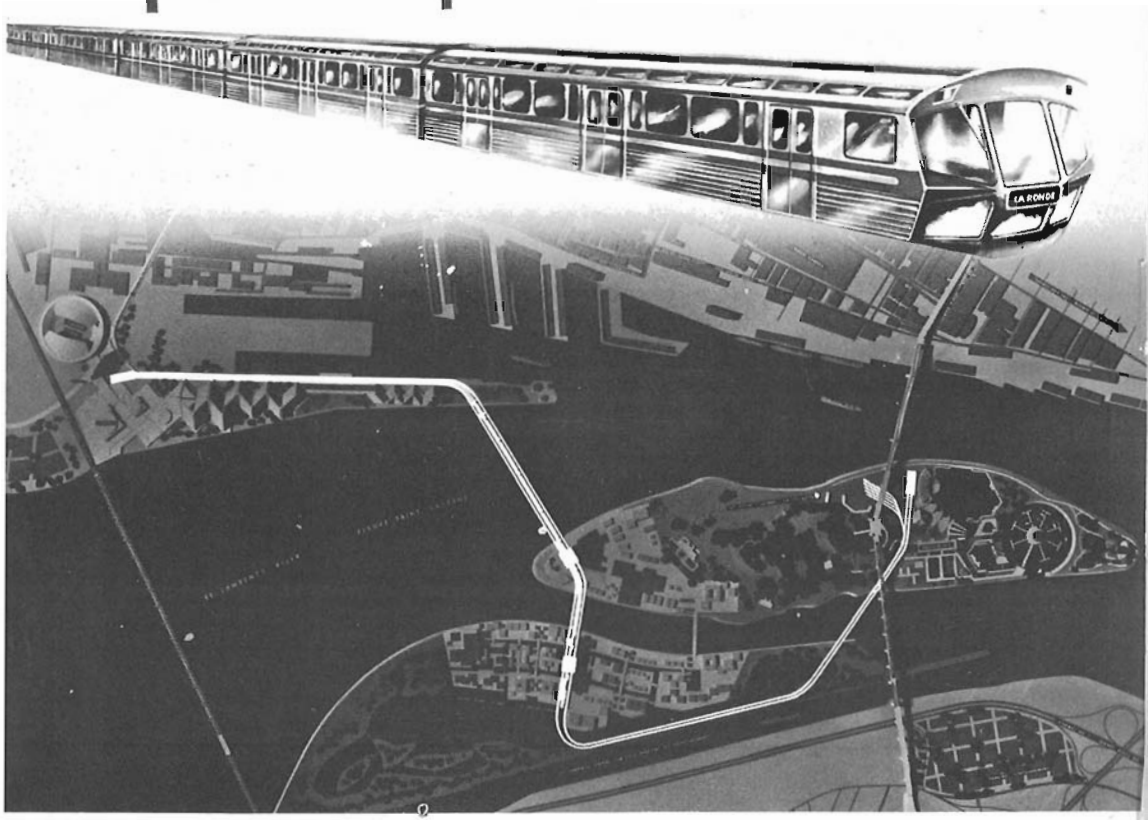
Canadian Rail

Number 159 / October 1964

THE LARGEST "SELKIRK" OF ALL, Canadian Pacific's T-4-a class locomotive 8000, dwarfs a "Baby Austin" sedan drawn up alongside the then-new mechanical marvel in Montreal's Windsor Station in May, 1931. Far from being a technical failure, 8000's withdrawal in 1936 and scrapping in 1940, just short of its tenth birthday, were brought about by the combined economic effects of a depression followed by a war.

expo-express



(Illustration courtesy Expo-67 Corporation)

(*)Werner Siemens. A celebrated German electrician. At the Berlin exhibition in 1879, he unveiled the first remotely-practical electric locomotive. Two years later, he inaugurated a one and a half mile line as a commercial enterprise in Lichterfelde, near Berlin.

(/)Frank Julian Sprague. Engineer - inventor, U. S. A. Frank Sprague fathered the first practical city-wide electric street railway system, and also developed the control mechanism that makes possible modern subways, electric railways and high-speed elevators:- Multiple unit control.

(-)Messrs. Ross and MacDonald. Officers of the Montreal Street Railway who perfected and established the Pay-as-you-Enter method of fare collection for transit vehicles -- one passenger = one fare, paid at the time of entrance, -- in place of the previous system of fare collection by a conductor who travelled around the moving vehicle.

Werner Siemens (*), Frank Sprague (/) and Canada's own Messrs. Ross and MacDonald (-) must have smiled in their respective graves last August 28th as Expo 67's General Manager Andrew G. Kniewasser made the announcement regarding the Exposition's choice for an internal transit system.

For the choice was an electric railway (*) operated with six-car multiple unit (/) sets and not charging one cent for the ride (-). The electrified rail system will be a far cry from that first electric rail line inaugurated by Siemens in 1879, and a vast improvement over Sprague's original Multiple Unit control system. Going even one better than Ross and MacDonald's Pay-as-you-Enter system, the Expo-Express will not charge its passengers anything. The price of entrance to the Exposition grounds will entitle patrons to ride on the line as far as they desire and as many times as it suits their fancy.

The Expo Express, designed to meet the requirements for a main mass transit system on the exhibition grounds, will be capable of transporting some 30,000 passengers per hour in each direction. Running time for a one-way trip, including four station stops, will be ten minutes. Average speed of the trains is set at 23 miles per hour. The three and one-quarter mile, double-tracked expressway, along which the trains will operate, will be raised over the pavillion areas. It will also accommodate service vehicles and pedestrian walks, and will have no level crossings.

There will be five transit stations on the line:

(1) Expo Rendez-Vous, at the main entrance gate on Mackay Pier.
(2) Place des Peuples, on the upstream extension of St. Helen's Island.
(3) The Exhibition Area in the middle of Ile Notre Dame.
(4) At the downstream park area of Ile Notre Dame.
(5) At the downstream extension of St.Helen's Island, which will house the LaRonde amusement park area and the marina. Stations in the exhibition areas will be above the ground and will include escalators. The raised roadbed will appear as a continuous platform, and will descend to ground level at the extremities of the line and along the Seaway wall of Ile Notre Dame.

Rolling stock will comprise eight six-car trains. During periods of peak travel, seven trains will be operated with a two minute headway. The eighth Expo Express will be on stand-by. Each car will have a seating capacity of 100 persons, with standing space available for an additional one hundred passengers. Cars will be fully air-conditioned and equipped with large windows which will permit riders exceptionally good views of the city, the Montreal Harbour and the Exposition grounds. Sound mufflers and other noise-reducing devices, such as welded steel rails, rubber track fastenings, and laminated wheels will ensure an exceptionally quiet and efficient operation.

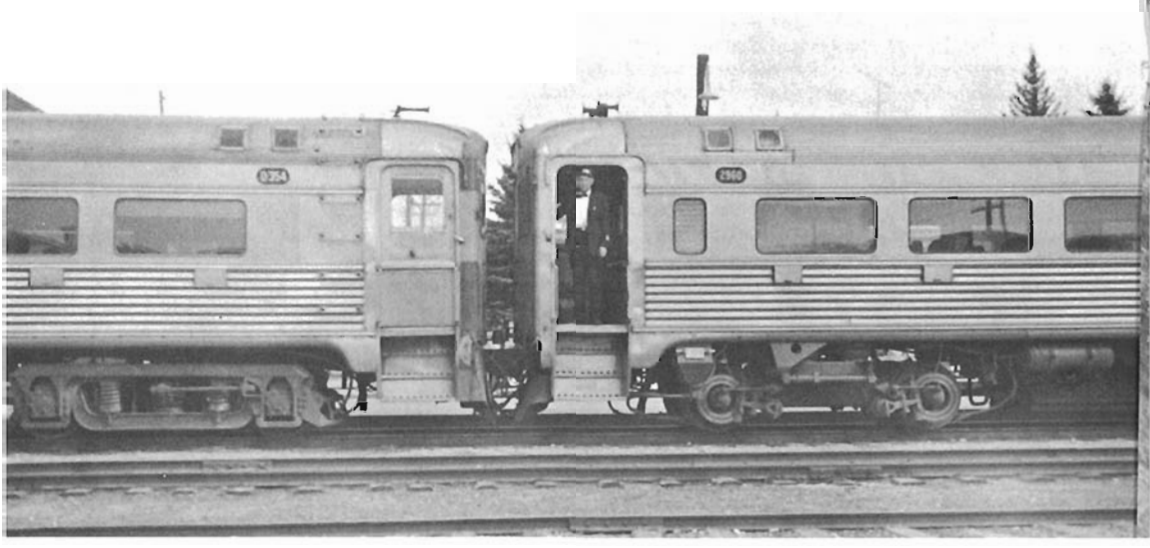
Hawker-Siddeley Canada Limited has been awarded the $12,083,000 contract to build the system. Acceptance of the Hawker-Siddeley tender, the lowest of several bids resulting from a world-wide call for proposals, will

directly affect a sizeable labour force all across Canada, involving production in three Nova Scotia cities and three Ontario communities, as well as in Vancouver, B.C., and Montreal, Que.

Construction of the road-bed is to begin in April 1965. Track laying is estimated to be completed by the end of that year. The manufacture of the rolling stock will begin in January 1966, and be completed by the following October. This schedule permits of ample trial runs before the opening of the Exposition on April 28th, 1967.

