax was probably among the top users of Birney cars in North America. When its tramway service ended on April 30, 1949, unhappily none of the eighty-one remaining cars was preserved.

Sources:

- Trolley Car Treasury - Frank Rowsome.
- The Birney Car - Harold E. Cox.
- The Time of the Trolley - W.D. Middleton.

A Trip on the White Pass & Yukon Route - 1994

By Peter J. Lacey

Whenever gold is discovered in large quantities, men swarm to try and get it for themselves. When many men and tons of goods have to be moved, transportation systems are built to do it. The most efficient form of bulk land transfer - as much today as in 1899 - is by railway. So it was that the White Pass and Yukon Railway was built, with an urgency that didn't compromise the quality of the work, for 96 years later it is still running. And so it was that I was able to take the tourist trip up to the top of the hill and then back down again.

My parents and I went on a cruise in September, 1994, from Vancouver up the inside passage as far as Glacier Bay, Alaska. We enjoyed the trip; it was an interval of elegance and superb service which contrasted more and more strikingly with the increasing harshness of the land as we steamed further north. However, even the most determined cossetting can pall, so at all the three ports of call a variety of side trips was offered. The jaunt on the WP&Y (known to the cognoscenti as the "Skagway fly-fly") came on the Tuesday of our trip, and was for me the high point of the cruise.

The WP&Y starts at Skagway, which these days is a hardy community of some 600 people, largely dependent on the tourist trade. However, small and isolated as it is, access is easy by road, sea, or air, and you can even arrive there by train - the last part of a trip started on the bus at Whitehorse. We flew in from Juneau: a hair-raising closeup of the glaciers north-east of town, up and over the icefall although we weren't able to view the icefields on the plateau due to clouds, was followed by a more serene flight along the Lynn Canal, a long fjord that goes all the way up to Skagway. (It was named by George Vancouver after King's Lynn in Lincolnshire, a touch of nostalgia for my mother who was raised near there). The mountains here are not tall but are most impressive, being twisted, tortuous, and precipitous. In a small 'plane you get a much more intimate and detailed view than from ground level, and although the flight was bumpy at times I was mildly sorry when we settled gently out of the sky onto the tarmac at the tourist town.

Considering how small Skagway is, and how long ago the gold rush took place, there's really quite a lot to see. Visit the Red Onion cafe; it used to be a house of ill repute, but now features a terrific collection of bedpans, waitresses in period dance-hall costumes, a young fellow in a pork-pie hat at the piano playing sprightly Scott Joplin numbers, and excellent, although expensive, nachos and sandwiches. There are many tourist-trap establishments, but it must be said that the merchandise is most acceptable. The U.S. Parks Service has a small museum with an auditorium which



WP&Y locomotive 52 on display at Skagway.

All photos by the author.

shows several films on the gold rush and other historical topics; we found it easy to fill in the two hours or so before the trip was to start.

If you go no further, there's still a lot for the railfan to see in Skagway itself. The Parks service museum is housed in a former WP&Y station. Steam engine #52 is on display across the street (although it hasn't been looked after and is rotting away). There is the present station, small but attractive, with a gift shop and a surprising amount of office space; but then the WP&Y runs seven or more trains a day at the height of the season, and has large part-time right-of-way maintenance and shop crews, so administration is a complex business. Tracks meander all over the waterfront; it is brought home that this is a narrow-gauge operation - 3' - as the tracks at first sight seem much too close together. There are docks in the harbour for two ocean-going ships; today two of the P & O's "Princesses" were in, made to look tiny below Mt. Harding across the Canal. A train had recently departed from one dock, and ours was drawn up beside the other. Further into town is another museum, with steamer #195 on display, in much better shape than #52. And finally, there are the yards and shops of the railway. Some equipment is on display here too, the most impressive piece being steam rotary plough #1, retired in 1962. A dozen or so passenger cars (all named "Lake ----") were parked there today, all of which are in regular use, although one is on the spare board as its roof leaks. It rains a lot at Skagway. Behind the shops is diesel engine #109; it's not obvious whether it's on display or just parked outside, as its paint job is flawless and it certainly doesn't look neglected. Certainly one could spend a full day just "doing" the railway operations in the town.

But we came here to take the trip up to the Pass, so best we get back to the station. Our train was waiting by the ship, twelve cars with three diesels to get us up the mountain. They were #91, #92, and #93, General Electric products from 1953 and 1956 of 800, 890, and 890 horsepower respectively. Their colour scheme has varied, but now they are in a green and yellow livery which doesn't quite work. The coaches are of all sorts of origins; ours, by chance, was the oldest of them all, dating from 1884. It has a pot-bellied stove, fine woodwork, slender ornamental railings on the vestibules to prove its antiquity, but also has electric lights, and thoroughly modern brakes and couplers! The engineer strolled by, natty in a purple waistcoat and a tall cap, and fired up the train. The engines made a rather weary grinding noise rather than the usual diesel rumble, but they were soon to prove that they are more than equal to the work. Normally, steamer #73 takes the train to the edge of town, but as this was the last day of the season, she had been put away.

With a great shrieking of wheels on the tight curves, we were away. From the very beginning of the line, the railway is built hard against the mountainside (always on the right as you leave town), as the valley bottoms are very rough and uneven, traversed by the straggling mountain rivers whose levels and courses are constantly changing; it was certainly better to carve the line out of the mountain despite the greater initial expense and thereby save forever the unending maintenance problems that the valley route would have entailed. The train crept at a dismayingly slow pace past the museum, the yards, and the graveyard where lie Frank Reid and the villain "Soapy" Smith. Somewhere on the train was a young lady commentator; after welcoming us aboard, her first comment was on our speed; don't worry, she said, we are only creeping to make sure we stay ten minutes behind the other train, as required by law, and we can go much faster. However, she said, we won't be going much faster than 15 or 20 mph the whole trip. Fair enough. Once out of town, we did pick up speed. For a while, the line goes beside the river - a mass of boulders at this season - already beginning to climb through stands of poplars and pines. The grade averages 2% to the top of the pass, increasing to 3.9% in places: clearly the motive power must be resolute stuff! Once the line lifts above the valley floor, the highway on the other side is visible. This highway was an important factor in the closing of the railway in 1982; in spite of its steep grades and twisted route, it provided a transportation alternative with which the railway couldn't compete when its main business, hauling ore from the mines in the Yukon, ceased in the early 1980's. The highway looks like an exciting drive in itself; but for us, today, it was just one more thing to comment on.



Engines 91 and 92. Last trip of the season.

Something that strikes the modern traveller is the existence of named points where stations used to exist; today there's nothing there and no sign that there ever was anything. One wonders what on earth the stations were there for: surely nobody actually lived there! Nowadays, Denver (mile 5.8) is one of two flag stops where hikers can get on or off: genuine, if slight, passenger service. At Clifton (mile 8.6), where there once was a section gang headquarters, there is a siding and a passing track; and at Glacier (mile 14) there is a caboose (off the track) which has been refitted as a rest stop and shelter for hikers. Apart from these, Heney (mile 12.3), commemorating the construction contractor, marks the spot where supplies were lifted on an aerial tramway from "White Pass City" on the Brackett wagon road.



Some of the rolling stock: "Lake Norwatka" and "Lake Spirit".



The White Pass & Yukon station at Skagway.

As the train climbs, the view widens out and becomes grander. At mile 6.9, there is a fine view down the valley past Skagway to Mt. Harding and the Harding Glacier across the canal. The train had indeed speeded up and it was now clicking confidently along at about the promised 20 mph. We were in the third coach, and from there the steadfast roaring of the three diesels was quite audible. Even by this time the line has climbed quite a distance above the valley, the trees on the left rather reassuringly blotting out the prospect from time to time. More and more the line is perched on embankments of boulders piled against the mountainside, and the gaps in the trees reveal bigger and bigger drops into the valley. The river has become a proper mountain torrent, and at one point it seethes through a ferocious cauldron of green water which, our guide says, no-one has ever kayaked through - an observation we found easy to understand. There are some more points of interest; Black Cross Rock, where a blasting accident caused a 100-ton boulder to bury two workers, is now marked by a wooden cross; and a sign across the canyon reads "On to Alaska with Buchanan", commemorating the Buchanan Boy's tour in 1930.

At mile 11.5, across the valley, are the Bridal Veil Falls. At this season, they were diminished from their springtime glory, at which time as many as 22 cataracts have been counted, but they were still powerful and impressive torrents. About here I had to give up taking photos; we were passing gradually into low-lying clouds, and with the coach windows cutting down the light further, I was attempting 1/15 second exposures - not practical from a moving train! And that was a great pity, because here the ride goes from the interesting to the incredible: adjectives start to get out of hand and finally only the sadly-misused "awesome" can be applied.

The line swings to the right, approaching Glacier, and begins the long horseshoe loop that eventually attains the pass. Up to this point the route had been in front and otherwise hidden by the trees, but half way along the canyon the trees open up to reveal the railway over the other side of the valley. Imagine, if you will, an

enormous wall of granite, thousands of feet high, miles long, almost vertical, always sheer. Scratched and pecked along its flank is an insignificant line, climbing relentlessly from right to left until it disappears around a shoulder of the mountain. Perched about halfway along this line, several hundred feet above us, was the other train, tiny against the cliff; from its windows a perfect barrage of flashbulbs went off as its passengers noticed us. Suddenly the enormity of the mountains which this railway dares to cross becomes adamantly clear, and there was a short but meaningful silence in the coach before people began to exclaim in their excitement.

The line swings back on itself at the head of the valley, over a trestle which seems higher and flimsier than it really is, as our apprehensions had been a little awakened by the sight of the oncoming climb. At first, as if to reassure, the train crawls through heavy cuts while the commentator talks of the amount of blasting

that had been necessary to drive the line through, but quickly enough the line comes into the open again and the vastness of the view becomes evident. Up and up, the climb continues, over side-hill embankments dropping further and further down, through cuts blasted out of the mountain, which are so narrow that the left-hand side of the coach is actually outside the cut; the commentator speaks of the advantages of a narrow-gauge line under these conditions. Indeed! One side of the coach slides over thin air, the other barely clearing the cliffside, while the drops below the line get higher and higher. The train slows to a walk - definitely because of the grade, certainly to give the passengers a better view, and probably to allow some chance of stopping if a derailment should occur! The line on the other side of the valley retreats further and further below us, eventually disappearing below the clouds, and all the time the climb continues, twisting and turning around the shoulders of the cliff, and the valley spreads out and the gulf to the left yawns wider and wider. Now and then, a ledge spreads out a little, and flowers and trees grow insouciantly at the edge of the precipice, but always the cliffside returns and the train clings to it again. It is impossible, even for the most sanguine, to avoid the feelings of exposure and precariousness which become stronger as the train creeps further up the wall and above the valley floor. Nothing continues forever: at last the climax comes; the train shoots out into space over a trestle with a drop of fully a thousand feet on the left - again with the side of the coach suspended over nothing - and then dives into a tunnel the total blackness of which is something of a relief as it completely surrounds you and abolishes the stupendous gulf just past. I defy anyone to look down here and not feel at least a twinge - even the most accomplished mountaineer! (The trestle itself is only about 100' high, but its feet are in a very steep gully which falls off practically vertically below it. The commentator says that there's nothing to worry about, as no train has ever fallen off the trestle - but she can't forbear to add, "yet". That may be true, but I did see down the mountainside what appeared to be twisted sheets of metal, which must have been part of a train!)

Not that the mountain had done with us yet, though. Shortly after the tunnel is another spectacular view back down to the sea - or it would have been if the clouds hadn't blotted it out. There are two views of the original trail where it was carved into the villainous terrain, making one wonder at the species of madness that would drive men to crawl over it again and again until they had hauled their ton of supplies to the summit. And today there was a final surrealistic touch as the train passed the abandoned bridge over Dead Horse Gulch - a fragile triangle of steel girders vanishing tracelessly into the clouds, leaping over unknown depths. Fellow passengers looked at each other and said, "They went over THAT?" Curiously, if it hadn't been cloudy, the sight would have been less impressive; the bridge is really quite substantial and the gorge isn't all that deep; but today imagination turned it into a wonder. (The bridge was built in 1901 to replace a series of switchbacks, and was in use until 1976 when it was decided that the steadily increasing loads of ore were straining the structure. The line was extended to go around the gulch through another tunnel).

Finally the summit was in view. After the thrills of the climb, all that is left to see is the ruggedness of the terrain, still notable as the line approaches Summit Lake. There is nothing to mark the U.S./Canada border except two sets of flags; nothing remains of the station at the summit except one decaying building. Summit Lake is remarkable only for the change of scenery it provides; as lakes go it is barely a puddle. But on a summer day it surely softens the rugged landscape and is a pleasant rest stop.

