

NEWS REPORT NO. 97



FEBRUARY 1958

CANADIAN RAILROAD HISTORICAL ASSOCIATION INCORPORATED.

P.O. BOX 22, STATION "B"
MONTREAL 2, QUEBEC

Notice of Meeting

The February meeting of the Association will be held in room 202, Montreal Transportation Commission Building, 159 Craig Street West, on Wednesday, February 11th, 1959, at 8:15 PM. The entertainment had not been announced at time of printing.

Association News

TRIP COMMITTEE-

Members are asked to particularly note the date of the spring trip, Sunday, May 10th, 1959, when a special, double-headed steam train will be operated from Belleville, Ontario to Bancroft, Ontario and return. Complete details may be obtained from a circular issued by the Committee, which is attached.

RAILWAY DIVISION TRIP

The members of the Railway Division are organizing an excursion over the Canadian National Railways' Montmorency Division, to mark the cessation of electric railway service linking Quebec, Montmorency Falls, Ste. Anne-de-Beaupre and St. Joachim, on Sunday, March 15th. Special train, comprising car 401 and combination car 105, will leave the St. Paul Street station in Quebec, at 1:00 PM, on March 15th, and will return shortly after 5:00 PM. Participants from Montreal and points beyond may go to Quebec from Montreal on CPR train #150, arriving Quebec at 12:20 PM. Return to Montreal may be made on CPR #155, leaving Quebec 6:00 PM and due in Montreal at 10:00 PM, where connections may normally be made for Boston, New York and Toronto.

TICKETS \$2.50 (adults) CHILDREN \$1.25 (ages 5-11)
Children, accompanied, under 5, free.

Proceeds from the excursion will go toward the preservation of some of the former QRL&P Co. rolling stock.

RESERVATIONS are not mandatory, but as the Railway Division may advertise this trip locally in Quebec, those who reserve will be given preference in seating should it be necessary to operate additional equipment. The trip will mark the cessation of seventy years of local train service on the Beaupre coast, fifty-nine of it by electricity.

Railway Division restoration work is going forward at Youville Shop; M&SC car #104 is presently undergoing heavy platform repairs, while restoration of #611 is under way, and a start has been made on MTC #859.

THE STORY OF TUNNELS

The following research paper, which will appear in several consecutive parts, was originally delivered to the Association by the author on December 8th, 1948, as a lecture. While it is not confined to Canadian subject matter, the tunnels which have been selected for elaboration are chosen because the author feels that they illustrate stages in the development of this engineering field which will enable the reader to grasp the topic comprehensively.

-- Omer S.A. Lavallée

ANCIENT AND MEDIAEVAL TUNNELS

For the origin of man-made tunnelling, it will be necessary to go back far before railways, even in their most primitive form, were ever thought of. The earliest tunnel recorded by history was built, as might be expected, in Babylon. As one of the earliest seats of culture, it is only natural that the Babylonians should have developed the original artificial tunnels. We have already ascribed to them the distinction of having erected one of the first man-made bridges; Babylon was also the supposed site of the "Tower of Babel" or Temple of Belus, which is reputed to have reached a height of 600 feet --- the world's first "skyscraper". Thus we see that as engineers, the Babylonians were hardly to be considered as amateurs. This early tunnel was quite an ambitious project. Its very magnitude points unmistakably to some previous experience on the part of its constructors, and though it is history's first recorded tunnel, it is unquestionably not the first ever constructed nor even among the first.

This particular tunnel was situated under the Euphrates River which divided the city of Babylon into two parts. Brick lined, as we know from our knowledge of the construction methods of these early people, it is estimated to have been no less than 3,000 feet in length. The portion under the River was approximately 600 feet long, and the tunnel connected the Royal Palace with a Temple.

The method of construction was quite interesting. The Euphrates, like the Nile, varied in its volume of water from Season to Season, and ranged from a near-flood stage in the wet season to a mere brook connecting a series of still ponds, during the dry period. It is apparent that the river was diverted into a temporary channel during this dry season and the tunnel constructed under the bed of the river by the "cut and cover" method which is presently used for underground railway construction in modern cities. The brick used for the tunnel lining was joined together with asphalt, and the resulting brick tube was covered over with the river-bed material.

The dimensions are given as having been twelve

feet wide and fifteen feet high. It is interesting to observe that a modern subway train might pass through this tube with ease! Sufficient evidence remains to show, however, that this tunnel was built some time between 2180 and 2160 B.C. Thus we picture the first underwater passage known. Strangely, four thousand years were to elapse before the second underwater tunnel, the Thames Tunnel, was completed at London, England in 1843.

The art of tunnelling, and other engineering skills, passed naturally from the Babylonians and Egyptians (who constructed tunnels into hills for use as temples and tombs, etc.) to the Greeks and the Romans. Before looking at the works of the latter, let us examine some tunnelling attempts of the Hebrews.