Unfortunately, Expo Express will be removed completely immediately after the 1967 Exposition closes, as agreed between the Expo 67 Corporation and the City of Montreal, in order to exclude any possibility of competition with the new rubber-tyred Metro line, which is being constructed between Montreal, St. Helen's Island, and the South Shore. It has been impossible to ascertain whether the Expo-Express will be standard gauge, Toronto gauge, or something else again. Expo officials are most reticent to discuss this point. However, Expo Express could, with little modification, be used on other Canadian transit systems. Perhaps Montrealers might be able to enjoy riding the relocated "Expo-Express" equipment on the Mount Royal-Deux Montagnes rail line that the Canadian National Railways and the suburban municipalities are even now planning to convert to "rapid transit" status.

The much-travelled Budd R.D.C. demonstrator -- #2960 -- which has been leased by the Canadian National Railways, has been assigned to service out of Saskatoon, Saskatchewan. During September, the unit was operating on trains 631 and 632 between Saskatoon and Hudson Bay, along with C.N. Railiners D-475, D-451 and D-354. The contrast between the air-suspension and outside disc brakes of No. 2960 and the more conventional RDC trucks under D-354 is shown by the photograph below, taken at Melfort, Sask. on Sept. 25th.



GREEN LIGHT FOR THE "RAPIDE"

A consulting engineering panel consisting of Shawinigan Engineering Co. Limited, and DeLeuw, Cather and Associates, submitted a lengthy and detailed report, on October 22nd, to the Mount Royal Tunnel Rapid Transit Study Committee, which is composed of representatives of fourteen of the northwesterly suburbs of the city of Montreal, as well as the City itself. The report confirmed previous opinion that the plan to convert most of the Canadian National Railways' Montreal Terminal suburban electrification into a high-capacity rapid transit system is both technically and financially feasible.

The price placed on the project would be about $2 million per mile, fully equipped, or a total of $40,441,000 for additions and improvements to the existing line, including rapid transit rolling stock. While indications are that if the report is adopted, construction would be started immediately with a view to have it in operation by 1966, the study contemplates that 48 used units of rolling stock would be available from the temporary first-line rapid transit system which is to be built for the 1967 Universal Exposition, for $1,152,000. These cars would be released to the Mount Royal Tunnel line at the close of the Expo, in the autumn of 1967. Other grants and aid for which the system would be eligible, would contribute about $5,000,000. Economics developed in the study indicate that passengers would approximate 53,729,000 per annum, with a total car mileage of 14,114,000. Revenues of $13,780,000 annually would be offset by expenditures totalling $11,875,000, leaving an annual surplus of $1,880,000. For an additional $5,000,000, a 1.2 mile spur could be built to connect Chomedey with the existing line, presumably near Ste. Dorothee.

The report proposes the formation of a public body to be known as the Mount Royal Rapid Transit Commission, composed of the participating towns which are: Chomedey, Deux Montagnes, Dollard, Iles Laval, Laval Ouest, Laval-sur-le-Lac, Mount Royal, Montreal, Outremont, Pierrefonds, Roxboro, Ste. Dorothee, St. Eustache, St. Laurent and Ste. Marthe-sur-le-Lac. The Commission would be composed of five members, and it is proposed that the system be called the "Rapide", evidently to distinguish it from the City of Montreal's own internal "Metro" system now under construction and slated for opening in 1966.

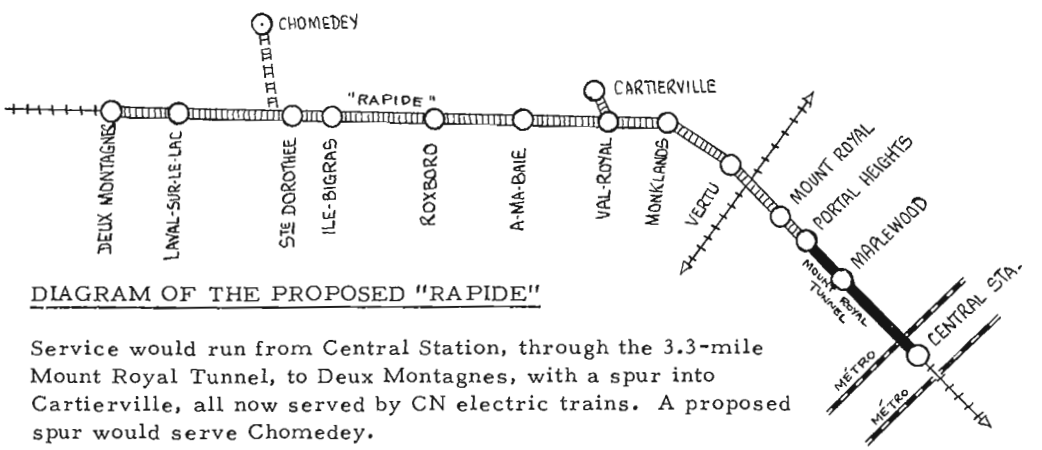
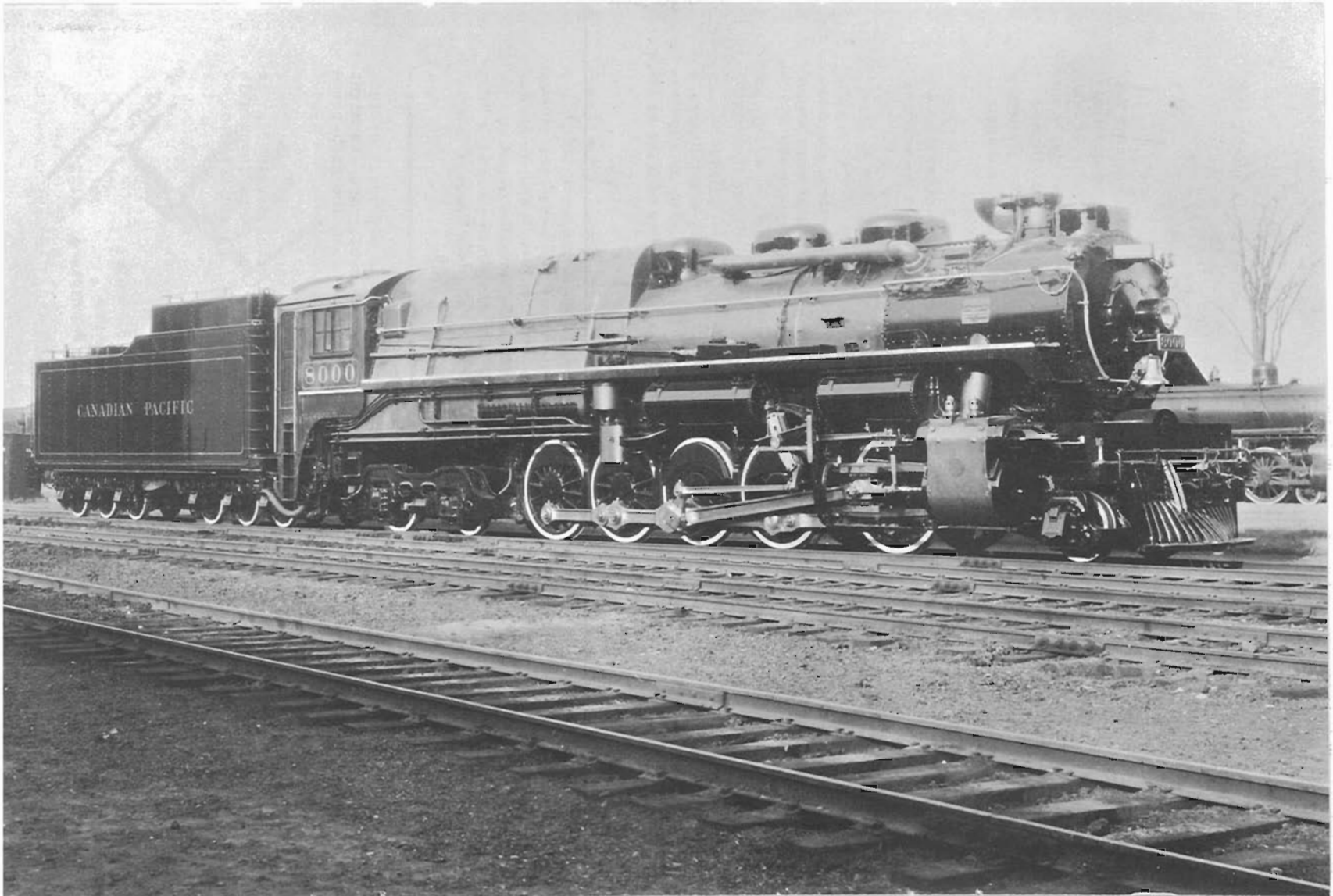


DIAGRAM OF THE PROPOSED "RAPIDE"

Service would run from Central Station, through the 3.3-mile Mount Royal Tunnel, to Deux Montagnes, with a spur into Cartierville, all now served by CN electric trains. A proposed spur would serve Chomedey.


CANADIAN PACIFIC
8000

Canadian Pacific 8000

-- O.S.A.Lavallée

In May 1963, when Canadian Pacific unveiled its "Show of Power" at Windsor Station in Montreal, unquestionably the largest and most impressive part of this exhibit was CP's 2-10-4 No. 5935, the last of its famous "Selkirk" type freight and passenger steam locomotives, and the last steam locomotive to be built for the Company. Indeed, No. 5935 was the last standard-gauge steam locomotive built for any railway in Canada.