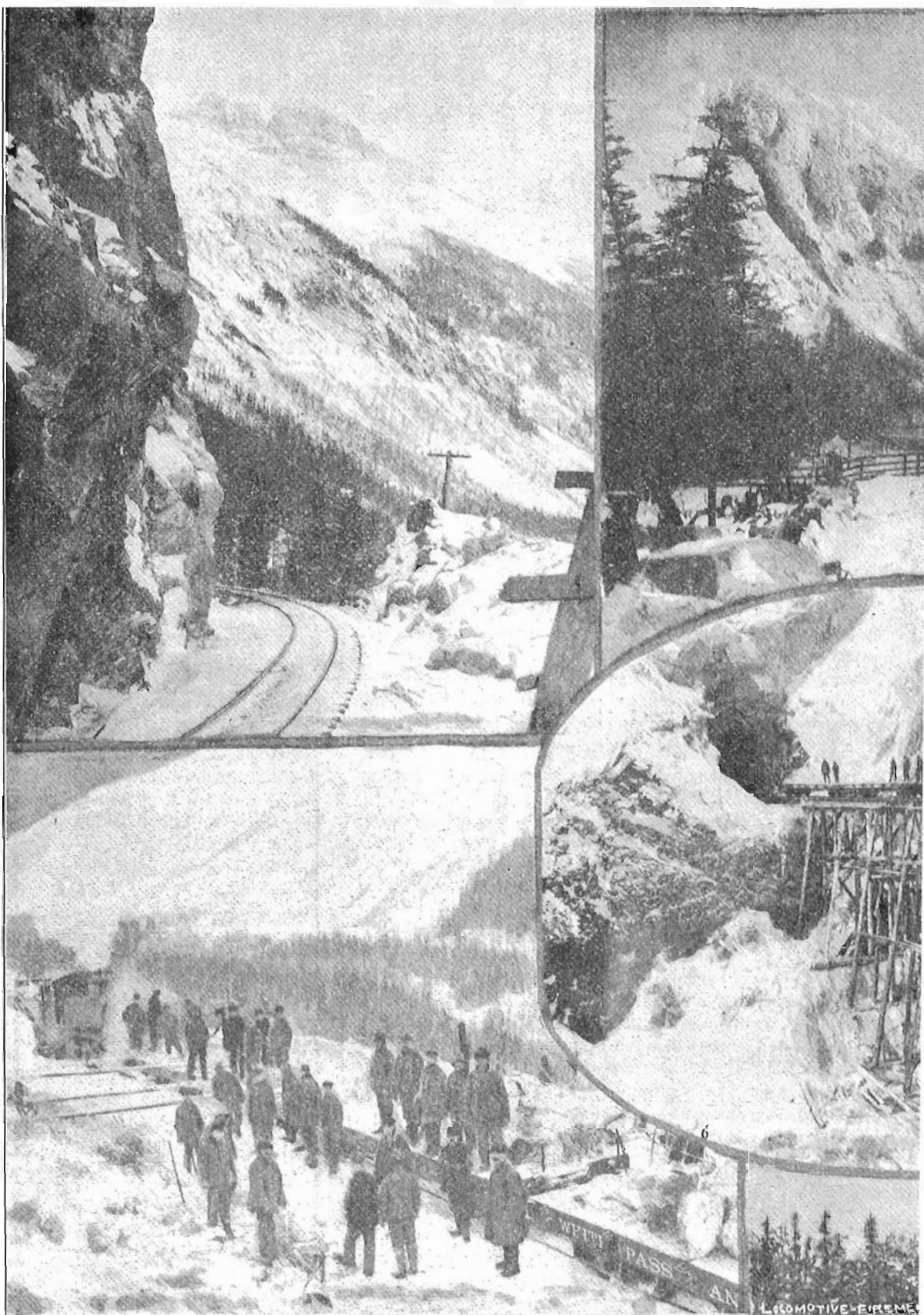
The other train was waiting on the passing track, and as soon as we cleared the switch it was off down the hill again. We stopped here for ten minutes or so as the diesels were detached and run past to the other end of the train; however, we were strictly enjoined not to get off as otherwise we'd have to put up with Customs. This seemed doubtful as there wasn't a soul about - Customs and the effective border are eight miles further up the line; where the bus trip from Whitehorse stops. The WP&Y operates these days as far as mile 40, to Bennett, at the head of the lake of the same name where in 1897 some 30,000 stampedees spent the winter. More likely than Customs was the prospect of getting left behind; there was another engine and some maintenance equipment up the line a little way, but it seemed wiser not to count on their benevolence. Our commentator instructed us on how to flip the chair-backs over so that we would be facing forward again, and asked everyone to trade sides so that the people who had been sitting on the right on the way up would get the thrill of the view on the way down. I must say that I was pleased to comply.

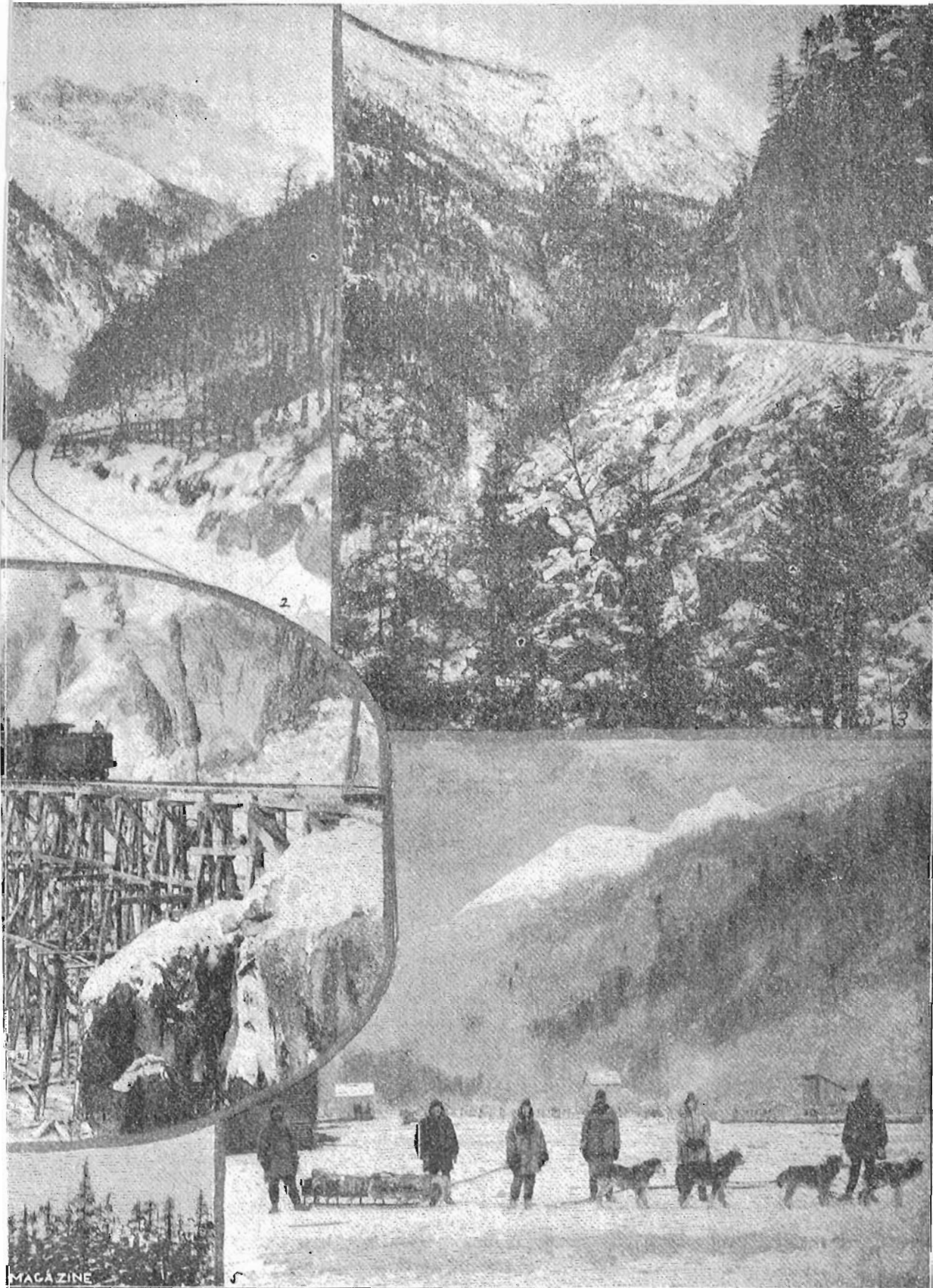


Skagway Junction, on the WP&Y main line, heading inland.

And so we started down. It was only slightly less exciting than coming up had been, since it was only our second view of the scenery. As well, there was the piquant thought of the train brakes and the three diesels in dynamic braking mode to consider. A number of brave souls congregated on the vestibules, perhaps to get better photos, as by this time the windows were pretty well fogged up. The various points of interest on the way down of course had a different perspective; for instance, the trestle over "1000-foot drop" now impressed in a different way: the piles of rubble to the left, at eye level perhaps 40 feet away, emphasized the terrific steepness of the drop to the right. The train gradually came out of the clouds and down into the ordinary terrain at the bottom of the horseshoe loop, with the passengers on the other train spotting us still halfway up the wall, and blasting us again with their flashbulbs, until at last we were down past the trestle and the caboose in red, feeling that slight letdown that comes after a spell of tension and adventure. The guide came to life again and spoke of the crumbling telegraph line beside the track and the brush-clearing that had recently taken place, but these were just background noises as we enjoyed the final easy ride back into Skagway.

We got off at the station and were taken back to the airfield to be flown back to Juneau in the increasingly gloomy rain, but there's no point in writing of that. This day was a great thrill from start to finish, exceedingly worth the getting there, however it's done. As I stood at the ship's rail, very late that night, watching the mooring lines being cast off in the pouring rain, I was retracing the trip in as much detail as I could, trying to fix it in my memory for the pleasure of remembering and the pleasure of telling the tale. Go see it for yourself: you'll be glad you did.





Up The White Pass in 1899

The following articles appeared in the magazine "The Railway and Shipping World" (the original name for what became the Canadian Railway and Marine World) during the year 1899. They describe the problems encountered in the construction of one of the engineering wonders of the time: The White Pass & Yukon Route.

The articles discuss the White Pass & Yukon from the Canadian, American, and British points of view. It is instructive to compare the three. Interestingly, only the Canadian accounts mention Heney, while only the American one mentions Reid or "Soapy" Smith.

Note that the name Skagway was often spelled "Skaguay" at that time. The spelling is sometimes inconsistent in the accounts, and we have followed the spelling of the original accounts.

THE WHITE PASS & YUKON ANNUAL MEETING

(Ry. & S. World, January 1899)

The first ordinary general statutory meeting of this Co. was held in London, England on December 5 [1898]. After preliminary remarks by the Chairman, Mr. S.H. Graves, of Close Bros. & Co., London and Chicago, spoke at length. The following is from his speech:

"Having just arrived from the Pacific coast I am glad to comply with the suggestion that I should give you the latest news as to the prospects of our railway and of the Yukon country.... Having secured the services of E.C. Hawkins, whom I had known for a number of years, and who was then chief engineer for a large enterprise in which my firm was associated with a number of leading men in New York, we reached Skagway on April 10 last. After a rapid preliminary reconnaissance, he reported that the line was entirely feasible, but that certain conditions were different from what he had been led to suppose in connection with the possession of the town site and of the wharf at Skagway, and that in consequence we should be obliged to materially modify our programme. The necessary arrangements have been made, Mr. Hawkins and his staff of engineers returned to Skagway about the middle of May, and proceeded to run alternative lines of survey in order to secure the best possible line to the summit of the pass. For this purpose no less than five different and complete lines to the summit were fully surveyed and worked out before the line was finally located. Of course, too much care cannot be taken in deciding the best line before beginning to spend money on construction itself. All this unavoidably took up much valuable time, especially as the difficulties of surveying in that country are almost beyond description. The result was that it was well along in June before Mr. Hawkins and I were finally satisfied that we had exhausted all the possibilities, and had reached the best possible solution of all the problems involved in locating the line.

Construction commenced in June, at first on a small scale, with only about 200 men, who were available at Skagway. These were supplemented as fast as possible by men obtained from the States and Canada, until in July we were working over 1500 men, and had every prospect of increasing to 2500 as soon as the harvest on the Pacific coast was over. In August the news of the Atlin gold discoveries reached our camps, and a stampede ensued, which reduced our force in one day from about 1700 to a little over 600. It remained at about that figure during August and September, gradually increasing to about 1000 in October and, in spite of all our efforts since, we have been unable to increase it above that

figure. The men who did remain were all green hands and unskilled, and quite unable to attempt the very difficult rock work then in progress. The result was that instead of reaching the summit of the Pass by the end of September, as we should easily have done had we been able to maintain the same rate of progress as in July, we are only now about reaching the summit, when we had hoped to have long since reached the lakes. However disappointing this may be for the moment, it is a small price to pay for the discovery of the Atlin gold fields within a few miles of our line.

