

June, 1954 - Number 101

The first of three summer meetings of the Society will be held on Friday, June 18<sup>th</sup>. Members will meet at the CNR Danforth Station in Toronto's east end for an evening of train observation on the main line. Time of meeting will be 7:30 P.M.

C.R.H.A. BULLETIN 17 - "Halifax — Birney Stronghold" is the title of a 22-page bulletin covering, in thorough fashion the history of the electric railways of Halifax. The bulletin is illustrated with photos and maps and contains an extensive equipment roster. Copies are available at 50¢ apiece from the Association's editorial office, 6959 De l'Epee Avenue, Montreal 15, QC.

T.T.C. — FEDERATION TO CAUSE CARLINE ABANDONMENT  
AND NEW LOOP CONSTRUCTION

For the second time in 1954, the TTC routing system will undergo a violent upheaval on July 1<sup>st</sup>, although in this instance, the suburban routes (principally bus) are the most affected. However, a sudden and unexpected portion of the reroutings consists of the cutting back of the Kingston Road carline to the City Limits at Victoria Park Avenue, and its replacement by an inward extension of the Scarboro bus route. The Bingham Loop at the City Limits has had the north track of the two in the right-of-way section removed, where across-platform transferring between cars and buses will take place. The Kingston Road carline will continue, with the same service as previously operated, between Bingham Loop and McCaul Loop, and combined with the Coxwell route evenings, Saturdays and Sundays. The Kingston Road Tripper route, which has heretofore terminated at Bingham Loop, will continue unchanged.

A consoling thought is the recent TTC statement that it will not remove street cars from the city portion of the Kingston Road route, expressway threats notwithstanding. Nevertheless, the Bingham — Birchmount extension with its rail still in excellent condition (laid in 1928) will now stand unused, and the residents of Birchcliff, who have enjoyed direct downtown service for 26 years, suddenly find themselves with reduced service and an enforced transfer.

Other rail lines affected on July 1<sup>st</sup> are the Oakwood, Rogers, Queen and Long Branch routes. The two first named will now be included in the central zone with free transfers exchanged with the whole central system. The Long Branch route is to operate west of the Humber only, with the Queen route extended on Lake Shore Road, to the Humber Loop, although some cars will continue to turn back at Parkside. Central zone service will thus be reinstated along the section of Lake Shore Road from which it was removed over 15 years ago. A new double loop will be constructed to allow Long Branch and Queen cars to turn back without having their paths cross.

Long Branch will remain as the only suburban street car route, in two zones with the split at Dwight Avenue. Fares on the route will be 4 tickets for 30 cents or 15 cents cash per zone, with a "two-zone combination" rate of 8 tickets for \$1.00 for any two-zone ride. A trip from downtown to Long Branch Loop will henceforth cost a minimum of 22.5 cents.

C.P.R. BRANCH LINE CONSTRUCTION

The Canadian Pacific Railway has completed construction of the new 1.5 mile spur line in south-west Oshawa from the main line to the new General Motors south plant. Despite the short length of this new branch, considerable bridging expense was involved as the line has to pass over both the CNR main line and 4-lane highway # 401.

➤ Contracts have been let and construction started on the new 16½ mile line from Havelock

to Nephthton, Ontario, which will serve the line of the American Nepheline Company.

➤ The two major railways are studying the commuter traffic on the lines to the western suburbs of Montreal (see *Newsletter 96*) with a view to the possible pooling of the service on the closely paralleling lines. It is supposed that, were the pool plan to be put into effect, commuter trains on the CNR line would not run west of Dorval.