Whenever I came upon No. 5935 during the five-day display, my recollections took me back to another day almost thirty-two years before in the same station when, as a small boy, I was taken by my father to see a giant among giants. This was the not-so-well-known thirty-seventh "Selkirk" (the type name had not even been applied to them, then), class T-4-a No. 8000, Canadian Pacific's multi-pressure locomotive, which was born, economically speaking, at a very inopportune time. It managed, however, to produce some remarkable results in a short operating career of less than six years, a period which coincided with the great economic depression of the Nineteen-Thirties.

The construction of this locomotive came about as a result of several factors. One was the considerable interest evinced in multi pressure locomotives at this time, for reasons which will be dealt with later. Another was the fact that, in 1929, Canadian Pacific had introduced twenty locomotives of the 2-10-4 wheel arrangement for use on its main line in the Rocky Mountains; this type had never before been used in Canada. Further, Canadian Pacific had always been interested in experimental work on steam locomotives and was in the forefront in this field in Canada.

The conditions which gave rise to the multi-pressure steam locomotive was simply that basically, the railway locomotive boiler had not changed in the course of more than a century of application. Such development as there had been was characterized by a growth in size, an improvement in materials and in the development of ancillaries such as the superheater and the feedwater heater. Working pressures had risen from between 80 and 120 pounds obtaining in the 1860s, to about 150 pounds in the late Nineteenth Century. In the first quarter of the Twentieth Century, pressures doubled to about 300 pounds. Railway locomotive designers generally recognized that, with materials and methods as they existed at that time, 300 pounds was about the maximum effective pressure for a stayed locomotive boiler. Hence, developers cast about for new ways of achieving greater locomotive thermal efficiency by discarding traditional forms of steam generation and designing radically new apparatus which would allow substantially higher pressures to be used, realizing greater efficiency and operating economy, particularly in fuel.

No. 8000 was a product of this school of thought, and we might have heard more from the high-pressure steam locomotive, had it not been for the onslaught of the Depression at the time when these machines were being developed. As things turned out, more favourable economic conditions did not come about until after the close of the second World War in 1945, by which time the diesel-electric locomotive was approaching the height of its popularity in North America. In fairness it should be said, however, that even the strongest protagonists of the high- or multi-pressure machines would never admit that they could long have withstood the

advent of the internal-combustion locomotive due to considerations other than fuel-consuming efficiency, such as the high cost of labour and the need for expensive general repairs and overhauls based on statutory requirements, to use but two examples.

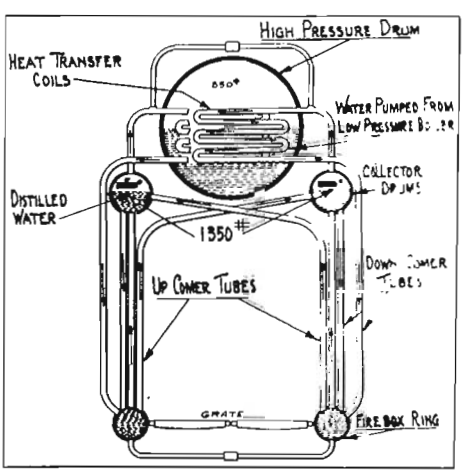
Introduction of the T-1-a 2-10-4s in 1929 had the effect of setting up entirely new standards of performance on the always-troublesome CPR main line in the Rocky Mountains. Canadian Pacific had set its own pace when it decided, early in the following year, to construct a locomotive similar in wheel arrangement, weight and other characteristics, but embodying the multi-pressure principle, in order to make direct comparisons with the original units of traditional type.

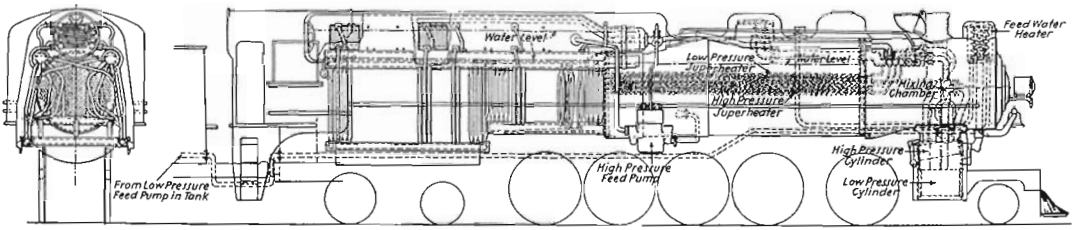
Construction of what was to become the heaviest locomotive in the British Empire was begun at Angus Shops in November 1930, under the supervision of Canadian Pacific's active and imaginative Chief of Motive Power & Rolling Stock, Mr. H. B. Bowen. The general arrangement of the locomotive was the product of CPR's own mechanical staff, but the boiler was the result of consultation and collaboration between the railway, the American Locomotive Company and the Elesco Feedwater Heater organization, who jointly developed plans for a unit embodying chambers in which three different pressures would be in use simultaneously:

(a) A conventional, low - pressure boiler, generating steam from injected water up to a pressure of 250 pounds per square inch, which steam was super-heated, mixed with exhausted highpressure steam, and utilized in the two exterior 24 x 30" cylinders in conventional position.

(b) A high-pressure boiler, generating steam from injected water up to a pressure of 850 pounds per square inch, which steam was utilized in 15½x28" cylinder mounted in between the two low-pressure cylinders. The exhaust from the high-pressure cylinder was then mixed with the low-pressure live, superheated steam and the mixture used in the low-pressure cylinders.

(c) A very high-pressure heat-exchange unit consisting of a number of tubes forming the walls and roof of the firebox, in a closed-circuit utilizing distilled water. Pressures obtained in this circuit ranged from about 1,350 to about 1,600 pounds per square inch, the heated water rising naturally upward in the tubes to the high pressure boiler, which was insulated from the firebox proper. The closed-circuit elements passed through the high-pressure boiler, with the distilled water losing much of its latent heat at this stage. Safety valves on the heat-exchange unit were set at 1700 lbs. per sq.inch, and it was thus unlikely that any loss of steam (and thereby, distilled water) would take place on a normal journey. Utilization of distilled water eliminated troublesome scale formation in the close circuit.





Steam and water flow in boiler of Multi-pressure Locomotive 8000, Canadian Pacific Railway.

The safety features of No. 8000 were stressed. The locomotive did not have a crown sheet, since the only location at which flame came in contact with metal parts for heat generating purposes, was in the tubes of the heat-exchan g e unit. The closed circuit was insurance against a low water condition but in any event, failure of one of the exchanger tubes would not result in damage to the boiler of anywhere near the magnitude of a crown-sheet or arch-tube failure on a conventional locomotive.

Heating of the low-pressure boiler was dependent entirely upon gases flowing from the firebox to the smokebox. The rear flue-sheet was riveted to the inside of the boiler shell, instead of to the firebox, and was some distance ahead of the firebox proper. The low-pressure boiler incorporated superheating tubes for both high- and low-pressure steam, one set of tubes on one side and one on the other, of similar dimensions.

The flow of water and steam was thus: Water from the tender was injected into the low-pressure boiler, where it was raised to pressure by means of the gases flowing from the firebox to the smokebox. The steam was drawn off through the low-pressure superheater and utilized in the low-pressure cylinders and then exhausted to the atmosphere through the smokestack. In addition, hot water was drawn from the low-pressure boiler to feed the high pressure boiler, where it was raised to pressure through the closed-circuit heat-exchange unit in this boiler. This steam was then passed through the high-pressure super-heater, and then to the high-pressure cylinder where, upon exhausting, it was mixed with the low-pressure live steam and then utilized in the low pressure cylinders. A multiple throttle governed the admission of steam into the cylinders for both systems, and was so arranged that there was only one throttle lever in the cab.

Some of the other characteristics of No. 8000 were interesting, as well. A special framing had to be constructed to afford the same rigidity with the exchanger tubes in the firebox area, that a conventional firebox would provide. The low-pressure cylinders were fitted with Walschaert valve gear, the high-pressure cylinder motion being derived from this gear by means of Gresley valve motion, the cutoff being equal in all three cylinders. At 85% of boiler pressure, the tractive effort was estimated to be 83,300 pounds.

In order to maintain torque uniformity, the cranks on the high- and low-pressure cylinders were set at approximately 120 degrees. This resulted in an uneven exhaust when the locomotive was starting up or running at low speeds. Nickel-steel was extensively used in its construction, particularly in the low-pressure boiler, where economies in weight were achieved. The locomotive controls were made to correspond as closely as possible with those of a conventional locomotive, so that, in theory at least it could be turned out into the regular motive power pool for operation by any engineman called for duty with it.