From salt water to the lakes the work done is substantially all rock work, and the line has had to be blasted out of the solid rock. The difficulty and cost varied according to the accessibility of the work, and the amount of rock to be blasted. Sometimes over 100,000 tons of solid granite were dislodged by a single battery blast, and this reached a maximum on Rocky Point and Tunnel mountain. To reach the latter from the camp, some 1500 feet below, over 10 miles of trail had to be made, and 4d. [about 8 cents] a pound had to be paid to get our dynamite and powder carried up to the grade, from which one could have almost dropped a stone into the camp below. Of course, no horses could be used on this work, and everything had to be done by hand. The work on the U.S. side of the summit was all practically completed by the end of November, with the exception of the tunnel, some three hundred feet long, on tunnel mountain, and a bridge beyond over a deep ravine to which we could not convey the heavy bridge material till the tunnel was finished. The work on the tunnel, when I left, was being pushed from both ends, but was delayed by the necessity of moving all the debris by hand. It was expected that the tunnel would be finished by the end of November, and that within a week of its completion trains would cross the international boundary line at the summit. Meanwhile work has been pushed ahead as rapidly as our force of men would permit on the Canadian side, and as fast as work is finished up on the U.S. side the men and camps are being moved to the Canadian side. A letter received to-day advises that about a thousand men are now at work beyond the summit.

Several miles of comparatively easy work are now ready for the track-layers on the Canadian side; but there is some heavy rock work just beyond the summit that must be done before any track can actually be laid. We hope to be able to push work all through the winter; but in any case there should be no difficulty in reaching Lake Bennett long before navigation opens in the spring, and meantime it will be easy to be able to forward goods and passengers by sleigh downhill over the snow from railhead to Lake Bennett.

The line we have built has nearly a uniform gradient of under 4 ft. in 100 ft., and has no curve exceeding 16 degrees. These figures excite universal surprise and admiration amongst men familiar with American mountain work. I will give you only one more illustration of what I mean by saying that we have preferred economy and safety of operation to economy of construction. The line from Skagway to the summit is an uphill pull of 20 miles long, with only a single track. If a train that had started from the bottom had to be allowed to reach the top before another train could start down, it is obvious that the capacity of the line would be much reduced. This could be obviated on a level line by sidings; but sidings on an incline are a source of great danger. By considerably increasing the cost of construction, we have succeeded in making several large level sidings, and thus have in effect cut our hill up into a number of smaller hills, separated by level places where trains can pass. These are only instances of what is apparent from the whole line, viz., that it was located and constructed to make a profit for the company operating the line, instead of for the contractors.

It is now certain that the capacity of the line will be taxed to the utmost in order to keep pace with the development of the Yukon country, and that the rates of freight will be so remunerative that the cheapest line in the long run is the best possible line that money can build..... The White Pass & Yukon Ry. [sic] is the key that is about to unlock the door to this rich country, and the key is now on the point of being turned in the lock. To-day we have the difficult part of our work done, our railway organized for business, and the governments of Canada, B.C. and the U.S. all most friendly. Having the trunk line between salt water and the river, we shall put in branch lines as feeders as fast as they are warranted by the condition of particular districts. Meanwhile the wonderful net-work of rivers and lakes take the place of branch lines, and all act as our natural feeders."

A PROPHETIC OBSERVATION

(Ry. & S. World, January, 1899)

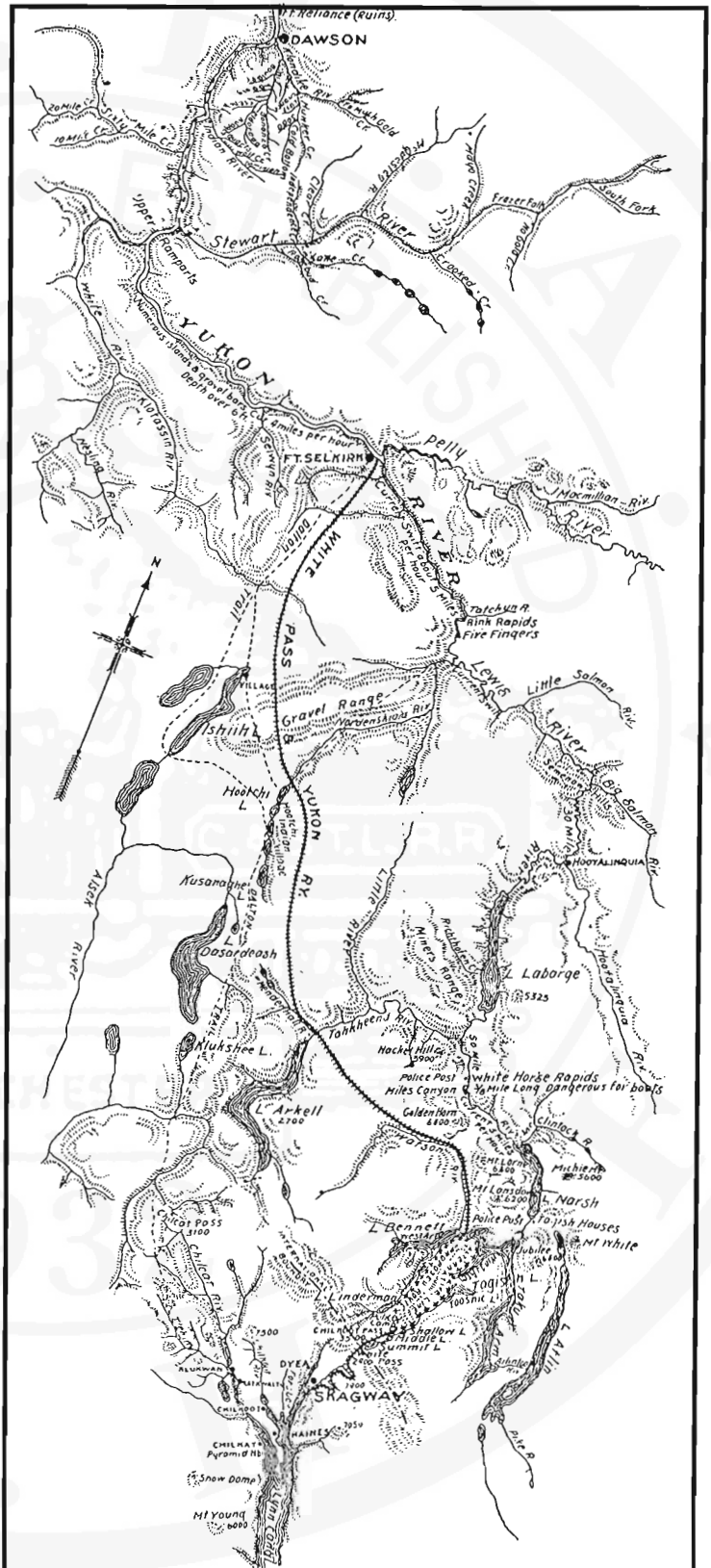
It makes very little difference what other routes shall be provided for reaching the Yukon, that by way of the White Pass will always be a great favorite. It is likely to be a great scenic route. Hitherto the tide of pleasure travel has turned back after visiting such pleasure points as could be reached by steamer. Hereafter it will be regarded as the correct thing to ascend the Pass by rail and probably take a run down the Yukon waters, visiting the Atlin district at least.

OVER THE SUMMIT

(Ry. & S. World, March, 1899)

In response to a request we have been furnished with the following interesting official information about this line, under date of Feb. 24.

Active operations on construction work were begun about June 1, 1898, and have been continued, without a break, since then. The summit of White Pass was reached with the rails on Feb. 15, 1899, and the Company is now operating 2



The route of the White Pass and Yukon Railway as originally planned. The Railway and Shipping World, March 1899.

miles beyond White Pass, making a total distance of rail opened for traffic of 22 miles from the Company's wharf at Skaguay. From Log Cabin to the summit, about 7 miles, will be completed by the end of February, ready for the steel. For 3 miles out of Skaguay to the summit of the pass has been continuous rockwork, upon which has been consumed nearly 350 tons of dynamite. One familiar with this class of work and the use of explosives can form a very fair idea of the magnitude of this class of construction.

The deepest open cut is 16 feet at Porcupine Hill, some seven miles from Skaguay by rail. The balance of the rock-work has mainly been side-hill work with the exception of one tunnel about 500 feet in length, which is about 16 miles from Skaguay by rail and was bored through a spur to avoid a sharp curve. The maximum grade of the road is $3 \frac{9}{10}$ ths %, which holds almost continuously for about 13 miles. Ballasting material, up to the present, has been obtained from the bed of the Skaguay River, near Skaguay, but now that the line is beyond the summit, vast quantities of the finest kind of gravel for ballasting will be hauled down grade and distributed from the summit to Skaguay to put the bed in first class condition.

The major portion of the ties is sawed ties of fir from the mills of Puget Sound. Only a small portion of the timber adjacent to the line of the road was suitable for ties. The rails are 56 lb. T steel, which is an unusually heavy rail for a narrow gauge (3 ft.) railway, and thus will enable a first-class alignment and grade to be maintained throughout the year. Sufficient rails are on hand to complete the line almost to Caribou Crossing.....

In an effort to expedite the work the Company purchased 3 second-hand narrow gauge locomotives in Seattle, which were formerly used on the Oregon Improvement Company's road from Seattle to its mines. These locomotives were thoroughly repaired and forwarded to Skaguay and have done excellent service in handling construction material. In July the Company purchased 2 more second-hand locomotives, which were in first-class repair, making 5 in service until February 1 when a 50-ton "Climax" geared locomotive (that was second-hand, although but six months old) was purchased and is now just about in service. In December an order was placed with the Baldwin Locomotive Works, of Philadelphia, for the construction of two, 45-ton, compound locomotives, equipped with the most modern appliances and of a consolidation type. The Baldwin works turned these locomotives out in less than 28 days from the time the order was received. These are now in transit between Seattle and Skaguay and will probably be in service by March 1.

The Company has also in service 6 passenger coaches and 1 baggage car, 30 box cars and 40 flat cars. The box and flat cars were framed in Seattle and sent to Skaguay in a knocked-down condition and there set up on trucks which had been purchased complete and ready for the car body. All the rolling stock is equipped with the Westinghouse air brake service, with all the latest improvements, also with automatic couplers. The Company will thus have in service by March 1, eight locomotives and the above enumerated rolling stock, which will be ample equipment to handle the vast amount of freight now offering and also enable it to forward its construction supplies. The Company has also a snow plow, which it constructed at Skaguay, and with which it has been enabled thus far to keep the entire line of track open. Next year it

will probably be found expedient to provide a rotary snow plow, as also to construct at various points snow fences and a few snow sheds. The major portion of the road, however, is so located as to be but little troubled by snow slides.

The Company has at Skaguay a large machine shop, equipped with the most modern and up-to-date machine tools, such as a 36 inch X 8 foot bed planer, a 42 inch swing engine lathe, another 22 inch swing engine lathe, a mortising and post-boring machine, a wheel press, a 38 inch drill press, emery wheels, band saws, a 25 horse power boiler and engine to run the machinery of the shops; blowers and blacksmith's forges, and a generally thoroughly equipped machine shop incidental to the requirements of a railway of this size. A large 2 story station has just been completed near the water front in Skaguay, the lower portion of the building being provided with a ticket office, baggage room, waiting rooms, telegraph operator's office etc., while the upper story has been designed for and is now occupied by the heads of departments and their assistants for the operating department of the road at Skaguay.