#### EQUIPMENT DATA SECTION

#### NO. 6 — NEW CNR FIRST CLASS CARS

Car numbers:	first order: 5437 to 5597	
	second order: 5598 to 5634	
Builder:	Canadian Car & Foundry Company, 1953-54	
Construction:	Steel, welded sides Roof: Arch	
Length overall:	85 ft., 4½ ins.	Width overall: 9 ft., 11¼ ins.
Height:	13 ft., 6 ins.	Vestibule: one end only
Truck centres:	59 ft., 6 ins.	Trucks: Commonwealth 4-wheel
Seating capacity:	80 (52 main compartment, 28 smoking compartment)	
Weight empty:	131,000 lbs.	Seats: Heywood-Wakefield "Sleepy Hollow"
Exterior colour scheme:	Black roof, black below windows, remainder green, paint areas separated by yellow stripe, another stripe along bottom of body. Maple leaf insignia near ends.	

These 218 cars form the larger portion of the 359-car modernization of the passenger equipment of the Canadian National Railways. (The other 141 units, consisting of sleeping and dining cars, have been reviewed here previously). The new coaches feature a variety of interior basic colour schemes — blue, green, brown and rose. All interior finish in the cars consists of plastic panels, no paint being used.

#### HISTORICAL REVIEW OF THE C.N.R. STRATFORD LOCOMOTIVE SHOPS

By H. Spencer, Shop Engineer (Retired), Canadian National Railways

#### *Concluded*

TYPES OF LOCOMOTIVES HANDLED IN 1888 - Practically all road locomotives in use up to the middle '80's were of the 4-4-0 type, weighing 35 to 40 tons in working order (locomotive only), with haulage ratings of 13 to 15%. Switchers were mostly of the 0-4-0 type weighing from 20 to 33 tons, the weight depending on whether they were equipped with Saddle Tanks or separate tenders. Haulage rating varied from 8 to 15%.

By the late '80's road locomotives had undergone development into freight and passenger classes. The 4-4-0 was retained for passenger work, but was built heavier, up to 45 tons and more, with haulage ratings of 17 and 18%. For freight work, the 2-6-0 or Mogul type was raged displacing the 4-4-0, these early Moguls weighing 53 tons with a haulage rating of 18%.

Around the turn of the century still larger classes of freight Moguls were introduced. These weighed 81 tons and had a 28% haulage rating. The 4-6-0 type appeared for handling heavier passenger trains. They weighed 88 tons with 24% H.R.

By 1902, when these heavier classes of motive power reached the shop for overhaul, it was evident that the larger steel framed tenders had grown beyond the facilities available in the 1888 Tender Shop. The locomotives were too long for convenient handling by the Erecting Shop; for a time the Ten-wheelers were sent to Montreal, where a number of pits had been lengthened specially to handle them. The demand for brass castings and heavier forgings also dictated the urgency for larger furnaces and forging equipment.

SHOP ENLARGEMENT 1904 - Plans were developed in 1903 for the building of a new Tender Shop, 103 ft. by 342 ft., with a woodshop annex of 60 ft. by 110 ft. This shop featured a transfer table and a 25-ton electric overhead crane, the first electric crane in Stratford Shop. A new Brass Foundry, 40 ft. by 71 ft. and an addition to the east end of the Blacksmith and old Tender Shops measuring 50 x 160 ft. These addition built the total floor area up to 185,966 sq. ft. by the end of 1904.

The name "Light Repair Shop" was given to the portion of the new addition extending in front of the former Tender Shop, which was provided with two entrance tracks, each of which were equipped with drop pits and a pneumatic jack for removing and replacing locomotive driving wheels.

Electric lighting came to Stratford Shop during the winter of 1901-02 when a series of carbon filament bulbs on drop cords was installed in the Machine and Erecting Shops. Up to this time light had been provided by kerosene lamps at machines and by hand torches elsewhere in the shop.

By 1906 it became evident that the Machine, Erecting and Boiler Shops, built in 1888, had become woefully inadequate to handle the heavier classes of 2-6-0 and 4-6-0 locomotives, to say nothing of the new Consolidation type engines weighing 95 tons, with a haulage rating of 40%.

Studies began in the fall of 1906 to devise a shop layout that would take care of the repair work to all existing classes of locomotives, plus a margin for future growth in size and weight.