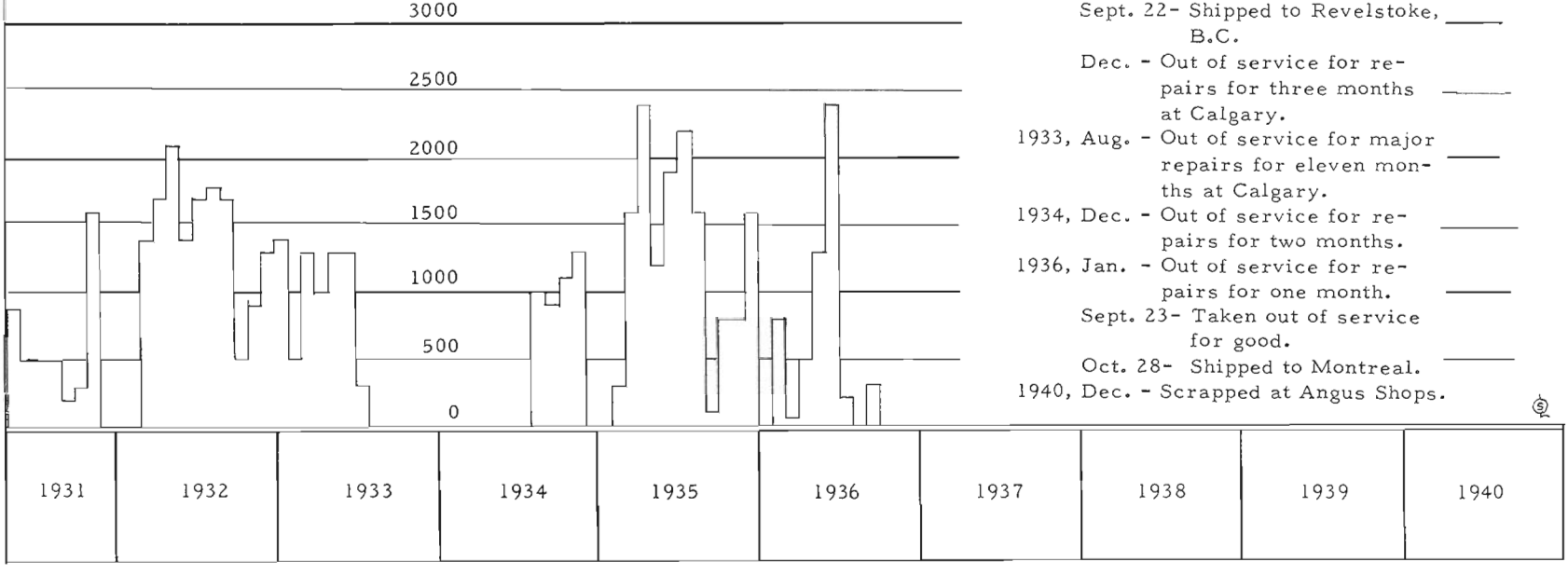
Work on the locomotive at Angus Shops proceeded through the

The Canadian Pacific Railway.

MULTI-PRESSURE LOCOMOTIVE

No. 8000

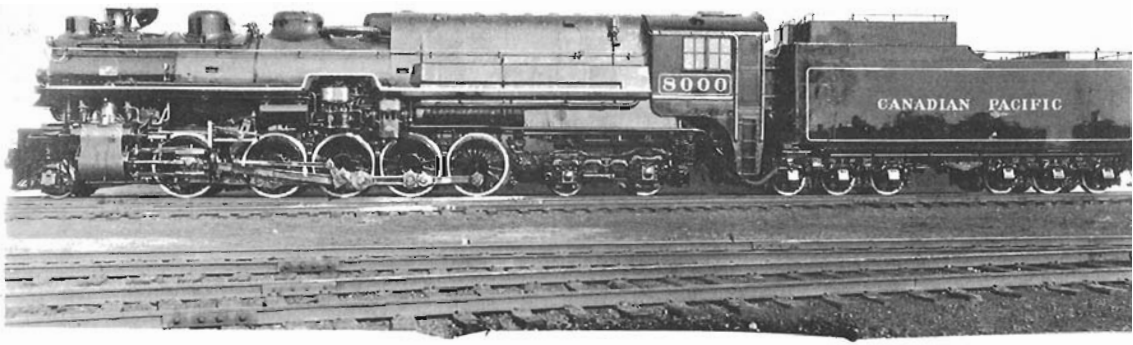
Chart showing mileage in service, by month,
May, 1931 - December, 1940



Total mileage performed in service,
May 1931 - Dec. 1940: 50,410 miles.

CHRONOLOGY

1931, May 29 - Locomotive placed in service at Montreal.
Sept. 22- Shipped to Revelstoke, B.C.
Dec. - Out of service for repairs for three months at Calgary.
1933, Aug. - Out of service for major repairs for eleven months at Calgary.
1934, Dec. - Out of service for repairs for two months.
1936, Jan. - Out of service for repairs for one month.
Sept. 23- Taken out of service for good.
Oct. 28- Shipped to Montreal.
1940, Dec. - Scrapped at Angus Shops.



winter of 1930-31 and in April the high-pressure and heat-exchanger units, which had been built separately, were transferred to the locomotive frame and low-pressure boiler. About six weeks were required to complete assembly of No. 8000, and it was released for road trials on May 29, 1931, having cost all but $300,000.00.

It was decided to retain it in the east for trials on the Winchester Subdivision, between Montreal and Smiths Falls, before shipping it to the Rocky Mountains. During June, July, August and the first part of September, it travelled 2,598 miles, while minor adjustments were made in the light of operating experience, such as the size and location of its fuel oil burners. In spite of these factors, under conditions of high speed and heavy tonnage, No. 8000 showed savings of up to 25% in fuel consumption, on the comparatively-level Smiths Falls run.

On September 22nd, 1931, No. 8000 was shipped west to Revelstoke B.C. in knocked-down condition. Reassembled upon arrival, it was in freight service for over two months clocking an additional 2,000 miles, before being sent to Ogden Shops for further repairs and adjustments. Released in March, 1932, No. 8000 remained in service (but for a #3 repair at Revelstoke in October 1932) until July, 1933. During this period, the locomotive averaged 1275 miles per month. No. 8000 remained out of service for thirteen months, until August, 1934 during which time repairs were carried out to the closed circuit, evidently as and when men were available to work on it.

Returned to service, No. 8000 was in service for twenty-two out of the next twenty-six months, averaging 929 miles per month. It was in shop periodically for #3 repairs, mainly to superheater elements, to the closed circuit and, at one time, for renewal of the high-pressure piston head. In spite of this, fuel economies of just short of 15% were realized at slow speeds on the 2.2% grades between Revelstoke and Field, B.C. The Company admitted, however, that the mechanical complexity of the unit, and the unfamiliarity of shop staff who had to work on it even for routine tasks, made for higher maintenance costs at a time when Canadian Pacific was striving to cut costs so as to retain its enviable record of remaining "in the black" through the most adverse economic periods. So, on September 23rd, 1936, No. 8000 was blown down for the last time, and on October 28th, 1936, was shipped back to Angus Shops, where it arrived on November 21st of the same year. Obviously, the intention was to retain it until money was again available to experiment with it.

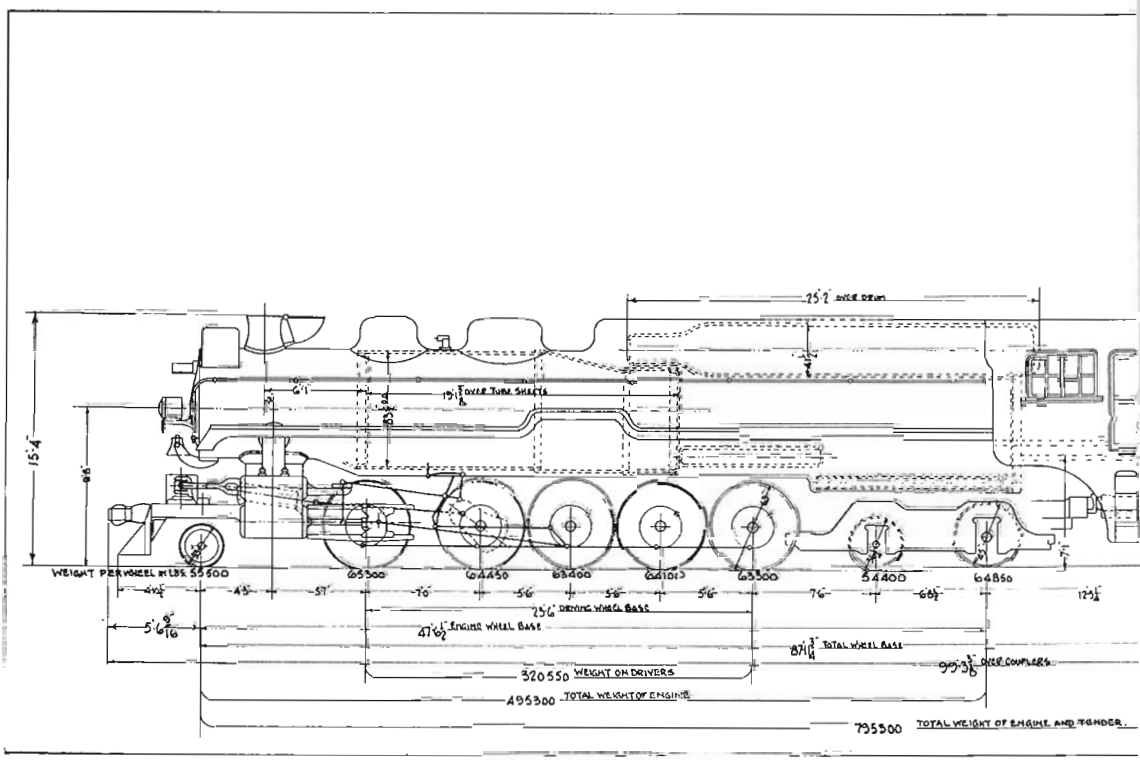
It remained at Angus for four years, an incongruous sight in the lines of tiny, older locomotives, held there for scrapping. Periodically, it was cannibalized for parts, many of which were standard with T-1 class engines of the 5900-5919 series.