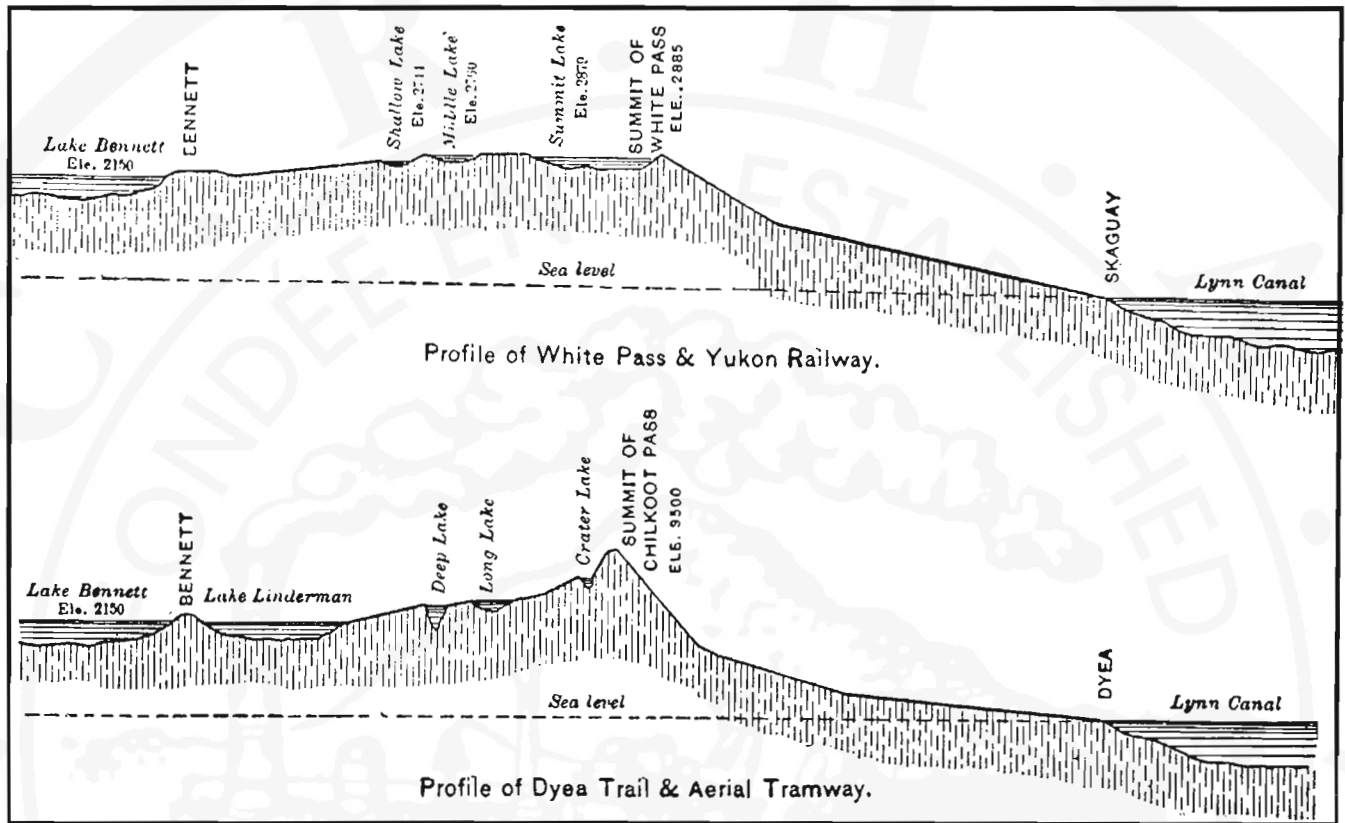
On the Company's wharf at Skaguay it has a large galvanized, corrugated iron warehouse and is now constructing a second one. Having a bonded privilege with the U.S. Treasury Department, the Company is thus thoroughly provided for the handling of bonded freight through Alaska for British Columbia and Northwest Territory points, and a vast amount of this freight is now being handled. The Company is also providing for the erection of 2 large corrugated iron warehouses at Lake Bennett for freight purposes.

The Company has constructed and has now completed and in operation a telegraph and long distance telephone line from Skaguay through to Lake Bennett, with instruments located at various points along that distance.

The preliminary survey for the road from Lake Bennett onward to Fort Selkirk was completed early last fall. A survey has also been completed for a branch line from Log Cabin to Atlin.

The road is already handling a vast amount of freight, there being at present over 600 tons in the warehouses at Skaguay awaiting transportation to the summit, where it is transferred from the end of the rail to 2-horse sleds, and by that means transported to Lake Bennett or to Atlin. The present general tariff, which is a special tariff for general merchandise etc., in car-load lots, is \$2.50 per 100 lbs., from Skaguay to summit of White Pass, or the end of the railway. From the end of the rail to Lake Bennett, the rate is \$2 per 100 lbs. The Company has appointed and located at Skaguay a customs agent who attends to the preparation of the customs papers incidental to the passage of bonded freight through Alaska territory, for which service a charge of \$1 is made for all papers for a shipment of 1 ton or less, or \$1.50 for a shipment of over 1 ton. By this means no delay is occasioned in the handling of bonded goods through the U.S. Customs Department at Skaguay.

The Alaska portion of the road has been constructed under the incorporated rights of the Pacific & Arctic Ry. & Navigation Co. of West Virginia, while the British Columbia portion is being built under the charter rights of the British Columbia - Yukon Ry. Co., and the road is operated under the general title to the public of the White Pass & Yukon Route.



Profiles of the White Pass and Yukon Railway, as well as that of the Dyea Trail & Aerial Tramway. These profiles were prepared by Frank Reid who was killed in the famous shootout with "Soapy" Smith on July 8, 1898, in which Smith also died.

The Railway and Shipping World, October 1899.

ON TO LAKE BENNETT

(Ry. & S. World, October, 1899)

About 1 1/2 miles of snow sheds are being built on the line between Skagway and Lake Bennett. A rotary snow plough has been purchased, and the management expresses the hope that it will be possible to operate the line throughout the winter. This Company's present line extends from Skagway to Lake Bennett, 41 miles. In the extension of the line towards Fort Selkirk, the water stretches are evidently to be used, at first at least, as much as possible. The route along the east side of Lake Bennett, some 27 miles, is very heavy, and not likely to be gone on with for some time, until Dominion or Provincial aid is secured. A contract has been let to Mr. Heney, of Ottawa, Ont., for the construction of the line from Cariboo Crossing [now Carcross], at the northeast end of Lake Bennett, and between Lake Bennett and Lake Nares, by way of the Watson Valley to the Lewes River below the White Horse Rapids, some 40 miles. Grading has been started, rails have been shipped from Vancouver, and as the work is comparatively easy, there not being much rock or heavy cuttings, it is hoped to have this section built by the opening of navigation next spring. It will do away with the necessity of making portages and transferring from steamer to steamer at the rapids. Pending the completion of the line along the east side of Lake Bennett, transfer barges are likely to be used to convey cars across the lake.

The Chilkoot aerial tramway, owned by the W. P. & Y. R. Co., has been put in good repair recently; 2 towers have been replaced, the wire cable, where worn, has been repaired, and snow sheds have been constructed at several points. The engineers have been retained at the power station, and it is expected the tramway will be used during the winter should the steam railway become blocked by snow.

THE ENGINEER AND THE ROAD TO THE YUKON GOLD FIELDS

By Harrington Emerson

(Ry. & S. World, October, 1899)

[Note: Only those portions of the article of interest to the history of the White Pass & Yukon Route have been included here. Ed.]

(The following article, which was written in March last [1899], deals with matters from a United States standpoint, which makes all the more forcible the remarks about the difference between the Canadian and U.S. governments in regard to aids to navigation and in attention to frontier matters. The admission that the White Pass & Yukon Ry. will divert the trade of the Yukon from U.S. to Canadian channels is significant.... Since the article was written the W.P. & Y. Ry. has been completed to Lake

Bennett, 41 miles from Skagway, and is now in operation, giving connection at Bennett with the river steamer service to Dawson. Editor of Ry. & S. World).

He who leaves what is generally termed the Pacific Coast for the Klondike and the Alaska gold fields, enters another world when he boards the north-bound steamer..... Owing to the absence of parasites, industrial, criminal and governmental, it was cheaper and safer to go to the Yukon ten years ago than it was when the great work was on, and were it not for the works of the engineer, the passage down or up the Yukon would to-day be lined with as many robber roosts, levying blackmail, euphemously called toll, on all the travel and traffic, as was the Rhine in the middle ages. But the engineer, with his ocean steamers, wharves, railroads, aerial cableways, river boats, etc., came and converted what was once an expedition of extreme physical danger and hardship, and what next became a journey of extreme pecuniary danger and expense, into a rapid, safe, convenient and also cheap trip to the Arctic Circle.....

The profiles here given, showing the two lowest passes from ocean to river, were drawn from his own surveys by Frank Reid, the engineer, who, at Skagway in 1898, in the cause of decency, order and law, shot and killed "Soapy Smith", the leader of all the crooks and thugs with which the place was infested, and was in turn killed by him. Of all the many dead claimed by the dangers and diseases and the murderous trails, Reid alone rests under an imposing monument, erected in the forlorn little cemetery to show the gratitude of the citizens and as a permanent warning to evil-doers. The man was honored who had saved the town from a reign of terror, but the engineer began a greater work in his surveys, which were the beginning of a development, that in 18 months replaced the Indian hunter's foot-path with aerial cableways and a steam railway.

The profiles are worth studying. Lynn Canal is an inlet or fjord of the Pacific Ocean, and the lakes over the summits are the head lakes of the Yukon River. Although these summits are but 14 miles from the ocean, the distance down the Yukon to Bering Sea is 2000 miles. Nowhere else in the world are the navigable head waters of a great river so near the same ocean into which it finally empties. It is as if the headwaters of the Ohio River were but 14 miles from New York Bay.....

Between the final triumph of modern engineering, the railroad, and the natural highway of the Indian, there were many stages of improvement which were more toilsome, dangerous and expensive than the conditions they were supposed to better. However there was no longer easy and sympathetic acquiescence to nature's whims when the great gold rush to the Yukon began in August 1897..... Over 12,000 people landed at Skagway in the first year after the rush, or between August 1897 and July 1898. Most of those unfortunates crossed the pass dozens of times carrying their goods in relays, a man load at a time, a slow way of transporting a ton or two of supplies a distance of 30 miles over almost impassable trails.....

In August, 1897, work was started on the Chilkoot R.R. & Transportation Co., on the Alaska R.R. & Transportation Co, and on the Dyea Klondike Transportation Co.; all three of them aerial cable trams. These three were ultimately consolidated into the Chilkoot Pass route, and but one line finished in April, 1898. A large force of men was kept busy all winter, but very little beyond

shovelling snow was accomplished from December 10, 1897 to March 15, 1898. The tram begins 9 miles from Dyea at Canyon City, to which place a wagon road is almost without grade. There are 2 loops, 1 from Canyon City to Sheep Camp, 4 miles, and the other from Sheep Camp over the summit and 1/4 mile down the other side. This loop is 4 1/4 miles long. The trolley automatically switches from one loop to the other, and the load is limited to 400 lbs., generally carried in boxes 40 X 20 X 24 inches. With its level road and these trams in operation, the Dyea trail should and could have beaten its rival Skagway as to rates, but it could not handle the freight offered.....

During the summer of 1898 pack trains were in full operation over the White Pass, and the trams over the Chilcoot, and the healthy rivalry between them prevented too great extortion..... But a new competitor now appeared in the field that was for all time to settle the supremacy of Skagway. The newcomer was the international railroad, whose survey ran 20 miles through U.S. territory from tide water at Skagway to the summit of the pass and the international boundary, and thence 325 miles to Fort Selkirk, on the Yukon River, below White Horse Rapids and other dangers, and but 174 miles beyond Dawson. [Editor's note. The extension to Fort Selkirk was never built, but the line was completed to Whitehorse in 1900.].....

The railway is a great example of engineering and constructive skill. It would have been a great feat to grade 40 miles and build twenty over a similar rocky pass under the most favorable conditions, but this work was done in seven months, in a region without laborers, 1000 miles from supplies, 3000 to 4000 miles from rolling mills and car shops, and against fearful climatic conditions. Day after day fresh snow drifted over the road-bed and day after day it had to be shovelled off, sometimes to a depth of 6 to 8 feet. Supplies, bridge timbers, fire-wood even, for the enormous camps had to be carried over almost impassable snow trails. There were days when men could not work on account of the storms or the intense cold, but they had to be fed and warmed.

The road begins on deep water, a mile from Skagway. A shelf is blasted along the face of the cliff, and this beginning is typical of the 20 miles to the summit. High above the valley, on a maximum grade almost the whole distance, the road sweeps around two different forks of the Skagway River, adding 6 miles to its length, but making it possible to reach the summit of 2885 feet without switch back..... The road is narrow gauge, but the road bed and construction are adapted for standard gauge. It is one of the most solid and substantial road beds in America.....

A serious result of the completion of this railway to the summit is the inevitable diversion of a trade, thus far almost exclusively in U.S. hands, to Canadian points and houses.....

The Klondike madness is past. In two short years the savage trail with a dozen Indian packers has been replaced with transportation facilities with a capacity exceeding the requirements of the Yukon basin for years to come. This excess will stimulate further developments. The country offers the widest field, for it is inexhaustibly rich. Nowhere else as on this gold trail has the genius of engineers wrought such beneficent and rapid change in so short a time. The evolution from hunter's path to railroad, through the intermediate steps of pilgrim path, mule trail, wagon road, was 2000 years in making in the St. Gotthard Pass, the great high road

between the most civilized portion of the ancient world and of the mediaeval world, the road that led from the gloomy north to the rich south, rich in treasures, in food, in spiritual tradition and comfort. Two short years as against 2000 have evolved the same succession of improvements on the highway over the White Pass back to a north, hideous in climate, without history, without sentiment, without food, but abounding in gold.