Everyone is acquainted with the Biblical story of the fall of Jericho, accomplished by the marching of the Israelites, under the leadership of Joshua, around the walls of the city for a week, after which the walls were said to have fallen flat. The theory has been advanced that while the greater part of Joshua's forces were marching about and creating a general noise, a smaller number of men were undermining the walls. The weight of logic is lent to this interpretation as it is known that this method had been used in contemporary warfare to hasten the fall of walled towns.

While the Jericho incident is simple conjecture, a tunnel was discovered about fifty years ago which was used to carry water to the Pool of the Virgins inside the walls of ancient Jerusalem, from the Pool of Siloam which was located outside. Though the pools were only a little over one hundred feet apart, the tunnel is some 600 feet long as it is laid out in the form of the letter "S". This structure was small, about two feet wide, and was probably built in the Eighth Century B.C.

Passing to the Greeks, we find a tunnel situated on the isle of Samos almost a mile in length, and some six feet square in section. This bore was described by Herodotus, and is estimated to have been built about 687 B.C. The tunnel passes through a limestone mountain 900 feet high. It appears to have been worked from both ends, as it is quite straight with the exception of a bend which might suggest that the workmen employed in its construction could hear each other's hammers and were consequently able to effect a joining of the two headings by altering their respective courses.

One of the more outstanding tunnels in the Roman Empire was that carrying a road through the Posilipe Hill near Naples. This tunnel was about 25 feet wide and 3,000 feet long. Its portals were about seventy-five feet high and converged towards the middle for purposes of illumination. It is said to have been built during the reign of Augustus. Mention is also made of a number of tunnels used in connection with the many Roman aqueducts, some as much as three and a half miles in length. One of these Roman aqueducts, modernized, is still used in the city of Athens.

Another tunnelling undertaking of great magnitude, constructed by the early Christians, was the Roman catacombs. These constituted an innumerable number of passages in as many as seven tiers of galleries. Their length has been estimated at no less than six hundred miles.

After the fall of the Roman Empire, the "World State" in A.D. 476, the period of intellectual stagnation known as the Dark Ages fell upon the world, and the great structural accomplishments of the Romans and Greeks were allowed to crumble into ruins, to remain but faintly in the mind of Man.

Ten centuries elapse before we reach the next stage in our story of tunnels. In the middle of the fifteenth century, Anne, Duchess of Savoy, known by her contemporaries as one of the outstanding intellectuals of her time, caused a tunnel to be commenced on the important road over a pass known as the Col di Tenda, 6,158 feet in altitude, between France and northwest Italy. At that time, and for 250 years afterward, this pass was considered one of the best and easiest, and the tunnel was projected to be built approximately thirteen hundred feet below the summit of the pass and was to have been almost two miles in length. It appears beyond doubt that the project was begun, but at Anne's death in 1463, it was abandoned. The excavations were resumed between 1782 and 1794 at the instance of Victor Amadeus III, the King of Savoy, but in the latter year, due to the invasion of Savoy by the French, the work was stopped once again. By this time, approximately 8,200 feet of tunnel had been excavated. Shortly after, Napoleon caused the road over the pass to be improved for carriage traffic. With some alterations, the works were carried to a successful conclusion in 1883 by the completion of a tunnel about a mile and a half in length, still used for road traffic.

Up to the time of the beginning of the Col di Tenda Tunnel, the work of boring tunnels was accomplished almost entirely by hand hammers and chisels, though the ancients knew the method of dashing water over rocks that had previously been heated by building fires against them, causing the rocks to split, though the resulting debris was cleared away by hand. The first use of an explosive in the construction of a tunnel was on the occasion of building the Languedoc Canal Tunnel in France about 1680, when gunpowder was used, having been placed in holes in the rock. This tunnel was drilled through soft limestone. The Languedoc Tunnel was the forerunner of a wave of tunnel-building which ensued during the next two-and-a-half centuries primarily for canals, as the levels of waterways were necessarily required to be uniform, the use of locks for grade changes being made only to a very limited extent.

The canals and tunnels predominated in England, and were quite numerous in America. They continued to multiply until the advent of the railway, which promptly seized the initiative in tunnel-building, and has held it ever since. Before passing to the railways, let us review the construction

of the Thames Vehicular Tunnel, which was mentioned earlier and which marked an important stage in the development of the subject of this paper.

First projects for boring under the Thames were made about 1800, and were followed by innumerable alternative suggestions. The first actual work was begun in 1807 when a small bore tunnel was begun from a shaft at Rotherhithe. This tunnel, projected to run to Limehouse, proceeded for 1,046 feet (about two-thirds of its planned length) at which location the pressure of the river broke through and flooded the whole undertaking.

In 1824, the final and successful attempt was made by Mr. (afterwards Sir) Marc Brunel. Brunel had patented a primitive form of square shield in 1818. On four occasions, the first on the 18th of May, 1827, the river broke into the tunnel and was responsible for the suspension of the works during a seven-year period, from 1829 to 1836 but the tunnel was finally completed in 1843 after having cost the equivalent of \$2,350,000.00. Even with its completion, the tunnel was used only for pedestrian purposes, its ends being located in shafts at either end reached by spiral staircases. Eventually, in 1866, it was sold to the East London Railway for the use of trains, being enlarged and opened on December 6th, 1869.