The outbreak of war and the shortage of scrap finally resulted in the decision to dismantle the "biggest of them all". No. 8000 was cut up in December, 1940, bringing to a close a career of just under ten years, which might

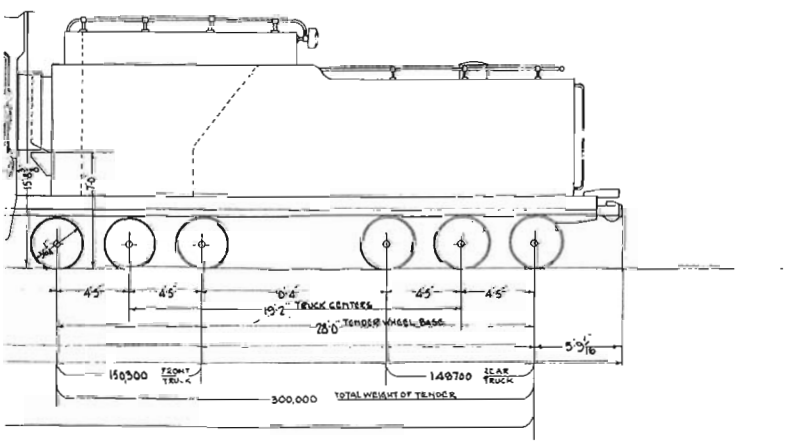
CANADIAN PACIFIC RAILWAY

T-4 class

Superheating surfaces -		
	H.P. Boiler	941 sq. ft.
	L.P. Boiler	1102 sq. ft.
Grate area		77 sq. ft.
Factor of adhesion		3.83
Weights:	On drivers	320,550 lbs.
	On engine truck	55,500 lbs.
	On front trailer	54,400 lbs.
	On back trailer	64,850 lbs.
	Engine - total	495,300 lbs.
	Tender (loaded)	302,120 lbs.
Oil capacity		4350 Imp.gals (5220 US gals)
Water capacity		12,000 Imperial gallons.
Oil capacity, running order 4" below top of tank:		4100 Imp.gals(4920 US gals)
Tractive effort:		90,000



Boiler Pressures:	Closed system	1350#
	H.P. Boiler	850#
	L.P. Boiler	250#
Cylinders:	1 H.P. Cylinder	15½x28"
	2 L.P. Cylinders	24 x30"
Diameter of Driving wheels		63"
Firebox :	Length inside	129 3/8"
	Width inside	85 3/4"
Flues:	214 - 3½" diam.	
Length over flue sheets	19' - 1 3/8"	
Heating surface -	Closed system firebox tubes	520 sq. ft.
Evaporating surfaces -	H.P.Boiler	
	Transfer coils	750 sq. ft.
	L.P.Boiler flues	3730 sq.ft.
	L.P.Boiler flue sheet	16 sq. ft.

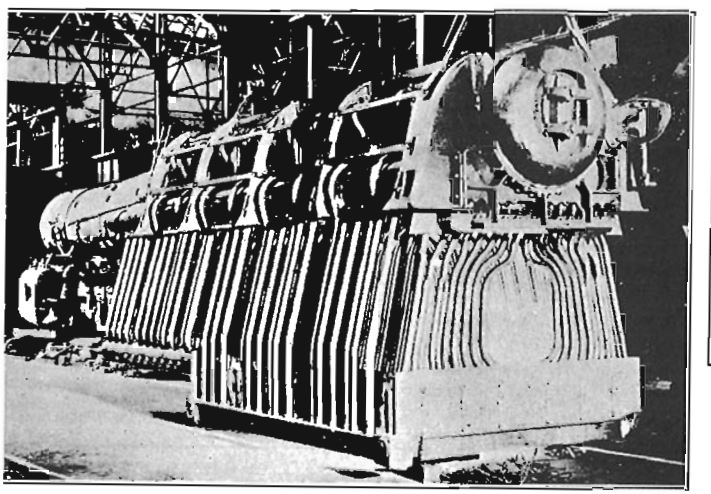


T4 CLASS	
Closed System 1350#	Boiler Pressures.
H.P. Boiler 850#	
L.P. Boiler 250#	
1 H.P. Cyl. 15½ x 28	Cylinders
2 L.P. - 24 x 30	
63	Dia. of Driving Wheels
129 3/8	Firebox Length Inside
85 1/4	" Width "
214 3½ Dia	Flues.
19'-1⅜	Length over Flue Sheets.
520 Sq.Ft	Heating Surface Closed System Firebox Tubes
750 " "	H.P. Boiler Transfer Coils (Evaporating Surfaces)
3730 " "	L.P. " Flues
16 " "	L.P. " Flue Sheet
941 " "	H.P. " (Superheating Surfaces)
1102 " "	L.P. "
77 Sq.Ft	Grate Area.
5.83	Factor of Adhesion.
370,550	Weight on Drivers.
52,500	" " Engine Truck
54,400	" " Front Trailer
64850	" " Back "
493,300	Total Weight of Engine
302,120	Weight of Tender Loaded
4100 IMP 4920 U.S.	Oil Capacity Gallons.
12000	Water Capacity Imp. Gallons.
4100 IMP.	Oil Capacity Gals. Running.
4920 U.S.	Order 4" below top of Tank
300000	Weight of Tender Running Order
90000	Tractive Effort.

CANADIAN PACIFIC RAILWAY
MECHANICAL DEPARTMENT.
PRELIMINARY
2-10-4 TYPE LOCOMOTIVE
C-54-L-53 MAR.1431

have taken a different turn at another period in the national economy.

It is interesting that the determining factor, in spite of impressive fuel savings, turned out to be maintenance cost, and that this was the same basis on which compounding of steam locomotives, so popular at the turn of the century, foundered. In spite of allegations to the contrary, no multi-pressure locomotive could have withstood the growth in popularity of the internal-combustion locomotive but this much can be said for Canadian Pacific: The Railway didn't just take someone else's word for it, it proved it for itself by running No. 8000 for six years and over 50,000 miles over some of the most gruelling main line railway in North America.



Firebox unit and high pressure drum of boiler, Multi-pressure Locomotive 8000, Canadian Pacific Railway. Low pressure portion of boiler shown in left background.

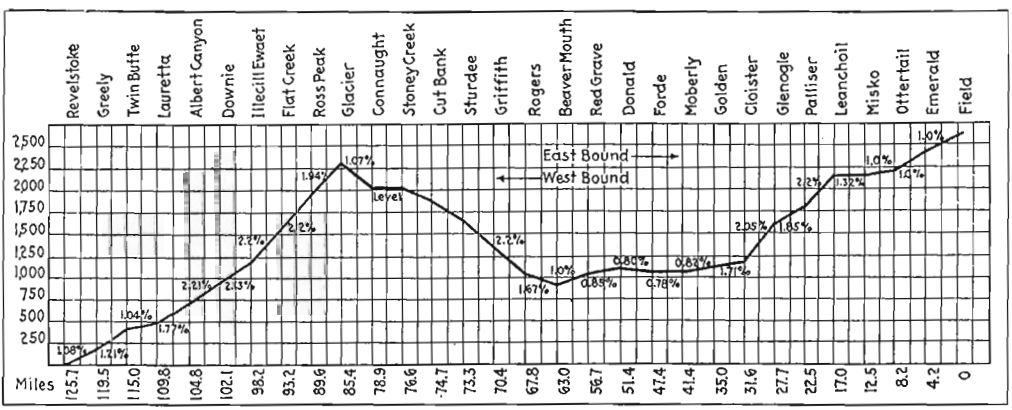
Illustrations courtesy Mr. O. S. A. Lavallee, the author, and Canadian Pacific Railway.