CONTINUING ON TO WHITEHORSE

(Ry. & S. World, December, 1899)

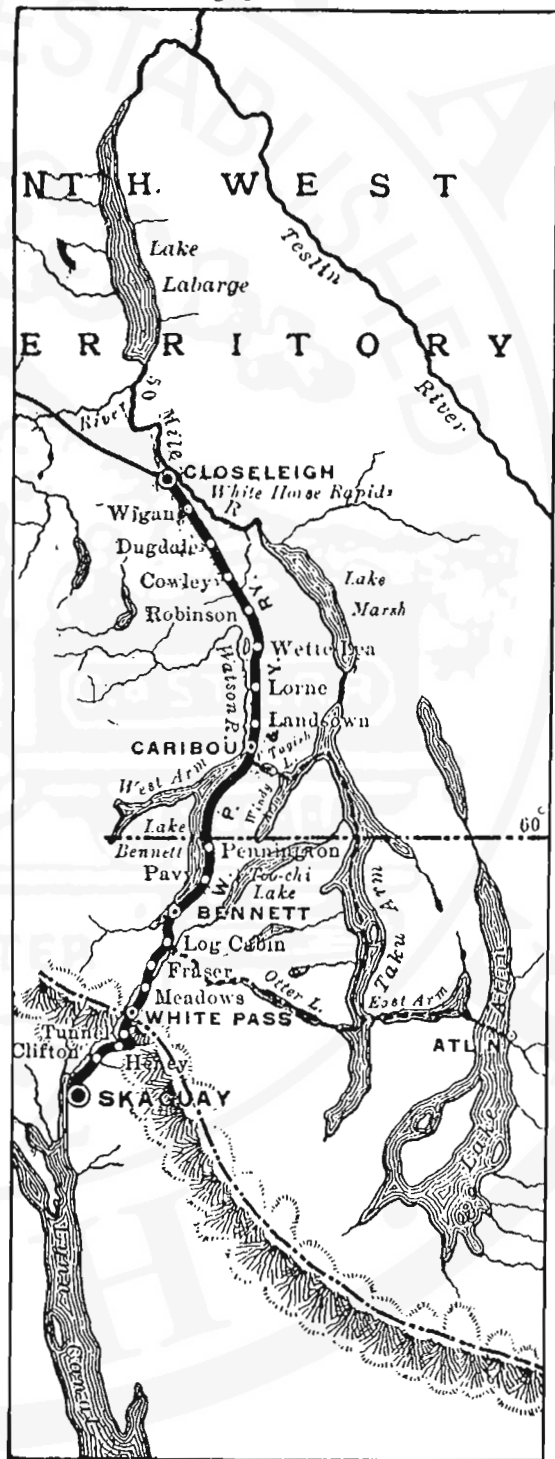
The following official information about the section between the north end of Lake Bennett and White Horse Rapids, was furnished us under date of Nov. 14,

The route from Bennett lies along the east shore of Lake Bennett; the first 12 miles being very heavy rock work - precipitous mountain peaks running directly into the deep water of the lake. The other 15 miles of the 27 are along ordinary mountainside, and are of more easy or average construction. At the north end of Lake Bennett, at what is known as Caribou Crossing, a bridge about 500 ft. long will be put in with a draw span so as not to interfere with the navigation of the lakes and river. From Caribou Crossing to a point on the river below White Horse Rapids, at the new townsite of Closeleigh [today Whitehorse, Ed.], a further distance of 44 miles, the conditions are as follows: The first 13 miles cross a rolling sand-hill country with occasional marshes, being remains of old glacier lakes. Wherever the ground is covered with moss and timber the glacial ice is still encountered in the gravel at a depth of 2 feet under the moss. Fifteen miles from Caribou Crossing 2 high bridges cross the canyon at the lower end of Lewis Lake. This lake was drained by an earth cut and lowered 75 feet. The road then passes along the east shore of Lewis Lake, crossing former islands and peninsulas, and is of quite remarkable location. At the upper end of Lewis Lake we again get out into the Waterson River valley by a series of deep gravel cuts. From Lewis Lake on there are several miles of nearly level grade and light work along the valley. The line then passes along the shores of Ruth Lake and Cougar Lake and approaches the banks of the Lewes River, in the vicinity of Miles' Canyon. The road is here in very heavy cuts and fills, passing through a series of knolls and deep depressions left by the former glaciers. Just beyond the White Horse Rapids the road is placed on a bridge under a steep sand bluff for about 1/4 mile, and then emerges on a broad level bench at Closeleigh, in the vicinity of the enormous copper mines which lie at a distance of about 2 1/2 or 3 miles, in almost semicircular form. The gradients on the line between Bennett and Caribou will be a maximum of 1 1/2%, although the line as first established will have a very few sections of 2% grade, to be taken out in the near future. Maximum curvature 10 degrees. M.J. Heney, of Bennett, B.C. is the contractor.

At this writing about 30 miles of the work have been graded between Caribou and Closeleigh. Work will be continued all winter. Construction along the lake-side will be commenced by November 20. One engine and work train are now on the track at Caribou. Track-laying will be commenced about November 20, and continued for a distance of 17 miles this fall. The balance of the track will be laid when navigation opens in the spring. The work between Caribou and White Horse is expected to be finished and in operation by June 1. The section along the lake-shore will

be put in operation some time in July next. In the meantime goods will be transferred by steamers between the ends of track, Lake Bennett being considered a long ferry.

[Editor's note: The two tracks came together at Carcross on July 29, 1900, completing the railway from Skagway to Whitehorse. This was as far as it ever got].



*The White Pass & Yukon Route as built.
Railway and Shipping World, December, 1899.*

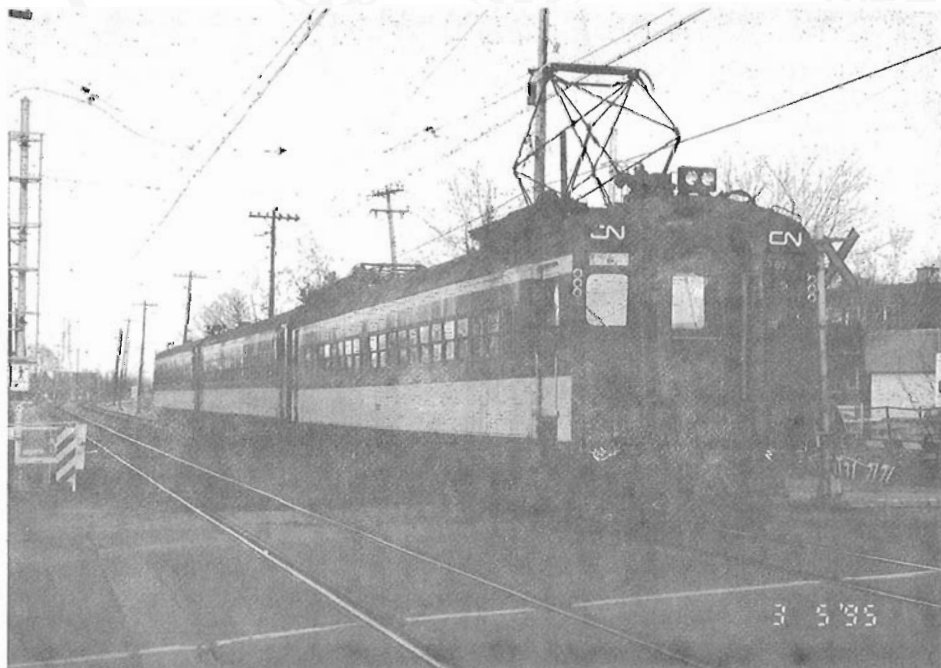
The End of the Old CN Electrics

By William J. Radford

Well, last June 2nd, 1995 came and went. It was the Montreal - Deux Montagnes commuter train's "Grand Finale" under the 3 Kv. D.C. line. I, along with my dad, invited Steve Walbridge to come with us to witness the great event. So the three of us watched the last three commuter trains. First we went to Roxboro to see the last Roxboro - Montreal departing at 1832 (6:32 P.M.). This train consisted of six CN Multiple Unit cars (6747, 6741, 6733, 6739, 6742, 6730). Then it was on to Val Royal to see the final Val Royal - Montreal local service, train 918, which departed six minutes late at 1906, again CN M.U. cars (6744, 6745, 6735). Then train 951 arrived from Montreal, hauled by the two oldest locomotives in service, 6710 and 6711. As it passed 918 they whistled at each other for the last time. It was the last day for Val Royal station which closed just after the last train passed. The three of us then went to the station at Laval Sur le Lac and arrived just in time to see the train depart in reverse to the Des Prairies siding. This move was necessary since trackwork prevented the train from continuing on to Deux Montagnes. At Des Prairies,



the 6710 and 6711 ran around the train and proceeded back. After a brief stop at Ste. Dorothee, the train headed back towards Montreal.



For the last few weeks before the last run, railway enthusiasts and others had been photographing and riding the old trains. This activity increased in the last week, and especially the last day. The morning of June 2 was bright and sunny, and those who rode the line had great opportunities for excellent photos. Unfortunately the weather was not as good in the afternoon, and most of the runs took place in the rain. However the turnout was even greater than in the morning as all appreciated the historical importance of the occasion. When the last train arrived back at Central station, there was a great deal of picture taking (and even a presentation of a birthday cake to the engineer!). Then it was time to leave, and those present slowly departed, with many a backward glance. After 76 years, 7 months and 12 days the venerable equipment had reached a well-earned retirement.

**Societe de Transport de la Communaute Urbaine de Montreal
Tribute to the Montreal - Deux-Montagnes Commuter Train Line
June 2, 1995 saw last Vintage Equipment**

Morning Rush Hour Vintage Equipment Finals - June 2, 1995

(William J. (Willie) Radford)

**Last Roxboro - Montreal
Commuter Train consist**

STCUM, Train 930,
Elect Eng CN 6716,
Elect Eng CN 6723,
VIA Snack-bar Coach 3232,
VIA Coach 5580,
VIA Coach 5486,
VIA Coach 5485,
VIA Coach 5518,
VIA Coach 5503 ..
(2 Elect Engs, 6 Cars)
Departed Roxboro stn. at
0712 EDT, on CN at mile
5.1 Montfort Subdivision.

**Last Laval - Montreal
Commuter Train consist**

STCUM, Train 932,
Elect Eng CN 6714,
Elect Eng CN 6712,
VIA Snack-bar Coach 3215,
VIA Coach 5533,
VIA Coach 5455,
VIA Coach 5443,
VIA Coach 5482,
VIA Coach 5439,
VIA Coach 5501 ..
(2 Elect Engs, 7 cars)
Departed Laval stn. at
0754 EDT, on CN at mile
9.2 Montfort Subdivision.

**Last Val Royal - Montreal
Commuter Train consist**

STCUM, Train 910,
Multiple Unit Cars
CN 6747 (trailer),
CN 6741 (trailer),
CN 6733 (motor),
CN 6739 (trailer),
CN 6742 (trailer),
CN 6730 (motor) ..
(6 MU Cars in total)
Departed Val Royal stn. at
0857 EDT, on CN at mile
7.1 Mont-Royal Subdivision.
Also the final Morning rush
hour train into Montreal.

Evening Rush Hour and the Vintage Equipment Finale- Finals - June 2, 1995

(Robert W. (Bob) Radford, William J. (Willie) Radford, A. Stephen (Steve) Walbridge)

**Last Roxboro - Montreal
Commuter Train consist**

STCUM, Train 950,
Multiple Unit Cars
CN 6747 (trailer),
CN 6741 (trailer),
CN 6733 (motor),
CN 6739 (trailer),
CN 6742 (trailer),
CN 6730 (motor) ..
(6 MU Cars in total)
Departed Roxboro stn. at
1832 EDT, on CN at mile
5.1 Montfort Subdivision.

List made by William J. (Willie) Radford

Member: Canadian Railroad Historical Assoc. - 2057

-Toronto & York Divn.- 312 Kingston Divn.- 35

**Last Val Royal - Montreal
Commuter Train consist**

STCUM, Train 918,
Multiple Unit Cars
CN 6744 (trailer),
CN 6745 (trailer),
CN 6735 (motor) ..
(3 MU Cars in total)
Departed Val Royal stn. at
1906 EDT, on CN at mile
7.1 Mont-Royal Subdivision.
Val Royal stn. is located in
Ville de (City of) St-Laurent, QC

**Last Laval - Montreal
Commuter Train consist**

STCUM, Train 952,
Elect Eng CN 6710,
Elect Eng CN 6711,
CN Coach 5070,
CN Coach 5065,
CN Coach 5063,
CN Coach 5062,
CN Coach 5064 ..
(2 Elect Engs, 5 Cars)
Final Deux-Montagnes -
Montreal line Vintage
Commuter train that
departed Ste-Dorothee stn.
at 1955 EDT, on CN at mile
7.9 Montfort Subdivision.

OPPOSITE, TOP: A vanished scene! Hooping up the orders to the engineer of car 6746 at Val Royal on May 2, 1995.