EARLY RAILWAY TUNNELS

Among the earliest railway tunnels, we find that we must award the distinction for the first one to a small horse-tramroad in France running between Roanne and Andrezieux, near Lyons. In 1826, a tunnel was begun near St. Etienne to serve this line and it was known as the Terre Noire (Black Earth) Tunnel.

The first steam railway tunnel was built shortly afterward, and was located in Great Britain on the line of the Canterbury and Whitstable Railway. This line was operated by a variety of motive power: steam locomotives, three stationary engines, and horses. The steam locomotive was Stephenson's "Invicta" and was operated for a short time only. Locomotive operation was suspended and was not resumed until 1844 when the line was leased to the South Eastern Railway. The tunnel, which was driven through Tyler's Hill, in Kent, was very narrow at the Whitstable end and its dimensions restricted the size of rolling stock in use for the whole period of its operation which lasted until 1933 when the passenger service was withdrawn. It has an amusing story connected with its construction, and the reasons therefore.

The surveyor of the line was one John Dixon, who was later associated with George Stephenson in the construction of the Liverpool and Manchester Railway. Dixon chose what was described as "an easy, suitable route through Blean"; but when the route proposals were put before the Canterbury Committee, one of the members asked "What, no Tunnel?". Then the other members of the Committee objected vociferously, "No tunnel? We must have a tunnel!!" -- and, since the Canterbury people insisted on having a tunnel, Dixon's plans were rejected and

Stephenson himself was asked to journey to Canterbury and plan out a route with a nice tunnel in it. As altered, the route was undulating and picturesque enough to please anyone who did not mind paying for it, and it contained everything no discriminating railroad should be without.

England took the lead in railway building and in tunnel construction and in 1845, the Woodhead Tunnel on the Sheffield, Ashton-under-Lyne and Manchester Railway, with a length of three miles and thirteen yards was opened for traffic. It retained the distinction of being the longest tunnel in the kingdom until the Standegge Tunnel on the Huddersfield and Manchester Railway was opened in 1848. This tunnel had a length of 3 miles and 60 yards and was not superseded in length until 1886 when the Severn Tunnel was completed. The Standegge Tunnel consists of three parallel tunnels, one carrying a double line and the other two each carrying a single track, four tracks in all. The double tunnel is 3 miles 60 yards in length and the other two 3 miles 57 yards. There is also a fourth tunnel carrying a canal of approximately the same length, which was begun in 1794 and completed in 1811. We are told that the bargemen were accustomed to laying down on the barge decks and propelling the craft forward by pushing against the low tunnel roof with their feet. After the opening of the original railway tunnel in 1848, the second single line tunnel was opened in 1870 and the double track tunnel in 1894. The double track tunnel is the only railway tunnel in the world in which track water troughs have been laid; they are situated just inside the western entrance adjacent to Diggle Station. This unique location was compelled by the fact that the stretch of railway in the tunnel is about the only appreciable length of level track all the way from Manchester to Leeds.

There is also the Bramhope Tunnel between Harrogate and Leeds, which was opened in 1849. It is 2 miles and 234 yards in length. The country through which the line is carried is very difficult and the bore pierces the ridge between Airedale and Wharfedale. The construction of this tunnel was considered one of the most difficult of its time by its engineers, and before it was completed, twenty shafts had to be sunk with depths ranging from 70 to more than 400 feet. During the construction of this double track structure, it is estimated that some 1,560,000,000 gallons of water had to be pumped from the workings. Standing in a churchyard nearby is a monument to 30 men who were drowned by the penetration of water into the workings. The monument is a small scale reproduction of the northern portal of the tunnel.

THE SEVERN TUNNEL

Proposals for the construction of a tunnel under the Severn estuary to shorten the then-existing circuitous route between London and the south of Wales were first made in 1863. Several attempts were made to

undertake the construction of this ambitious project but they failed for economic reasons.

On June 27th, 1872, however, necessary legislation was passed enabling the Great Western Railway to construct such a tunnel and its approaches and the preliminary work of exploring the strata by driving headings under the river was begun in March 1873.

Up until 1879, railway traffic between London and South Wales went by way of Gloucester. This route had been completed in 1852. In 1879 a Severn Bridge was completed crossing the river at Sharpness, some 15 miles southwest of Gloucester, but it was realized that the completion of a tunnel would cut another fifteen miles from the Severn Bridge route and construction proceeded with vigour. There was some apprehension on the part of the engineers in charge of the tunnel construction concerning possible infiltration of water from the river, especially under a particularly deep channel of the river known as "The Shoots". At this point, the path of the tunnel lay some 44 feet below the bed of this channel.