Performance Record T4 and T1 Class Locomotives

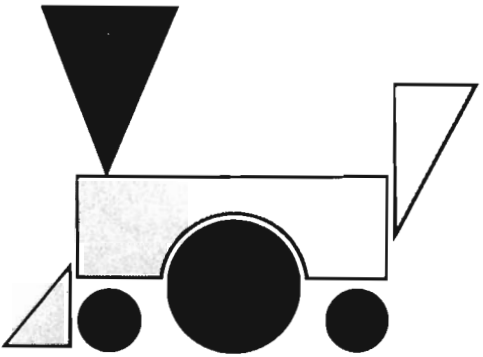
				T4-a-avg.	per cent Improvement T4-a over T1,	T1-a-avg.	T1-a 5907	T1-a 5905	T1-a 5905
Class	T4-a	T4-a	T4-a						
Locomotive No.	8000	8000	8000						
Beavermouth to Glacier (Westbound) 22.5 Miles									
Date	4-23-32	4-15-32	6-22-32	.....	.....	.....	4-26-32	4-28-32	.....
No. of cars, total	37	44	16	.....	.....	.....	20	17	.....
Weight of train, equiv. gross tons	1,029	1,060	1,103	1,064	.....	1,069.5	1,046	1,093	.....
Equiv. gross ton-miles	23,152	23,850	24,818	23,940	.....	24,063	23,535	24,592	.....
Lb. of oil, total	3,374.8	4,399.8	4,689.9	4,154.7	.....	4,878.4	5,144.4	4,612.5	.....
Lb. of oil used per 1,000 equiv. g.t.m.	146.0	184.8	188.9	173.2	14.9	203.5	218.8	188.2	.....
Lb. of oil used per locomotive mile	149.9	195.5	208.4	184.6	.....	216.8	228.6	205.0	.....
Lb. of water, total	47,850	47,130	49,150	48,040	.....	49,885	47,840	51,930	.....
Lb. of water used per lb. of oil	14.2	10.7	10.47	10.79	5.3	10.25	9.3	11.2	.....
Total time on road	1 hr.16 min.	1 hr. 45 min.	1 hr. 47 min.	1 hr. 36 min.	.....	1 hr. 24 min.	1 hr. 18 min.	1 hr. 31 min.	.....
No. of stops	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total time delayed	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ruling grade and curve	2.2 per cent, 10 deg.	2.2 per cent, 10 deg.	2.2 per cent, 10 deg.	.....	.....	.....	2.2 per cent, 10 deg.	2.2 per cent, 10 deg.	.....
Albert Canyon to Glacier (Eastbound) 19.4 Miles									
Date	4-30-32	6-15-32	6-23-32	.....	.....	.....	4-25-32	4-27-32	4-29-32
No. of cars, total	49	37	41	.....	.....	.....	44	45	44
Weight of train, equiv. gross tons	1,088	1,076	1,108	1,090.6	.....	1,053	1,058	1,051	1,052
Equiv. gross ton-miles	21,107	20,874	21,495	21,158.6	.....	20,441	20,525	20,389	20,408
Lb. of oil, total	4,583.5	4,960.7	4,951	4,831.7	.....	5,467	5,424.8	5,753.6	5,192.7
Lb. of oil used per 1,000 equiv. g.t.m.	217.1	237.6	230.3	228.3	14.7	267	264.6	283.4	254
Lb. of oil used per locomotive-mile	236.2	255.7	255.2	249	.....	281.2	279.5	296.5	267.6
Lb. of water, total	54,460	49,150	54,070	52,560	.....	54,040	50,570	53,270	58.270
Lb. of water used per lb. of oil	11.88	9.9	10.92	10.9	10.1	9.9	9.3	9.2	11.2
Total time on road	1 hr. 52 min.	1 hr. 19 min.	1 hr. 48 min.	1 hr. 40 min.	.....	1 hr.33 min.	1 hr. 23 min.	1 hr. 51 min.	1 hr. 26 min.
No. of stops	2	.....	1	1	.....	2	2	1	3
Total time delayed	29 min.	.....	20 min.	16 min.	.....	2 min.	2 min.	1 min.	2 min.
Ruling grade and curve	2.2 per cent, 10 deg.	2.2 per cent, 10 deg.	2.2 per cent, 10 deg.	.....	.....	.....	2.2 per cent, 10 deg.	2.2 per cent, 10 deg.	2.2 per cent, 10 deg.

The principal officers of Canada's operating and non-operating railway unions visited the Canadian Railway Museum on Wednesday afternoon, September 2nd. The photograph also shows L.B.&S.C. Ry. "WADDON", and the Canadian Pacific Dayliner, which transported the party from Montreal to the Museum.

Canadian Pacific No. 8000 -- continued



Profile of the Canadian Pacific line between Revelstoke and Field over which Locomotive No. 8000 is operating



MUSEUM PROGRESS REPORT

-- Fred Angus.

During the spring and summer, work at the museum has continued, and since the beginning of May, so many changes have taken place that one would scarcely recognize the site. First, Track 3, the last remaining unconnected bay in the building, was joined to the lead on May 2nd, and then work pushed forward on track "O" which is between the building and the south side of the property (see diagram in May, '64 Canadian Rail). While this work was being pushed ahead on weekends, a bulldozer was hired during the week to level the remaining parts of the land in preparation for the trackwork for the new building and the proposed turntable. The fence was relocated in places, and the hollow at the North West corner completely filled in.

The next big development came in June when the Army Engineers erected the new bridge over the St.Pierre river, replacing the smaller structure built in 1962. The old bridge had never really been used, as it was too small and had been damaged by ice in the Spring. With completion of the new structure (also named Gzowski Bridge), it became possible to carry the access road over the span, and so the temporary road was closed on July 2nd and the new road opened July 11th.

Meanwhile, Track "O" had been laid with 100 lb. rail eastward along the south fence, and was continued through a sharp right angle curve with 56 lb. rail around the back of the building to a point near the rail entrance gate. This provided storage space for street car work equipment which had formerly been on the lead tracks in front. During July, track "O" was extended westward to the southwest corner of the property. This work, which was completed August 8th, allowed three more steam locomotives to be brought from the CPR Shops, as well as accommodating the three CP engines, formerly stored near Delson Station. These units have been the only equipment brought to the museum since last winter, so it was possible to work on a clear track and do a more efficient job of tracklaying. There are now 62 pieces of equipment on the property, of which 40 are under cover.

With this progress it became possible to be host to the Vintage Automobile Club of Montreal on August 9th. Following this, the museum was opened to the public, on a limited basis, on Sunday afternoons.

Finally, on September 5th, work began on the line into the area for the new building. The project has passed an important milestone, and is now going into the second half of the basic layout.

During the next few months, it will probably be necessary to bring a considerable number of locomotives to the museum, both from the C.N.R. and the C.P.R. Hence it is very important that the members take advantage of the remaining weekends before the winter, to come to Delson and help with the tracklaying. Progress has been very good so far this year, and if there is more enthusiasm, the end of 1964 will see the project on, or even ahead of, schedule, so that in 1965 the museum can be opened on a regular basis.

Railways of the Eastern Townships of Quebec

ORFORD MOUNTAIN RAILWAY.

In 1870, the Missisquoi & Black Rivers Railway was incorporated to build from a point on the boundary of Potton Township and it is believed that it was to be a northern extension of the Missisquoi Valley Railway in Vermont; the two forming a line from St. Albans to Richmond. Progress was slow and it took nine years to complete the grading from Melbourne to Bolton and lay rails from Dillontown (now Eastman) to the Bolton copper mines. This exhausted the resources of the Company and it went bankrupt. The Central Vermont Railroad then operated the completed portion as an industrial spur until about 1887 when the mines closed.

The Orford Mountain Railway was incorporated in 1888; in 1892 it was completed from Eastman to Lawrenceville and a year later to Kingsbury most of it being built on the abandoned grade of the Missisquoi & Black Rivers Railway. In 1904, it was built south from Eastman to Potton and a branch to Stukely Lake and in 1905 an extension from Kingsbury to Windsor Mills. In 1907 it was built southward to Mansonville.

The Canadian Pacific Railway bought the property on March 1st, 1910 and extended the line from Mansonville to a connection with the Newport line at North Troy. The last mile of this extension was in Vermont and was built under the charter of the Midland Railway of Vermont.

The section last built, from Mansonville to North Troy, was the first to go; train service was discontinued on May 1, 1936, and the rails lifted soon after. Service was discontinued between Windsor Mills and Kingsbury on April 27th, 1940 and two years later rails were lifted between Windsor Mills and Kingsbury and between Eastman and Mansonville. Finally the section between Kingsbury and Valcourt was closed on December 15, 1949, and dismantled soon after. Nothing goes to waste and the station building at Flodden was moved bodily and became Grove Hill station on the lakeshore near Montreal. In the early days, the movement of lumber and farm produce was considerable but today about the only source of revenue is the large snowmobile factory at Valcourt.

LOCOMOTIVES OF THE ORFORD MOUNTAIN RAILWAY.

1. 4-4-0 13x18" 45" 1879 Kingston
2. " " " 1879 Kingston

Originally built for the narrow (3'6") gauge Lake Champlain & St. Lawrence Junction Ry. as no.3 BEDFORD and no.2 ABBOTSFORD. In 1881 became South Eastern Ry.nos. 21 and 20 and converted to standard gauge. No. 1 was bought by the OMR in 1891 and no.2 in 1896.

3. 4-4-0 17x24" 62" 1878 Baldwin #4714

Originally no.5 "EMPRESS OF INDIA" of the Joseph Whitehead contract on the Canadian Pacific Railway. In 1882 became CPR #147; in 1905 #20; bought by the OMR in 1909.

fifteen years of publication

Seems hard to believe fifteen years have passes since General Motors introduced its "Train of Tomorrow" to Canada ... and since trolley buses took over the passenger services of Cornwall's electric street railway system that is still thriving as a freight-only line.

These were the "headline stories" in the predecessor of CANADIAN-RAIL fifteen years ago. The other reports told about CPR's dieselization of its Newport Subdivision, and CNR's acquisition of Buffalo Creek steam locomotives.

The date was October, 1949, as Editor E. Allan Toohey (late) and his Publisher, R. Joedicke, put together the first issue of CRHA News Report. It comprised all of four pages, and was printed by Ditto process through kindness of Canadian Pacific. Both the reproduction process and C.R.H.A.'s resources limited the number of copies possible, so only about 100 copies were printed. Those who still possess their copies today have a rarity indeed -- much sought after by collectors.