OPPOSITE, BOTTOM: Car 6730 is the rear car of a three-car train heading west, departing from Monkland on May 3, 1995. Both cars 6746 and 6730 are destined for the South Carolina Railroad Museum, located near Winnsboro, S.C.

Both photos by Fred Angus.

Societe de Transport de la Communaute Urbaine de Montreal

Montreal - Deux-Montagnes (CN) Commuter Line Equipment Roster 1982-1995

Roster as of June 1995 include Class and Numbers in **BOLD**

William J. (Willie) Radford

Member: Canadian Railroad
 Historical Assoc. - 2057
 -Toronto & York Divn. - 312
 -Kingston Divn. - 35

1. Electric Locomotives

CANADIAN NATIONAL RAILWAYS General Electric Box-Cab model 0440-E-166-4-GE-228-A
 H.P.: 1100 Weight: 174,000 lbs Wheel Arrgmt: B+B
 Cont. Tractive Effort: 19,600 lbs Max. Safe Speed: 55 MPH (88km/h)

Class: **Z-1-a** CN (1919-); CNoR (New-1919)

Number:	Serial No:	Date Blt:	Retired:	Historical Notes:
CN 6710	4608	1914	-	100 (1949-1969); 9100 (1919-1949); CNoR 600 (New-1919)
CN 6711	4609	1914	-	101 (1949-1969); 9101 (1919-1949); CNoR 601 (New-1919)
CN 6712	4610	1914	-	102 (1949-1969); 9102 (1919-1949); CNoR 602 (New-1919)
	4611	1914	CN 6713 (1993)	6713 (1969-1993); 103 (1949-1969); 9103 (1919-1949); CNoR 603 (New-1919)
CN 6714	4612	1917	-	104 (1949-1969); 9104 (1919-1949); CNoR 604 (New-1919)
CN 6715	25326	1918	-	105 (1949-1969); 9105 (1919-1949); CNoR 605 (New-1919)

Notes: -CN 6715 was built at Canadian General Electric (now General Electric Canada) Plant in Peterborough, Ont.
 -All Box-Cab model 0440-E-166-4-GE-228-As were delivered to the CANADIAN NORTHERN RAILWAY in 1917.
 -CANADIAN NORTHERN RAILWAY No. 601 was the first Electric Locomotive to haul the first revenue train through the Mont-Royal (Mount Royal) Tunnel on October 21, 1918.
 -Current class Z-1-a numbers 6710-6715 were applied in 1969 being renumbered from 100-105.
 -CN 6713 retired in 1993 and has been cannibalized for spare parts to supply remaining class Z-1-a locomotives.

CANADIAN NATIONAL RAILWAYS English Electric/Beyer Peacock Box-Cab models
 H.P.: 1100 Weight: 202,000 lbs Wheel Arrgmt: B+B
 Cont. Tractive Effort: 21,400 lbs Max. Safe Speed: 50 MPH (80km/h)

Class: **Z-4-a** (CN 1943?-)

Number:	Serial No:	Date Blt:	Retired:	Historical Notes:
CN 6716	582/6234	1924	-	180 (1949-1969); 9180 (1943-1949); NHB 101 (New-1943)
	583/6235	1924	CN 6717 (1993)	CN 6717 (1969-1993); 181 (1949-1969); 9181 (1943-1949); NHB 102 (New-1943)
CN 6722	698/6330	1926	-	186 (1949-1969); 9186 (1943-1949); NHB 107 (New-1943)
CN 6723	699/6331	1926	-	187 (1949-1969); 9187 (1943-1949); NHB 108 (New-1943)
CN 6724	700/6332	1926	-	188 (1949-1969); 9188 (1943-1949); NHB 109 (New-1943)

Retired pre STCUM service:

584/6236	1924	CN 6718 (1971)	CN 6718 (1969-1971); 182 (1949-1969); 9182 (1943-1949); NHB 103 (New-1943)
585/6237	1924	CN 6719 (1971)	CN 6719 (1969-1971); 183 (1949-1969); 9183 (1943-1949); NHB 104 (New-1943)
696/6328	1925	CN 6720 (1971)	CN 6720 (1969-1971); 184 (1949-1969); 9184 (1943-1949); NHB 105 (New-1943)
697/6329	1926	CN 6721 (1971)	CN 6721 (1969-1971); 185 (1949-1969); 9185 (1943-1949); NHB 106 (New-1943)

Notes: -CANADIAN NATIONAL RAILWAYS received these nine (9) British built Box-Cab Electric Locomotives in trade for ten (10) Steam Switchers with the NATIONAL HARBOURS BOARD (now PORTS CANADA) in approximately 1943 for the purpose hauling Passenger trains in and out of Montreal (Central station) and later began hauling Commuter trains.
 -Four (4) Box-Cabs were retired in 1971, long before STCUM-service began, they were used as spare parts for remaining units. No. 6717 retired in 1993 and cannibalized for spare parts for four (4) remaining units.
 -Current class Z-4-a numbers 6716-6724 were applied in 1969 being renumbered from 180-188.
 -Beginning in 1983, the Box-Cabs were restricted to a maximum of 35 MPH (56km/h) in service.

THESE TWO PAGES: Some data on the history of the electric locomotives and multiple unit cars used on the Montreal electric line. Where the term "New" is used, it refers to the date the unit was built. For example, the entry for 6730 shows M-1 (New-1969). This means that the car was numbered M-1 from when it was new (1952) until 1969.

CANADIAN NATIONAL RAILWAYS General Electric 86 Ton Center-Cab Electric
 H.P.: 1200 Weight: 172,000 lbs Wheel Arrgmt: B-B
 Cont. Tractive Effort: 17,900 lbs Max. Safe Speed: 60 MPH (96km/h)
 Class: **Z-5-a**

Number	Serial No:	Date Blt:	Retired:	Historical Notes:
CN 6725	30357	1950	-	200 (New-1969)
CN 6726	30358	1950	-	201 (New-1969)
CN 6727	30359	1950	-	202 (New-1969)

Notes: -Current class Z-5-a numbers 6725-6727 were applied in 1969 being renumbered from 200-202

2. Multiple Unit Cars

CANADIAN NATIONAL RAILWAYS Canadian Car & Foundry Multiple Unit Cars- Motors
 H.P.: 1050 Weight: 157,000 lbs Wheel Arrngt: B-B
 Cont. Tractive Effort: 15,200 lbs Max. Safe Speed: 65 MPH (104km/h)
 Class: **EP-59a** Date Built: 1952

Number	Retired:	Historical Notes:	Number:	Retired:	Historical Notes:
CN 6730	-	M-1 (New-1969)	CN 6734	-	M-5 (New-1969)
CN 6731	-	M-2 (New-1969)	CN 6735	-	M-6 (New-1969)
CN 6733	-	M-4 (New-1969)	<i>Retired pre STCUM service:</i> CN 6732 (c1980) CN M-3 (New-1969)		

Notes: -Motor cars with a Control Cab at the front end
 -Current class EP-59a numbers were applied in 1969 being renumbered from M-1 - M-6
 -MU Car 6732 was retired sometime in 1980-1982 before STCUM service began in July 1982.
 -The five (5) remaining cars were overhauled including Rib supports added in 1989-1990
 -MU Cars were leased by Quebec Ministre des Transports beginning in July 1982 for STCUM service.

CANADIAN NATIONAL RAILWAYS Canadian Car & Foundry Multiple Unit Cars- Trailers
 H.P.: - Weight: 92,000 lbs Wheel Arrngt: 2-2
 Cont. Tractive Effort: - Max. Safe Speed: -
 Class: **ET-59a** Date Built: 1952

Number:	Retired:	Historical Notes:	Number:	Retired:	Historical Notes:
CN 6739	-	T-12 (New-1969)	CN 6745	-	T-6 (New-1969)
CN 6740	-	T-1 (New-1969)	CN 6746	-	T-7 (New-1969)
CN 6741	-	T-2 (New-1969)	CN 6747	-	T-9 (New-1969)
CN 6742	-	T-3 (New-1969)	CN 6748 (1993)		T-10 (New-1969)
CN 6743	-	T-4 (New-1969)	CN 6749	-	T-11 (New-1969)
CN 6744	-	T-5 (New-1969)	<i>Retired pre STCUM service:</i> CN T-8 (1960) CN T-8 (New-1960)		

Notes: -Trailer cars with a Control Cab at the front end, powered by Motor Cars in class EP-59a
 -Current class ET-59a numbers were applied in 1969 being renumbered from T-1 - T-12 except T-8 that was retired and scrapped in 1960 after a head on collision with a Freight train in Pierrefonds, Que. at A-Ma-Baie station (Mile 3.5 Montfort Subdivision), in April 1960 long before STCUM service began in July 1982
 -Ten (10) cars were overhauled including Rib supports added in 1989-1990, Car 6748 never underwent overhaul.
 -MU Car 6748 was retired in 1993 after taken out of service in 1989, various parts were used to supply the 1988-89 overhauled cars, therefore the Car itself was never overhauled.
 -MU Cars were leased by Quebec Ministre des Transports beginning in July 1982 for STCUM service.

NEXT TWO PAGES: Four excellent photos of the last days of the CN commuter operation.

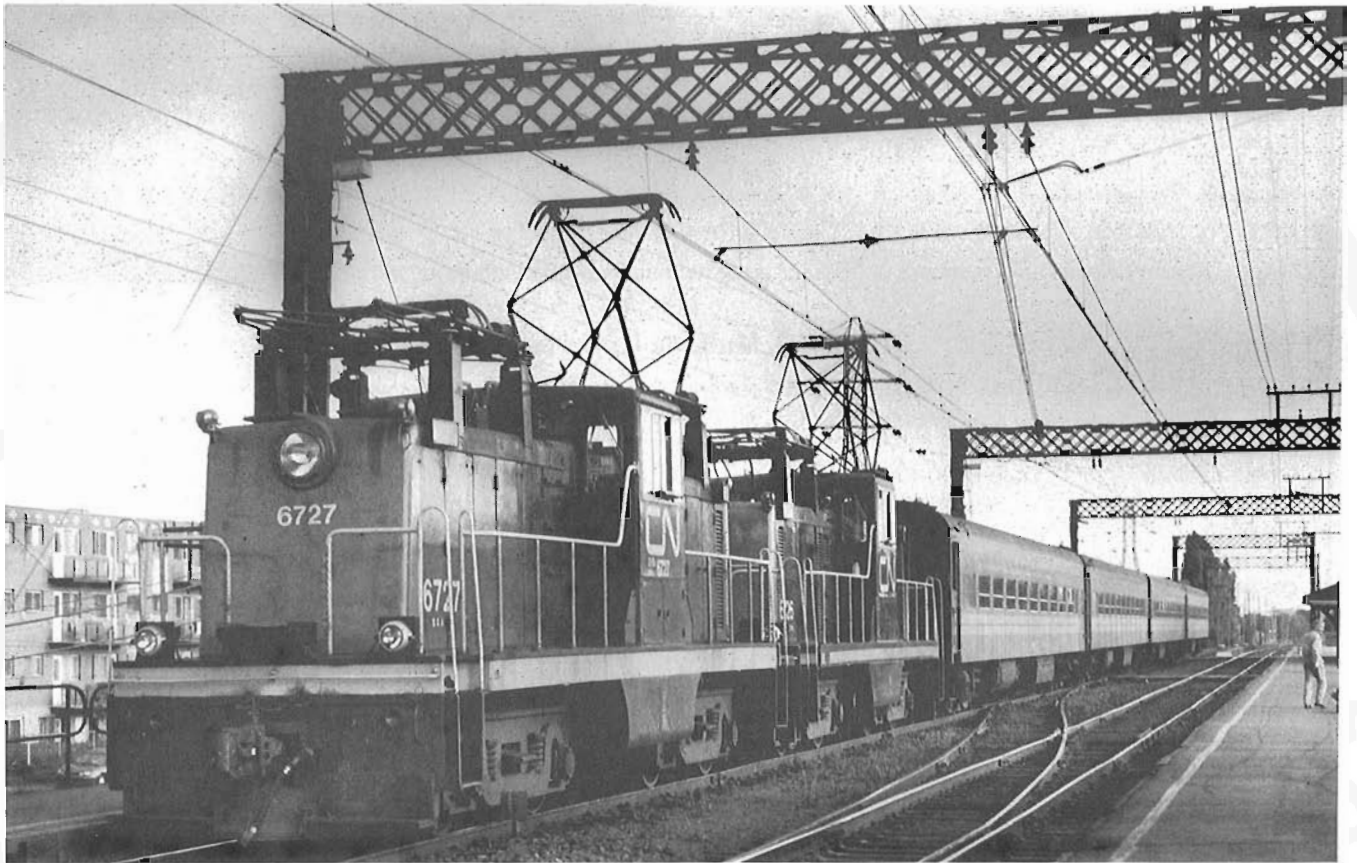
PAGE 200, TOP: Centre cab units 6727 and 6726 on the point of a westbound commuter train at Val Royal on Friday, May 25, 1995.