Their fears were unfounded, however, and indeed it was later found that relatively little trouble had been experienced from the Severn itself, though there were two very serious floodings. These inundations strangely enough did not come from the Severn but from an underground river afterwards known as the Great Spring, the presence of which, until that time, was unsuspected. The fissure through which this spring flows cuts across the line of the tunnel approximately one-quarter mile inland from the west, or Monmouthshire, bank.

The first flooding occurred on the sixteenth of October, 1879 when the headings driven from each side of the river were within four hundred feet of each other. In spite of this serious setback, it was decided to proceed with the construction and the work was given into the charge of Sir John Hawkshaw who had, until that time, acted as construction engineer. Sir John had had previous experience in sub-aqueous tunnel construction in the extension of the East London Railway under the London docks.

The works were not free of water until December 1880 and the construction which had come to a halt, was taken up once more. A second flooding from the "Great Spring" was experienced on October 10th, 1883 but it was not of so serious a nature as the first, even though the actual opening of the tunnel was delayed for the completion of additional pumps to deal with the water.

In April 1885, the last length of brickwork was finally completed, in spite of the serious setbacks, and the tunnel was opened for goods trains on September 1st, 1886. Passenger service was inaugurated on the following December 1st. Of the five working shafts used during construction, two have been retained for ventilation; one at the Sea Wall on the Gloucestershire side, and the other at Sudbrook on the Monmouthshire shore. The draft through the tunnel is increased by a fan in the Sudbrook shaft. For many years, a suction fan proved quite satisfactory but the increasing number and weight of trains made conditions progressively worse. In 1924, an induction fan 27 feet in diameter and driven at 60 r.p.m. by an 800 horsepower steam engine was installed. This fan can clear one

mile of tunnel on each side of its shaft in about five minutes.

Drainage is another serious problem and calls for special arrangements to meet its special conditions. The water from the aforementioned Great Spring is intercepted before it reaches the tunnel and is led away through a brick lined culvert to a well-shaft at the Sudbrook pumping station. It is at this point pumped to the surface and discharged into the Severn. This water is of no negligible quantity. Its daily average is somewhere in the neighbourhood of 20,000,000 gallons.

Water entering the tunnel by means of the approach cuttings at each end and by seepage through the roof and walls is carried away by means of a 2'6" invert culvert, which is connected to well-shafts and pumps at Sudbrook, Sea Wall, and a third shaft situated about $1\frac{1}{2}$ miles from the western end of the tunnel.

Most of the tunnel is completely dry, including the portion under the aforementioned deep channel, which is under a 170-foot head of water at high tide. Its excellent condition requires a thorough inspection and the effecting of minor repairs which are carried out on consecutive Sundays for several weeks each year. At such times, the brickwork is examined thoroughly and is struck with hammers at intervals of about one square yard. Any areas with a hollow sound are, of course, noted, and arrangements are then made to have the particular section of brickwork renewed.

Rail corrosion is heavy and the average track life is less than three years. About $1\frac{1}{2}$ miles of complete relaying and $1\frac{3}{4}$ miles of rerailing are carried out each year. New steel work is given a coat of carbon tar before use.

The Severn Tunnel is 4 miles 628 yards in length, and is the longest tunnel on British Railways. It is the longest underwater tunnel in the world. At high tide, two and one half miles of tunnel are under water, but at low tide a considerable expanse of rocks is left uncovered and the channel is about one-quarter of a mile wide. The eastern or Gloucestershire bank entrance to the Severn Tunnel is $\frac{3}{8}$ of a mile from the river bank and descends on a 1% grade to its lowest point, 45 feet below the bed of the river. A level section of track 800 feet in length separates this grade from the beginning of the ascent to the Monmouthshire or western entrance of the tunnel with a grade of 0.9%. Nearly $1\frac{3}{4}$ miles of the tunnel on the western end are under land. The tunnel carries a double track throughout its length. The maximum width at seven feet above track level is 26 feet, and the clearance in the centre, 20 feet. It is used by approximately 150 trains per day, and its construction cost the Great Western Railway nearly £2,000,000.

(to be continued)

Members and subscribers who have not yet remitted for 1959 are respectfully reminded that this is the last issue they will receive. Members who have not yet paid for 1959 should remit \$3.00 and subscribers should remit \$2.00 to: C.R.H.A., Box 22, Station B, Montreal 2.

..... *The Art of Writing Letters*
Railroad Section, 1879 Division,
by Lorne C. Perry.

IN A GAS-LIT OFFICE at No.202 St. James Street in the Montreal of eighty years ago, there sat a man who almost daily wrote epistles sufficiently barbed as to strike fear into the hearts of the recipients. Most of these poor people were dependent upon him for their jobs.

This outspoken man was C. Fred^{ck} Sinn, Auditor of the old South Eastern Railway, employer and critic of numerous station agents in the Eastern Townships of Quebec. His letters, hand written either by himself or by secretaries, were copied into a letterbook which recently came to light and which has been presented to the Canadian Railroad Historical Association.