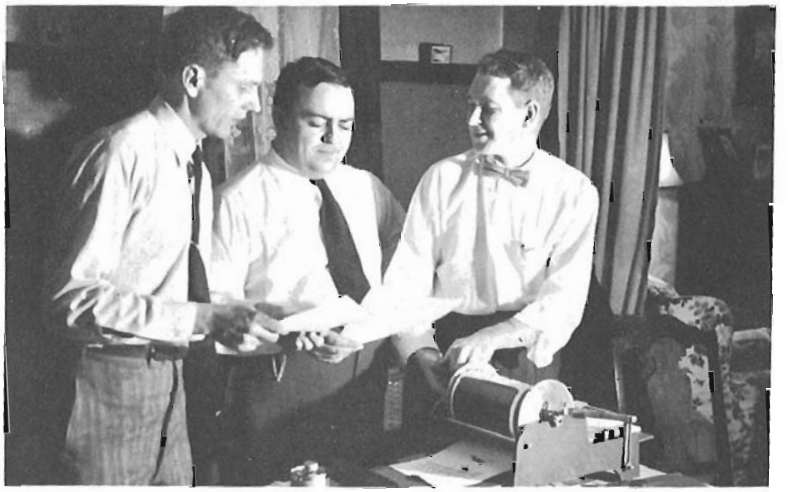
Various processes were used in subsequent issues, which led to the purchase by CRHA of its own mimeograph machine in March, 1952..... Meanwhile, Omer Lavallee had assumed the position of acting editor with the summer 1951 issue, while R. S.Ritchie was acting publisher. Mr. Lavallee became Editor-in-chief in February 1952 ---- and during the succeeding ten years almost single-handedly turned out over one hundred ten editions, averaging ten to twenty pages in each issue.

During this period, photo covers were introduced. They were used first on an irregular basis, beginning July 1957. They were made a permanent feature in December, 1959, when David R.Henderson, now the Director of Publications, took charge of the production. The same issue saw the name of Anthony Clegg added to the masthead. The popular Notes and News section was his responsibility, until turning it over to William Pharoah and now Peter Ganley. The name "Clegg" certainly did not disappear from the publication, however. In February, 1962, Tony became its Editor -- a position he still holds today.

The need for more information to be included in an ever-growing publication led to a big decision whether or not to change from a mimeographed newsletter to a lithographed booklet. In January, 1961, readers were surprised to open their envelopes and see a "new and different" C.R.H.A. News Report, in its brand-new 6" x 9" magazine format.

The benefits were many: now, photos were not limited to the front cover...and imagination could be used in the selection of varied and different type-faces to decorate articles. Model railroaders, too, appreciated the full-page scale diagrams permitted by the new process.

And so the booklet grew -- from twelve pages in the January issue to twice that size and more. Twenty-eight page editions are now common.... and if new subscriptions continue, this "high" may be broken very soon.



Mr. S. S. Worthen, 1952 President, starts first run on Association's own mimeograph machine, while A. Clegg and Editor O.S.A. Lavallee inspect samples of work.

★★★★★★★★★★★★

Somehow, though, with the fancy new printing process, the many photos, and "magazine" look it had developed, the name "CRHA News Report" seemed somewhat out of place. After all, the directors reasoned, the publication was now more than "just a newsletter" -- it was a full-fledged magazine. The search for a new name began. After suggesting, screening and rejecting dozens of suggestions, one stood out as most logical.... CANADIAN RAIL. Being short, it described, quickly and accurately, exactly what the publication covered. Happily, too, the new name precisely duplicated the first twelve letters of the Association's own name.

Readers' reaction to the new title -- and to the continuing improvement of the publication -- has been excellent. This continued support has made possible the production of 228 pages of railway reading matter in CANADIAN RAIL this year alone ... and, of course, there are still two issues to go.

We've been flattered by the many favourable remarks received. And we've been kept on our toes, too, by the occasional note from a customer who has been forgotten.. perhaps hasn't received his issues or has received an invoice when he'd already paid several months ago. All of which reminds us that we're NOT a professional publishing organization, but simply a handful of willing volunteers, who enjoy putting out a magazine which others enjoy reading.

Fifteen years of continuous publication is quite a milestone -- especially when the assembling and collating committee(originally under Kenneth Chivers and now headed by John Saunders) looks back on 159 issues which have had to be stuffed, stamped and mailed to well over 1000 readers across the world.

Thank you so much for your support. In return, we are looking forward to future issues of CANADIAN RAIL that will be even bigger and better -- with more of everything you like ... about railways.

From Japan we have received the following newspaper clipping. We are reproducing it just as our Far East Representative , Mr. William McKeown, sent it to us, illustrating some of the concern about safe train travel on the part of the Japanese public.

THE MAINICHI DAILY NEWS, FRIDAY, MAY 29, 1964

Which's The Safest Coach Of Train?

By Koji Mori
Staff Writer

Which is the safest coach of an interurban electric train? Are Japanese motormen trained sufficiently to carry passengers to their destinations without fear? What measures are taken to safeguard train operations?

These are questions being asked by many commuters who report to their offices from satellite cities and towns. Osaka has five private electric railways — Hankyu, Hanshin, Nankai, Keihan and Kintetsu. Let's check these problems in the case of the Hankyu Line, the biggest commuter carrier among the five.

Operating four lines—Umeda-Kyoto (47.9 kilometers), Umeda-Takarazuka (24.8 kilometers), Takarazuka-Imazu (9.6 kilometers) and Umeda-Kobe (32.5 kilometers), Hankyu carries an average of 2,250,000 passengers a day with transportation revenue amounting to ¥28 million.

The greater part of its 679 coaches running on these lines are modern but there are also coaches dating back as far as the 1930's. Each coach has a capacity for 140 passengers but at the morning and evening peak hours, the number of passengers more than triples the capacity. Here lies the danger.

Working as the core of the Hankyu line are 980 motormen and conductors. The average age of motormen is 34 and that of conductors is 23.5. All form a "crack force" employed after scrupulous medical and mental tests.

Candidates with color-blindness, organic handicaps such as disabled arms and legs and high blood pressure, however slight, are refused entry into the firm. Also, those who are extremely short-tempered or hasty-minded are eliminated through mental tests. This is to check in advance any possibility of their causing accidents.

The motormen's average age of 34 deserves attention. "Already married, a man at this age has discretion," emphasizes Takami Otagaki, chief of Hankyu's Engineering and Transportation Section. "They never become violent in temper like youngsters who drive their vehicles like 'lightning' on the national highways."

Keeping to the speed-limits is the most important job of each motorman. He must always keep his eyes glued to the various devices installed in the motorman's booth while watching the signals outside—a brain-wrecking job.

In this connection, the motorman is advised to get a good night's sleep for at least six hours each day.

Commuters flocking to a train at the morning peak hour at Hankyu's Umeda Station. First coach draws more passengers than any other coach.

Does the motorman actually get a good night's sleep as required? "All in all," says Otagaki, "Yes, they do." But there are exceptions, of course.

Some motormen might drop in at a sake shop and return home very late at night. There also might be one who would chat with, say, a former classmate who had come to see him from far away, forcing him to go to bed after midnight. In these cases, such men can not be said to have had a good sleep of at least "six hours." It is the duty of Otagaki and some other officials to check on such strays.

When a motorman reports to his office in the morning, Otagaki first asks him: "Did you sleep well last night? How many hours did you sleep? How is your condition this morning? Tell me the truth. Even if you lie, your face will give you away, understand?"

Otagaki says some motormen, despite signs of a hangover on their faces, try to conceal the fact that they drank until late the previous night. "What's wrong about drinking?" Otagaki argues. "It's ridiculous to conceal the fact." But to motormen, nothing is more dreaded than to be labelled by their superiors: "What an undependable fellow you are to drink until so late at night when you must work early in the morning!"

To cope with emergencies caused by headaches or stomach-aches, Hankyu keeps a reserve of 15 substitute motormen on hand.

Nobody knows when he will die. Nobody can guarantee that a motorman, no matter how healthy and careful he is, would operate his train safely all the time. What will happen, for instance, if he is suddenly taken by a stroke or fatally injured by a pistol bullet while driving his train?

This is not a matter of assumption. Some time ago, there was an incident on the Hanshin Line (Osaka-Kobe) in which a youth shot his air-gun at a speeding train, although fortunately the motorman was not hit.

Usually Hankyu express trains run at a speed of 110 kilometers per hour in suburban areas. If a motorman collapses due to a heart attack or as a result of some violent act, will the train keep running to ram into another train ahead of it?

"Such a thing is hardly conceivable," say officials, "because our coaches are equipped with deadman's valves, automatically stopping trains in case of emergency." (A motorman always holds the deadman's valve down with his left hand and when he lets go of his hold on the valve, the train stops automatically.)

But a train running at high speed can never come to a halt at once; it often screeches to a stop after running for 500 to 600 meters—too late to avoid a collision, particularly in the morning and evening peak hours when trains pull in and out of stations at short intervals.

Hankyu officials say motormen are subjected to frequent minute medical tests and when they are found to be affected by organic disturbances such as high blood pressure, they are immediately relieved of duty and transferred to some other section. "So, this medical check reduces to almost zero the possibility of a motorman being attacked by a stroke all of a sudden," they say. But to an outside attack, they are helpless.

As to the question of which coach is the safest in a train, officials say: "There is no such safest or most dangerous coach. Any coach is the same."