PAGE 200, BOTTOM: In the last year of operation of the commuter trains, CN assigned some GP9u diesels to assist during peak hours. Here we see 7072 on a westbound commuter train at Val Royal on Friday, May 25, 1995.

PAGE 201, TOP: The last westbound trip for the CN electric service. Train 951, hauled by 6711 and 6710, at Monkland on June 2, 1995. Note the special logo, in the style of the old Canadian Northern herald, commemorating the first and last days of operation, 1918 - 1995.

PAGE 201, BOTTOM: In the pouring rain, the last eastbound (train 952) passing Ile Bigras station en route to Montreal, and retirement.

All four photos by Pierre Ozorák.







A sad end! The demolition of Val Royal station on June 5, 1995, less than three days after the end of service of the old CN electrics. Such was the end of a site beloved by railfans for many years.

Photo by Frank Hermann.



Some of the old locomotives at Montreal's Taschereau Yard on September 12, 1995. 6712 is destined for display at the Town of Mount Royal. The fate of the others is uncertain.

Photo by Fred Angus.

Museum Notes

By John Godfrey

September 9th, 1995

Over what has been a rather steamy summer in the Montreal area, life has gone on at the Canadian Railway Museum.

Port of Montreal 1002 went back to work at the beginning of July after completion of the cylinder work mentioned previously. Earlier in June, MTC 1959 spent some unexpected time in the shop with more compressor woes. Its place was taken on dry days by MTC 3, back in service after repairs to its current collection system.

The shop itself has been a rather empty place most of the season; the only permanent residents being CP reefer 284845 (still uncompleted) and a second-hand front end loader / back hoe recently acquired from the City of St. Constant (Its starter was mysteriously inoperative upon delivery). The CN 15824, expected to enter the shop over the summer, is still in its spot in building 2.

During the month of May, the quality of descriptive signs was improved in both the display buildings, and building 1 itself was spruced up with some paint and the installation of asphalt walkways. Elsewhere on the property, portable toilets were located behind building 1, and there were more places for the visitor to sit and rest, which is beneficial to the Museum's older visitors.

Also in May, sequences were shot for the NBC TV movie "Zoya" which was aired on that network September 17. The CRHA's CP 38 and 51, SNCF "St. Malo", CN 5702 and GT 713 made appearances. All scenes were shot inside building 1.

By the middle of June, the concreting of the turntable walls had been completed. As was expected, operation of this important piece of trackage has been rendered much easier as a result. However, the proposed restoration job to Barrington Station has yet to begin. The turntable's grand unveiling came on June 5th, at a "grand opening" staged for various political officials and others of influence in the community as a means to make them aware of the Museum's present and future needs.

Perhaps the most significant was held on June 10th, when CN transferred title to five pieces of equipment from the Two Mountains line to the CRHA. CN, Montrain, Museum and CRHA officials presided at a short ceremony on the Hays platform, after



Diesel, electric and steam locomotives of the CNR appear in this photo taken at the Canadian Railway Museum in June, 1995. The latest arrival is, of course, the venerable electric unit No. 6711, which occupies centre stage.

Photo by Walter Bedbrook.

which the equipment was switched into the yards. Now on site are MU cars 6734 and 6742 (originally M-5 and T-3), coaches 5062 and 5064, and box cab locomotive 6711 (originally 601, later 9101, and still later 101). The final selection of equipment came about after a joint inspection of the entire fleet of locomotives, MUs and cars in Central Station last March. This was done by representatives of Montrain and the Museum during the time when all the equipment was in the station due to the national railroad strike. The day after the equipment was transferred to the Museum, 5064 became the regular coach on the passenger train.

Over the course of the summer, an evening streetcar night, a model train show, and a diesel weekend were held at the site and were well received by the few that found out about them and attended.

During the summer, operation carried on more or less as usual. The work on the "John Molson" was put off until August so as to permit operation of the locomotive over the peak tourist season. As of this writing, work is completed and the engine is expected to operate the Sunday of Thanksgiving weekend (October 8). Daily streetcar service was also provided despite two very minor derailments. Passenger service also never missed a day, though at times trains short turned at Ouellette Street due to a tie replacement program further east on the line to Des Bouleaux.

In July, Supervisor of Train Operations, Roger Desautels resigned for personal reasons. Roger, who has spent over 30 years at the Museum, will continue to serve as a volunteer. A great "Thank You" goes out to him for his many contributions to the operation of equipment and his ability to serve as a "go between" with the various media who come to the Museum.

During the month of August, the Museum was inspected by Transport Quebec, under whose jurisdiction the operation of equipment falls. Association members may be happy to learn that the Museum passed with flying colours. The inspector noted that

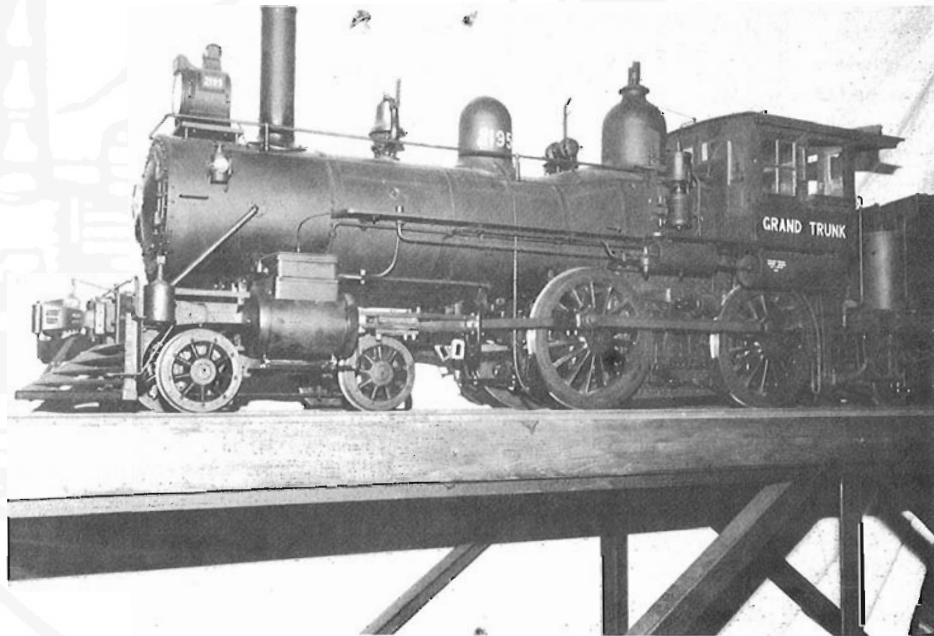
the overall quality of operation, as well as the state of Museum trackage, exceeds provincial norms.

During the last days of summer, scenes for a Radio Canada TV show were also shot on site making use of GT 713, CP 1554, CP 51 and CP "Neville". Air dates are not known at this time.

October 15th marks the closing of the site to the public. However, that does not mean that nothing will go on until next year. There are locomotives to maintain, pieces in the collection to restore, etc. If you live in the greater Montreal area, why not come and lend a hand?

A Steam Locomotive Model To the Canadian Railway Museum

By Walter Bedbrook



THIS PAGE AND OPPOSITE: Three views of the one-eighth size model of GTR 2195, showing all the fine detail.

The Association is indeed fortunate that many members correspond with the executive and other members, seeking information in some cases, and also passing along railway news or historical activities from wherever they live.

One such letter addressed to the Association stated in part:

"Dear Sir, I have a one and one half scale model of an old Grand Trunk Railway, American Standard locomotive which I built over a period of years. It is presently in my workshop at home and I have been thinking lately that it really should be somewhere where it could be properly displayed as a historical exhibit.

As a C.R.H.A. member I feel that the Railway Museum would be the logical place. If a donation is made to the Museum, what is the usual procedure that takes place, such as; whether the Museum wishes to accept the engine or not, and if so what kind of arrangement would be made for getting it there safely, and would it be properly looked after from then on? I've enclosed some photographs to give you a general idea of what it looks like.

Let me know if the Association is at all interested.

Sincerely, Edward Farley."

Interested? - Overjoyed, to put it mildly!

Arrangements were immediately made with Ed to see the model and make arrangements to move it to the Canadian Railway Museum. When all was in order, it was moved by truck from Burlington, Ontario directly to the Museum, and it arrived there on August 5, 1995.

It was then unloaded and reset on its display stand inside baggage car 3987 in Building No. 1. 3987 has been fitted out as a model train display car, and is constantly supervised when the Museum is open to the public. It now rests there as the prime exhibit in the car.

Ed Farley, now retired, was a locomotive engineer who worked out of Hamilton for 20 years, and another 14 years in Toronto at Spadina. He ran on every type of steam locomotive owned by CN, save the large 4100s (they worked east of Toronto and Ed's runs were always to the west).

The model locomotive was built over a number of years sharing Ed's workshop with a model steamboat being built at the same time. 2195 has been faithfully built from original drawings and is complete to the minutest detail. One interesting item is the type of suspension used on the tender trucks, which have 3-point suspension as used on horse buggies in the 1880s. The only known existing tender in Canada with this type of suspension is that of 4-4-0 locomotive number 40 at the National Museum of Science and Technology in Ottawa.

Ed is now working on another 1 1/2 inch to the foot model, a CN pacific. The Association is very grateful to Ed Farley for donating this fine exhibit to the model collection of the Canadian Railway Museum.

Statistics of the locomotive follow:

STEAM LOCOMOTIVE 2195

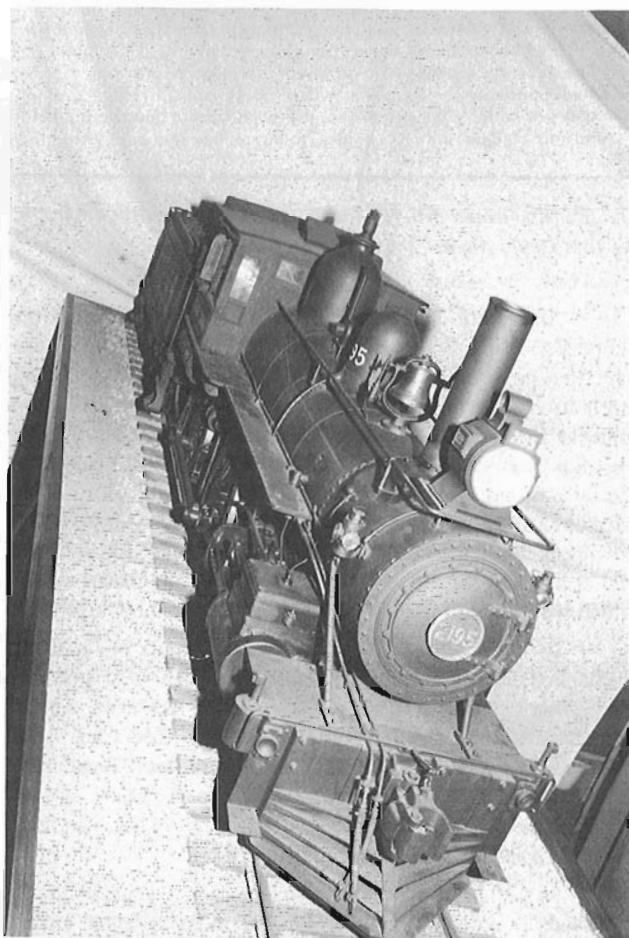
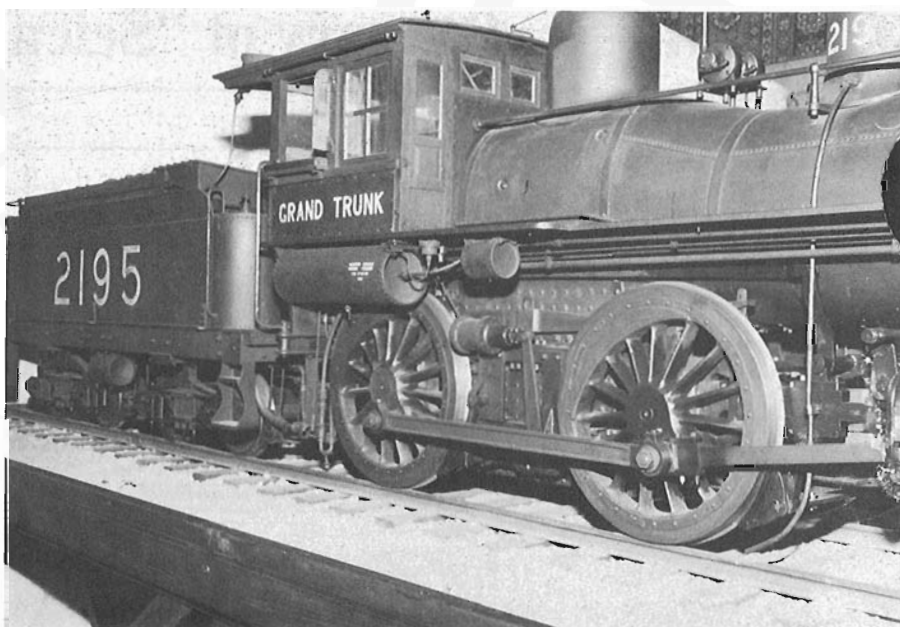
This is a model of a steam locomotive built in 1888 by the Canadian Locomotive Company in Kingston, Ontario, and is a classic example of how most of the smaller and older Grand Trunk Railway motive power looked when it was taken over by the Canadian National Railways in 1923.