The poor, unsuspecting station agent would first hear from Mr. Sinn in a letter exuding sweetness and light. Such was the letter written to Thomas Chapman at Brome, Que., on September 9, 1879.

It reads as follows:

" Dear Sir,

I am instructed to inform you that it has been decided to appoint you agent for the Company at Brome Corner Station. If you will let me know what day it will suit you, I come and meet you and instruct you. It would be well if you could go to Sutton for a couple of days with Mr. Shepard and pick up the routine of Station Agent work so that you will not be entirely green at it when you do take charge. "

This was followed by another friendly letter nine days later.

" Dear Sir,

You will receive this evening a table and top for your stationery and an office chair. I have written the superintendent to furnish you with scales, stove and lamps. Books, tickets and stationery will be sent to you tomorrow. Trusting that you will soon learn station work and try to keep everything neat and tidy, I am yours truly, "#

But in December, the blow fell. Mr. Chapman, by then firmly entrenched as an agent, received this letter from Mr. Sinn:

" Dear Sir,

How is it you report as having issued from Brome Corner to Sutton Flat in October only ticket number "0". There have been collected by conductors also numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15. Mostly all these tickets have been made good to return. How is this. Say who authorized you to do so, and why are all the tickets not reported for the month they were sold. "

And many other blows fell on many other heads. It is perhaps well that there was no long distance 'phone at the time; the wires would have melted. As it was, the Sinn envelopes must have been warm to handle; and with a name like Sinn, I imagine he was well supplied with nicknames.

Here is one that must have set Agent Cleaveland's knees to knocking when he read it in the West Brome depot on the 22nd day of June, 1879.

" Dear Sir,

As an employee of the South Eastern Railway Company, you are expected to keep your communications from the Head Office to yourself and should not in any case be sent to foreign roads. You were very wrong when you sent my letter respecting sale of Grand Trunk issue of tickets to Grand Trunk Agent and should such occur again in future, it will be sufficient cause of your dismissal. "

The Agent at Sutton, mentioned in the first letter quoted above, came in for his share of Mr. Sinn's ire. The Mr. Lovering in this letter was the General Agent of the Passumpsic Railroad, Lyndonville, Vermont.

" Dear Sir,

Every month I am more or less bothered by your exchange reports, but this month's crowns all the rest. The last letter I received from Mr. Lovering today is rather showing too much carelessness on your part and is causing one a deal of trouble. You must be careful when you get orders to exchange. It will not do to put an imaginary number after the harm is done. You cause Mr. Lovering as well as myself a great deal of annoyance and hunting up errors, which can be avoided if you do your work well. I trust you will not leave yourself open to be reported again. "

He considered it necessary to write very clearly and carefully to the Agent at Acton on the subject of proper balance sheet preparation.

" I notice you put in one item the whole amount for the month while there is a place provided on the balance sheet for the cash remitted at the end of each week. Passenger money goes under the heading Passenger. Freight money goes under the heading Freight. The balance sheet is so simple that it requires careful reading it over and anybody can make it out correctly, only follow the reading. "

Sometimes, Mr. Sinn employed sarcasm to get his point across:

" Agent, Waterloo.

Dear Sir,

I received a letter from Cowansville complaining that he wrote you three times and telegraphed once about discrepancies between your station and his, and he can get no reply. I wrote him some time ago about these discrepancies and getting no reply felt annoyed and was somewhat severe on Cowansville for not replying. He is certainly not to blame if he cannot get you to even acknowledge his letters. Do like a good fellow take the trouble and reply to letters you receive from agents (there is none of us perfect) and maintain a good spirit amongst the employees. "

Every so often he had to write pacifying his opposite number on the Passumpsic Railroad with which the South Eastern did a considerable business. The subject was always, late passenger reports. On October 7, 1879, he wrote a gem of a letter, no doubt with tongue in cheek.

" Dear Sir,

You are right in presuming that it is beyond my control that my passenger reports reach you late. The Grand Trunk and other railways we do business with, send their returns hardly ever, and in fact I have even received reports from you not much earlier than the latter part of the month. They were always welcome when received. I am sorry to be obliged to accept the name of a tardy scholar, but never mind, the most innocent have to suffer for the sins of the sulprits at times and I dare say, as long as I am willing to stand the blunt my friends will put it on. "

Balance sheets were again the subject of a letter, this time to the Yamaska agent:

" Dear Sir,

I am sorry to find that you do not pay the attention you should do to your monthly reports. Your balance sheet for May shows lack of neatness. I am obliged to return it and must ask you to check over the freight you forwarded from your copy book with your abstract book. When everything is correctly entered, go to work and make out a new Balance Sheet.

I did not think I would have any trouble with you having been with Mr. Miller so long and under Mr. Phelps. I recommended you to take charge of Yamaska and I trust you will do your best in future to keep your position. Anything but carelessness !! "

The last phrase seemed to be his motto. But look at this cute letter he was obliged to write to his boss, at a later date:

" A.B. Chaffee, Esq.,
Secretary-Treasurer, S.E.Ry.,
Montreal.