So far, the middle coaches have been considered the safest. But this belief was broken by the Japanese National Railways' "Tsurumi Accident" which took place in Yokohama City on November 9, last year.

Of the 162 killed, the bulk was riding in the middle coaches which derailed and were hit by another train. Officials said a mishap like the Tsurumi Accident is quite an exception and there is no likelihood that a similar tragedy will occur again in the future.

All the officials interviewed said with one voice: "If you want to know which coach is the safest, judge with common sense. We have no statistics to tell you which one is the safest."

—There is danger of the first coach hitting a truck, bus, or cab stranded on crossings.

—The last coach may be rammed by another train.

—Now, you pick which coach you would like to ride on.

Ironical as this may seem, the most crowded coach on the Hankyu Line in peak hours is the first coach in the case of Osaka-bound trains. Why? Commuters are in a hurry to get to their offices. So they ride in the coach nearest to the exits, so that they can dash to their offices immediately after they get off the train!

Notes and News

-- P. A. Ganley

Canada's two major railways have been named winners of the Public Safety Activities Award of the National Safety Council. CNR and CPR along with 12 U.S. railroads, have received the honor for conducting outstanding programs in 1963 for their employees and for the general public.

CPR has withdrawn its "Faresaver" plan on certain local routes. The railway abandoned reduced rates on its local passenger trains between Montreal, Sherbrooke and Saint John; Toronto and Windsor; Calgary and Edmonton, and Calgary to Fort McLeod and Lethbridge. The change means for example, that a one-way ticket between Torontoand Windsor will cost $8.55, compared with a Faresaver rate of $6.15 every day except Friday and Sunday, when the special rate was $7.40. The CN will continue its fares between Toronto and Windsor at $6.15 and $7.40. After September 30, an even lower fare will be added, $5.15 for travel on most weekdays. A CPR spokesman said the decision to withdraw the Faresaver plan on local routes was made after a 10-month trial that showed that the increase in traffic was not sufficient to offset the fare reduction on the local runs.

CNR received delivery on September 2nd of its most powerful diesels. The two General Motors diesels, numbered no. 4000 and 4001, will be used on freight runs between Montreal and Winnipeg and later they will be used anywhere in Canada. The units generate 2,500 horsepower and were developed to meet the need for a higher capacity locomotive, capable of handling faster freight schedules now in effect.

CP's new $20,000,000 hotel in Montreal will be called "Le Chateau Champlain". N.R. Crump, President of Canadian Pacific, said that "Champlain was Canada's first great Canadian, and the hotel will bear his name as a tribute to a great explorer - the Father of New France - who first saw beyond the frontiers of what is now Quebec to blaze trails westward." The new 620-room, 38 storey hotel is the largest to be built in Canada since the addition of 400 rooms to the Royal York in Toronto in 1959. Construction has already begun and the hotel will be opened early in 1967.

The National Capital Commission at Ottawa has announced details of its rail and Union Station relocation program there. The new station will be relocated from downtown Ottawa to a point three miles south. The new centre will include two merchandise terminals, a telecommunications building and a limited-access road to expedite traffic from the new station to the heart of the city will be built. The program will eliminate about 70 level crossings and 35 miles of tracks.

CNR's recent acquisition of an RDC-1 from the Chicago & Eastern Illinois R.R., has been numbered as D-109. The Budd demonstrator 2960 will not be renumbered while on lease to the railway.

Canada's most modern railway yard, CP's new Toronto freight yard, was opened officially on June 16th. The yard, which has been under construction for four years, has been built to handle some 3,000 railway cars which the company hauls daily in and out of Toronto. The Toronto Yard is the fifth push-button type of classification yard put into operation in recent years by Canada's railways.

The Railway Association of Canada is seeking the support of a number of interested national associations of a move to persuade the provincial governments to make daylight saving time a uniform practice throughout the country. They hope to achieve this in time to enable the railways to observe daylight saving time in their schedules next spring. In its current System bilingual time table, CN explains why it is still necessary to use Standard Time for all its trains.

Comedian Buster Keaton will star in a 16-minute short motion picture for Canadian National Railways to extoll the joys of railway travel through Canada. The filming will take four weeks, during which time he will tour the scenic wonders in his own railroad car. Mr. Keaton is under contract to the National Film Board and the Public Relations Department of the CNR is co-operating with the producers of the film.

The Great Slave Lake Railway crossed the 60th parallel into the Northwest Territories on August 29th with the $86,000,000 project 18 months ahead of schedule. Northern Affairs Minister Laing drove the ceremonial spike marking the crossing of the Alberta-Northwest Territories border. Crews have laid 300 miles of track and the line will be finished in mid-1965.

Word has been received that the Canadian Pacific is advising its agents of drastic curtailments that the railway plans to make in its passenger train services effective with the Change of Time on October 25th. The trains effected are all normally operated with Dayliner (Rail Diesel Car) equipment.

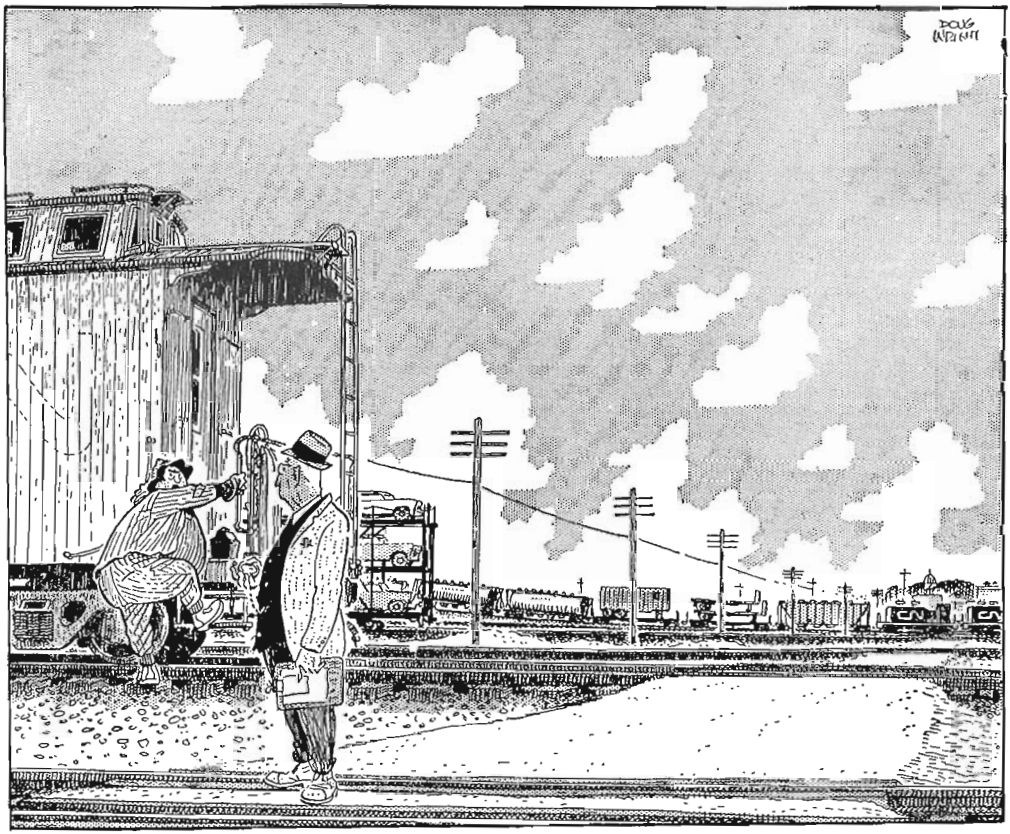
The following trains will be withdrawn:
Dominion Atlantic Ry. Nos. 13, 14, 15 (Kentville-Halifax); 16 (Yarmouth-Halifax); 17 & 20 (Yarmouth-Kentville).
Nos. 202-203, Montreal-Megantic.
Nos. 31-32, Montreal-Farnham. (The position of the Farnham-Boston portion of this service remains unclear).
Nos. 380 to 389 inclusive, comprising two Toronto-Peterboro and one Toronto-Havelock services in each direction, with changes on Saturday and Sunday.
Nos. 132-133 (Dly.), 137-138 (Sat.) - Montreal-Ottawa via Lachute.
In addition, the following trains will operate on a tri-weekly basis instead of daily or six days weekly as formerly:
Nos. 164-167-172, Montreal-Mont Laurier;
Nos. 302-306-307, Toronto-Owen Sound;
Nos. 307-308, Medicine Hat-Lethbridge. The Calgary-Lethbridge service will be reduced from daily to four days weekly, with twice weekly round trips over each route. (Not long ago they were both served daily).

Further details concerning the above C.P. changes and alterations in other Canadian passenger services will be included in next month's Canadian Rail.

Shaughnessy Mines, a few miles north of Lethbridge, is the home of the Province of Alberta's last steam locomotive to operate in regular service. It is a 4-6-0 of uncertain ancestry and works most weekdays -particularly in winter. According to Mr. E. Johnson of Edmonton, who sent us the photo, the locomotive operates only on the sidings at the mine over a few hundred yards of trackage. Its future - in doubt.

Hump

Courtesy Doug Wright – Montreal Star



"Some shipper comes along with a funny-shaped load today they'll build him a special car tomorrow . . . and I'll wait another 20 years for a lower step on this old shack!"

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