2195 was re-numbered 132, class A-12-a, by CN, and was retired from service and scrapped in 1925.

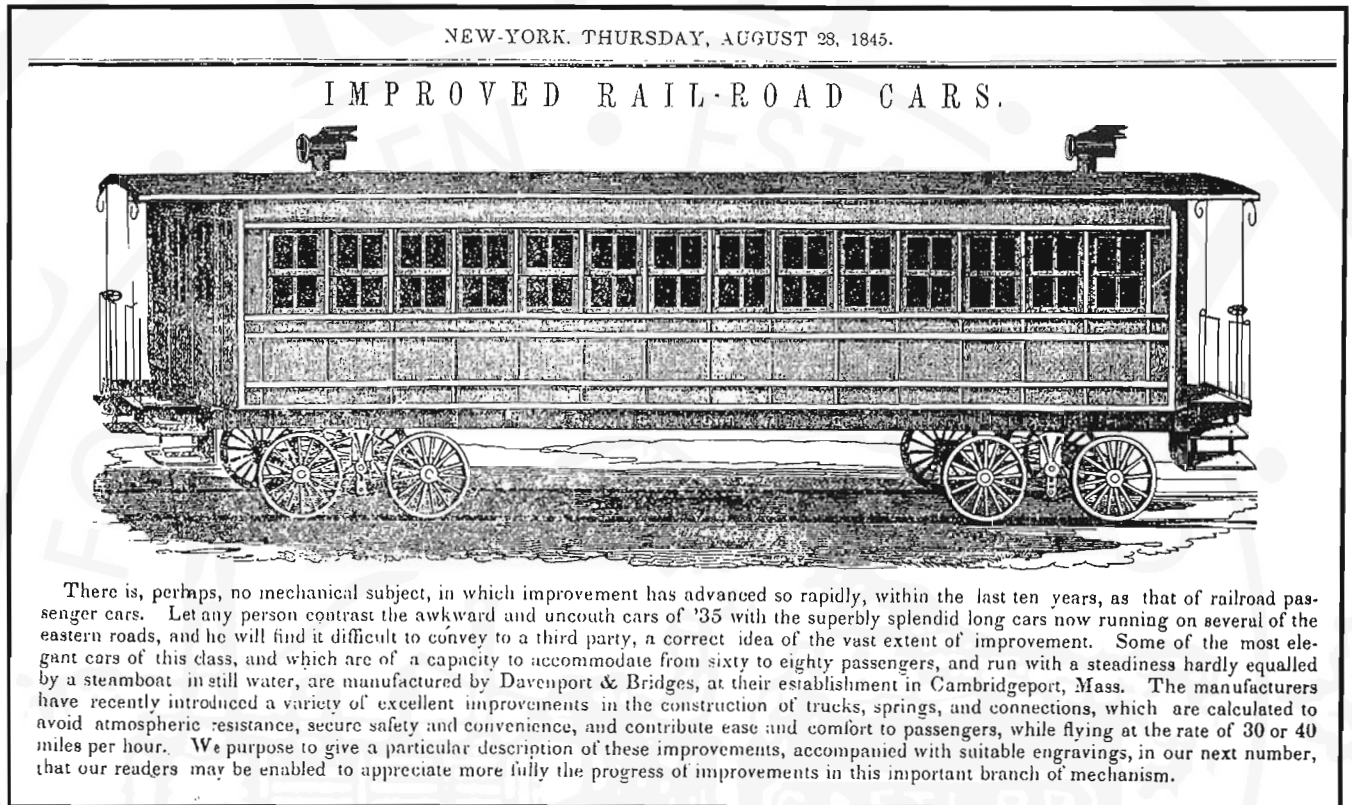
STATISTICS:

Type: American Standard (4-4-0).
Cylinders: 17 by 24 inches.
Drivers: 63 inches.
Boiler Pressure: 150 lbs. per square inch.
Tractive Effort: 14,000 lbs.

The model was built, by Ed Farley, to a scale of one and a half inches to a foot (one eighth of actual size), and was completed in November, 1989.



The 150th Anniversary of "Scientific American"



The first illustrated article ever to appear in Scientific American was about "Improved Rail-Road Cars". It appeared on the front page of the first issue, August 28, 1845.

August 28, 1995 marked the 150th anniversary of the publication of the first issue of Scientific American, a magazine which has provided the latest information of scientific progress for a century and a half. Many of the developments of the science of railways first appeared in the pages of Scientific American, and over the years it has described inventions of immense benefit to the railway industry. Along with these milestones of invention, have appeared many of questionable utility, and others that were downright farfetched, but all were the product of sincere inventors, and at the time no one could be sure which would succeed and which would fall by the wayside (or, perhaps, the trackside).

In 1845 the "railway mania" was sweeping England and the United States, and it is no coincidence that the very first illustration in the very first issue of Scientific American, August 28, 1845, was a design for "Improved Rail-Road Cars". The tradition continues, for the 150th anniversary issue, September, 1995, contains an extremely interesting 6-page article entitled "High-Speed Rail: Another Golden Age?". This article is recommended to all members.

In the intervening century and a half have appeared many thousands of railway articles. Many of these appeared before 1900, and a very few of these, covering the period from 1845 to 1899 are listed here:

- "A Smoke Filter for Locomotives" (Aug 28 1845).
- "Coal in Locomotive Engines" (Mar 9 1850).
- "American Railroad Iron" (Feb 8 1851).
- "Railroads in Europe" (Nov 1 1851).
- "American and European Railroads" (May 8 1858).
- "Engine with Walbridge's Cut-Off [invented by the Grandfather of Steve Walbridge] (Mar 15 1862).
- "The Proposed Arcade and Avenue under Broadway" [a proposal for a subway] (Feb 9 1867).
- "Winter Railroad Building in Minnesota" (Jan 23 1869).
- "The Pneumatic Tunnel Under Broadway" [New York's first, but short lived, subway] (Mar 5 1870).
- "Railway Tunnel Under the British Channel" [forerunner of the "Chunnel"] (Feb 17 1872).
- "Iron and Steel in Railway Car Construction" (Aug 11 1877).
- "The New York Elevated Railway" (Jan 12 1878).
- "Mr. Eads' Ship Railway for the American Isthmus" [Panama] (Nov 13 1880).
- "An Industrial City, Pullman Ill." (May 3 1884).
- "The Van Depole Electric Railway" (Jan 2 1886).
- "Railways in China" (Apr 17 1886).
- "Electric Street Cars in Philadelphia" (Jun 12 1886).
- "The Hamburg Electric Tramway" (Oct 2 1886).

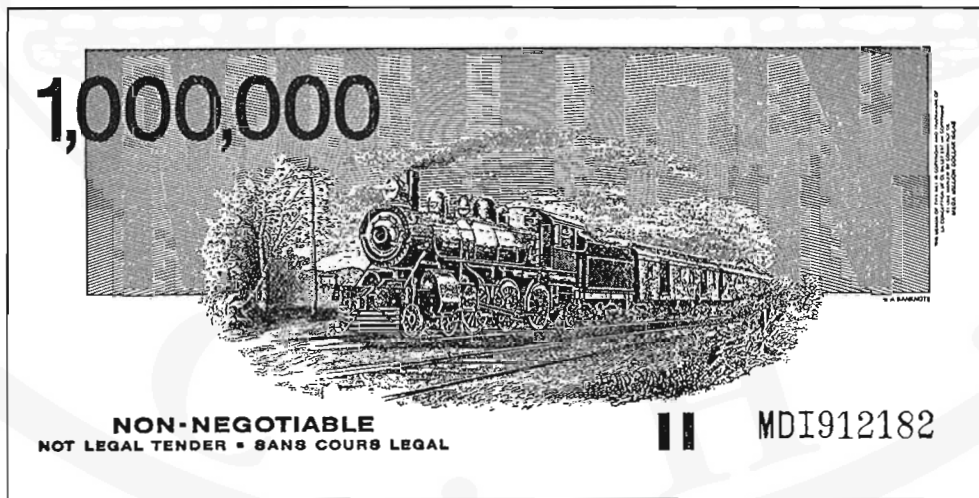
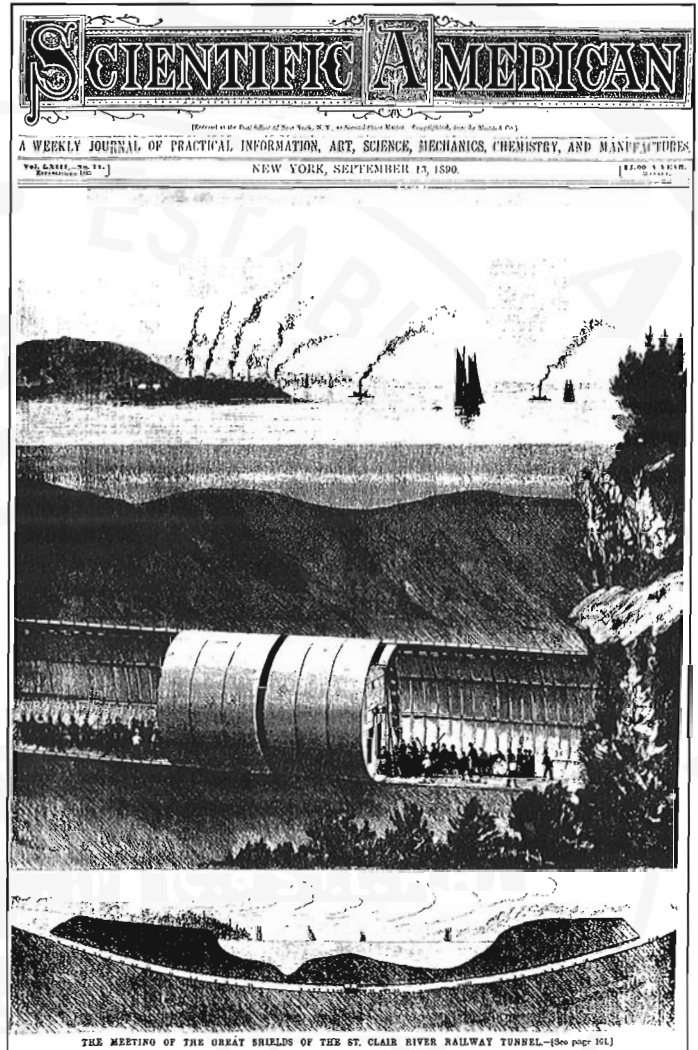
- “The Meeting of the Great Shields of the St. Clair River Railway Tunnel” [reproduced at right] (Sep 13 1890).
- “The Gorge Road at Niagara Falls” [the “Great Gorge” electric line] (Mar 28 1896).
- “Railroads and Bridges” (Jul 25 1896).
- “The American Locomotive” (Jul 25 1896).
- “Ancient Locomotive Engines” [Puffing Billy, Invicta and Locomotion] (Mar 18 1899).
- “Opening of the White Pass and Yukon Railway” (Apr 15 1899).
- “The Trans Siberian Railroad” (Aug 26 1899).

Some of these proposals were far ahead of their time, like the New York subway in 1867 or the Channel Tunnel in 1872, and others, like the ship railway across Panama, never made it at all. However many others did succeed and became features of the railways that we take for granted today.

We sincerely hope that Scientific American will prosper for its next 150 years, and that in the summer of 2145 its 300th anniversary issue will be reporting the latest developments of a still-vital railway industry.

Another Train On A Bank Note

In our July-August 1994 issue we reported that the last Canadian bank note to bear a railway subject was the \$10 note of the 1937 issue which was discontinued in September, 1954. Recently, however, a new “million dollar bill” has appeared showing a beautiful engraving of a 4-6-2 steam locomotive and train. A reproduction of this bill appears below. We hasten to say, however, that this note is non-negotiable, and is, in fact, what is referred to as a “fantasy note”. It is all in fun, and may even make one feel a bit richer! The engraving is excellent, and the note is well worth having, even though it can never be cashed.



BACK COVER: On the way to Sherbrooke with a CRHA excursion on October 13 1962, CNR No. 5107 displays a fine plume of smoke as it performs a runpast for waiting railfans. 5107, built in 1919, was one of the first locomotives built new for Canadian National. It is now preserved at Kapuskasing, Ontario.

Photo by Peter Murphy.

Canadian Rail

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