Dear Sir,

Enclosed please find our ticket report to Missisquoi Railway corrected. It seems ridiculous that I should have made such an error in footing. When Mr. Alden asked me to make out this report I was busy with other accounts and in the hurry omitted carrying the hundreds into the total amount. I am sorry this mistake occurred. "

This is the only recorded Sinn sin.

NEW YORK CENTRAL SLEEPING
CARS SOLD TO CANADIAN PACIFIC

During the month of January, Canadian Pacific Railway took delivery of eight sleeping cars from the New York Central Railroad. Four of the cars, of 10-roomette, 5 double-bedroom design, named CASCADE FAUN, CASCADE LANE, CASCADE MIST and CASCADE RUN, are finished in NYC two-tone grey paint scheme, while the other four cars, equipped with 5 double-bedrooms, buffet-solarium-lounge are of the "beavertail" design and are finished in stainless steel fluting. The latter cars bear names FALL BROOK, SINGING BROOK, PLUM BROOK and BABBLING BROOK. They are presently being shopped at Angus.

....High wheels which roll no more ...

by Forster A.Kemp

CANADIAN PACIFIC'S LAST 3000 SCRAPPED

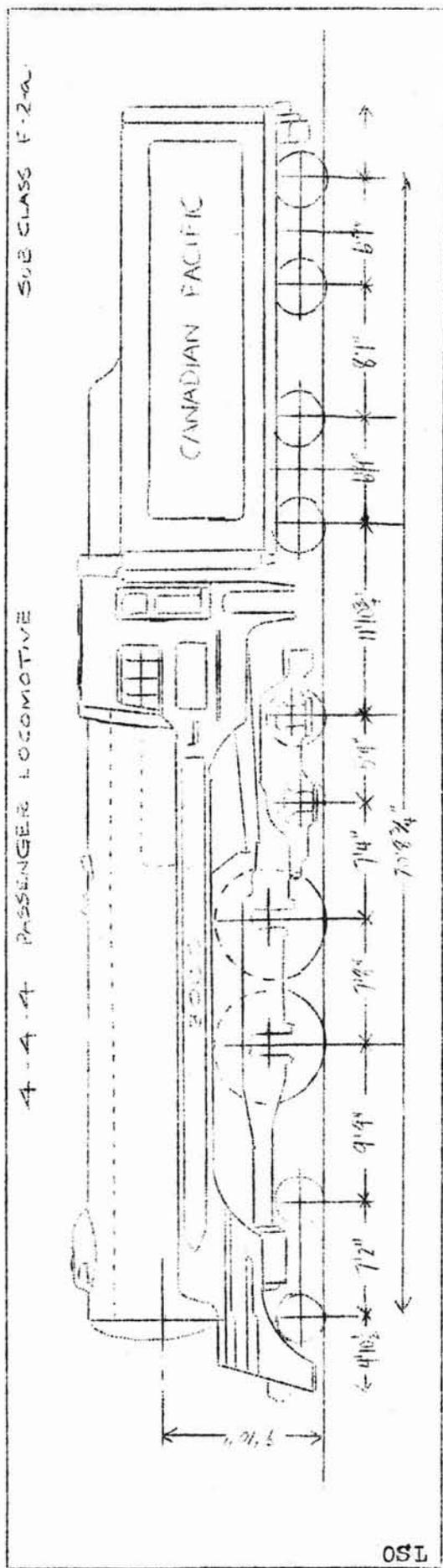
EARLY IN THE YEAR 1936, at the east-end Montreal plant of Montreal plant of Montreal Locomotive Works Limited, there rolled into the daylight a locomotive of a type not found previously in Canada. Stream-styled from pilot to tender coaming, its smooth-topped jacketing concealed a smaller boiler than might be supposed, but when steam was raised, the gauge needle rose to 300 lbs. The wheels attracted much attention for there were only four driving wheels of Box-Pok design and of 80 inches diameter ! This immediately called to mind the Atlantics of 1899, but behind them followed an idler truck almost as large as that of a Hudson type. The reason for this could be seen only upon close examination, for the engine had a cast-steel engine bed. Cylinders were fairly small and all rods were lightweight and of molybdenum steel. Familiar attributes such as whistle, bell and sand dome were looked for in vain; they were concealed under the cowlings. Even the front coupler was discreetly hidden under the great, metal-banded pilot.

Here, then, was an innovation on the CPR; an engine built to haul passenger trains at great speeds: semi-streamlined and of a rare wheel arrangement. As the Company was celebrating the fiftieth anniversary of the completion of its line between Montreal and Vancouver, the type was called the "Jubilee" Type. In succeeding months, there were a total of five of these engines outshopped. Designated Class F-2-a, they bore works numbers 62822 to 62826 and road numbers 3000 to 3004.

Lightweight passenger cars had been built to go with them, and four trains were soon marked in public timetables as being "semi-streamlined and air-conditioned" on runs between Montreal and Quebec, Toronto and Detroit and Calgary and Edmonton. Local trains 349, 350, 351 and 352 were powered by engines 3003 and 3004 (Montreal-Quebec), engines 3000 and 3002 were assigned to the Toronto-Detroit trains 37 and 38, and 3001 hauled Calgary-Edmonton trains 525 and 526, "The Chinook".

The outbreak of war in 1939 brought about changes in both the engines and their trains, although they remained in the same areas. Trains 37 and 38 became too heavy for the "Jubilees" and they assumed local runs between Toronto and London, and London and Windsor. The equipment of the Montreal-Quebec locals was reassigned, the fast schedules were lengthened out (by $1\frac{1}{2}$ hours, in one instance!) and Nos. 3003-3004 were hauling clattering, gas-lit wooden coaches. Only the "Chinook" retained something of its former splendour. Some of the streamlined appearance of the engines also disappeared through the years. A plain stack was applied; the bell reappeared on top of the boiler sheathing (apparently for better sound projection and elimination of the snow problem). The grillwork in front of the smokebox casing, which formed part of a smoke deflecting device, was filled in, and the cover over the front coupler was removed. However, these few changes did little to alter the engine's distinctive general appearance.

After the war, a new, fast train service was put on between Toronto and London, Ont. Numbered 629 and 630, it allowed six hours' shopping or business time in Toronto, with a schedule of 2 hours, 15 minutes, in each direction. This train was usually hauled by a 3000 series engine. New, lightweight coaches soon appeared on most of the runs of the 3000s.



Of course, these engines hauled other trains from time to time; there was a braking test held on the Winchester Subdivision in which an official speed of 115 miles per hour was reached. Also remembered was the "Parliamentary Special". To encourage Montreal and Quebec MP's to attend Friday evening sittings in the House of Commons, a special train left Ottawa at 11:00 PM. Hauled by engine 2927, a 4-4-4 of a later and smaller design, it consisted of a baggage car, coach and two sleepers (one a buffet-lounge). A fast run brought it to Montreal West about 12:45 AM. Here, engine 3004 would be waiting with another baggage car and a coach. A sleeper was transferred from one train to the other, and then 3004 would leave for Trois Rivieres, where it would overtake the overnight train No.358. The two trains were combined and continued at a more leisurely pace to Quebec.

The F2a class were "slippery" engines, and needed a deft hand on the throttle and plenty of sand to keep the high wheels from spinning uselessly. Although designed for passenger service, they hauled freight trains after being overhauled, to allow new bearings to run in at moderate speeds. As may be imagined, they were not highly thought of by freight enginemen!

SPECIFICATIONS, Class F2, subclass F2a

Boiler pressure	300#in. ²
FIREbox width, inside	70-3/16"
" length "	114-1/16"
No. and dia. of tubes	47, 2 1/4"
" flues	120, 3 1/2"
Length of tubes	18'10-3/16"
Superheater	Type "E"
Cylinders	17 1/2 x 28"
Driving Wheels	80"
Weight on driving wheels ..	120,000#
Loaded weight of engine ...	263,000#
Light weight of engine	243,900#
Loaded weight of tender ...	198,500#
Light weight of tender	98,000#
Water capacity,	
Imperial gallons ...	7,000
Coal capacity, tons	12
Tractive Effort	26,500#

THE "beginning of the end" came for these engines in 1953, when a new speed rival appeared in the form of the Budd Rail Diesel Car, which became known on the C.P.R. as the "Dayliner". Trains 629 and 630 were the first trains to be replaced by these stainless steel, self-propelled vehicles, but the 3000s got their comeuppance on weekends, when the traffic overtaxed the Dayliner's capacity. Steam trains were often substituted and these often included the RDC units. Similar practices took place on the Calgary-Edmonton and Montreal-Quebec runs after they were replaced by RDCs. This gave rise to a famous photograph, showing engine 3004 with train 349 (two Budd cars and a coach) on a Saturday morning. This appeared in a large US publication, much to the chagrin of the RDC builders !

As the number of RDCs increased, the Jubilees were used less frequently and began appearing in dead lines at Ogden and Angus. 3002, 3003 and 3001 fell before the scrap-cutters' torches. 3000 finished out her time on 635 and 634 between London and Windsor while 3004 languished in Glen roundhouse in Montreal, occasionally taking a Saturday turn to Ottawa or a transfer to Angus. On each of these occasions, she was an object of much comment. "3004 was out today"; "where'd she go?"; "Ottawa, on 427", etc. At the end of 1957, 3000 ran her last mile, was brought to Angus and broken up. 3004 went to London to replace her, but not for long, however. Many of us remember when she arrived back at St.Luc. Shabby and dirty, she was hauled back and forth by a diesel switcher during the Association's visit to St.Luc on March 29th, 1958.

After this came several months of ignominious rusting at Angus Shops. During October, this last of the F2a's was stripped of a few more accessories and took her place in the "dead line" of engines ready for scrap. Late on the evening of November 14th, with five others, No.3004 was pushed into the yard of the reclaim dock. On Monday, November 17th, the scrap cutters began their work and by Friday, nothing remained but her builders' plate of cast aluminum, which was committed to our Association in remembrance of a noble class of locomotives, considered by many to be the Canadian Pacific's finest achievement in engine design.

NEW STATUS FOR ELECTRIC ENGINES
ON C.N. SUBSIDIARY LINES

Effective December 31st, 1958, electric locomotives on two Canadian National Railways subsidiaries, and a diesel locomotive on a third, are to be reported

with Canadian National's Southern Ontario District motive power reports.

The engines concerned are: Niagara, St.Catharines & Toronto Railway Nos. 8, 14, 15, 16, 17, 18, 19, 20, 21; Oshawa Railway 300, 325, 326, 327, 400, 401, 402, 403. The diesel locomotive is Thousand Islands Railway No.500.

Effective the same date, the St.Clair Tunnel Company engines in the Canadian National 150 and 170 series were eliminated from the reports, indicating official removal from service.

Speculation continues to surround the possible fate of the six electric locomotives operating on the Montmorency Subdivision, Nos. 225, 226, 227, 228, 229 and 230, which will become surplus after the electric operation on this line ceases on March 15th. There is some indication that these engines may find their way to the remaining lines.

FAREWELL

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EXCURSION

oooooooooooooooooooo IN CNR (ex QRL&PCo)
CARS 401 AND 105.

SUNDAY MARCH 15

1959.

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IN CONNECTION with the cessation of electric railway service on the Montmorency Subdivision of the Canadian National Railways, which will take effect with the close of operations for March 15th, 1959, a "Farewell Excursion" will be operated on Sunday, March 15th, 1959, from Quebec to St. Joachim, Que., and return, stopping at Montmorency Falls, Ste. Anne de Beaupre, and other photograph locations. Trip is being operated by members of the Railway Division, Canadian Railroad Historical Association, proceeds going toward the preservation of certain of the line's rolling stock.

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TICKETS:	Adults	\$2.50
	Children, 5-11	1.25
	" under 5	free

SCHEDULE:	Special Train leaves Quebec :	1:00 PM
	" returns " :	5:15 PM

Participants from Montreal and beyond, may go to Quebec on CPR train #150, arriving Quebec 12:20 PM. Returning to Montreal, CPR train #155 leaves 6:00 PM, has dining car facilities, and is due in Montreal at 10:00 PM. Provided train is on time, connection may be made at Montreal West for Boston, and at Montreal for New York and Toronto.

These times are given for information only, and are not guaranteed, and are subject to change without notice.

Reservation blank: Railway Division, C.R.H.A.,
Box 22, Station B, Montreal 2m Canada.

PLEASE RESERVE _____ tickets @ \$2.50 -- \$ _____
 _____ " 1.25 -- _____

Total enclosed (Canadian funds or equivalent) \$ _____

From: _____ (Name)
 _____ (Address)

S P R I N G E X C U R S I O N

Sponsored by

THE CANADIAN RAILROAD HISTORICAL ASSOCIATION
in co-operation with
THE UPPER CANADA RAILWAY SOCIETY, OF TORONTO

Sunday, May 10th a MOGUL and a 2-8-0 will double-head a STEAM rail trip to be operated over the lines of the lines of the Canadian National Railways. This rare combination of steam power will travel from Belleville, Ontario (113 miles east of Toronto) through picturesque country to Bancroft - returning via Trenton Junction. Several photo stops and movie runs are planned on a leisurely schedule. Refreshments will be available. Come and enjoy a spring day on and about a steam train, a friendly chat with fellow rail enthusiasts, and take home some good photos of a never-to-be-forgotten event while these STEAM locomotives are still available.

Belleville is readily accessible to those from the eastern United States and Canada. The special train will leave Belleville at 7:45 a.m. E.S.T. and return about 6:10 p.m. E.S.T.

Send cheque or money order in Canadian Funds - \$8.00 for adults and \$4.00 for the junior steam enthusiasts (5 to 11 years of age).

Tickets and additional information are available from:
Passenger Agent, Canadian Railroad Historical Association,
P. O. Box 22, Station B, Montreal 2, Canada.

WELCOME ABOARD!

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NOTE: For the convenience of those travelling to Belleville from Montreal or through Montreal the C.R.H.A. will provide a special-occupancy 24 section roomette car on C.N.R. train No. 19 leaving Montreal (Central Station) at 8:35 p.m. E.S.T. Saturday, May 9th with occupancy in Belleville until 7:45 a.m. E.S.T. Roomette car will return on train No. 118 leaving Belleville at 12:25 a.m. (occupancy in Belleville at 10:00 p.m.) arriving in Montreal at 6:55 a.m. FARE - \$23.25 includes first class week-end fare to Belleville and return plus roomette section for two nights. Accommodation on this car is limited; please reserve early.

TRIP COMMITTEE