When the shop arrangement had been determined, the designing and engineering supervision of the new structure was entrusted to the Arnold Company of Chicago, a firm of Designing and Construction Specialists.

1908 RECONSTRUCTION - Dimensions of the buildings included in this program were as follows: Erecting Shop 70 x 616 ft., containing 28 locomotive pits, spaced on 22 ft. centres; Machine Shop, main floor 105 x 616 ft., with gallery 45 x 616 ft., Boiler Shop 135 x 154 ft. At the same time the old 35 ft. turntable was replaced by a new 85 ft. turntable installed in the yard south of the main buildings, with track for incoming locomotives leading to Pit 20 in the new Erecting Shop.

Construction commenced in August of 1907, and completion was effected in January, 1909. The work was carried out in two stages, commencing at the west end adjacent to Nelson Street and working eastward. This was necessary due to the fact that the new structure had to be erected around the site of the existing buildings, and it was imperative that repairs to as many locomotives as possible be carried out during the construction period. As a start, the 1888 Boiler Shop was demolished and the new structure erected and closed in from the Nelson Street end to a point just beyond the incoming track at Pit 20. This section was then provided with one 10-ton overhead electric crane in the Machine Shop bay and one 10-ton and a 120-ton crane in the erecting bay.

Large timbers were placed on the floor in the Boiler Erecting Bay to act as temporary pits for small locomotives to augment the eight full size pits then available in the Erecting Shop. This portion of the new shop was placed in operation during the late winter of 1908, although the east end of it was practically wide open to the elements. The old Erecting Shop and part of the Machine Shop were then demolished progressively with erecting of the new building following closely behind.

The building design incorporated steel and reinforced concrete construction, with large window and skylight areas for adequate day lighting. The west end of the building is on filled ground, and it was necessary to drive piles under the wall and column footings of the Boiler Shop area and part of the Machine and Erecting Shop.

Many modern motor driven machines were purchased and installed at this period, and others still in serviceable condition converted from belt to motor drive, thus commencing the trend away from the group belt drive formerly in vogue in the old shop. Concurrently with the building of the new shop, a new power plant, 90 x 108 ft., was provided, containing boilers, electric generators, air compressors, pumps and other mechanical equipment.

At the conclusion of the 1908 expansion program, the total shop floor area was 275,510 sq. ft. which remained constant for 40 years, until the addition in 1948 of a 33 x 50 ft. tender finishing and inspection porch.

CRANE CAPACITY GREATLY INCREASED - The handling of the larger and heavier locomotives which were introduced after 1908 was made possible only by successive increases in the capacity of the Erecting Shop locomotive lifting crane. The heaviest class of motive power handled by the 120-ton capacity crane when installed in 1908, was the present N-4-a class (2-8-0) weighing 95 tons. In 1911, the K-3 Pacific type weighing 102 tons was introduced, followed in 1915 by the first group of S-1 Mikados weighing 127 tons.

In order to handle the Mikados more safely, the gear ratio on the existing 60-ton crane trolleys was reduced to provide greater lifting power as a temporary measure until new trolleys of greater capacity could be secured. Two trolleys, each of 75 tons capacity were received and installed in 1919, thus raising the overall capacity of the crane to 150 tons and again providing a margin for the future.

By the middle 1920's, the U-1 (4-8-2) and T-2 (2-10-2) classes, weighing 170 and 180 tons respectively, were in service. Once again the Erecting Shop crane was overloaded necessitating the purchase in 1928 of a completely new crane of 200 tons capacity. This new crane was designed with a wheelbase double that of the old 120-ton crane, in order to prevent overloading of the building structure. During the years that this crane has been in service its capacity has not been exceeded, but the greater numbers of U-1, U-2, U-3, U-4, T-2 and K-5 classes of locomotives now being handled by it brought about an extremely congested condition within all sub-departments of the shop.

ABSORPTION INTO CANADIAN NATIONAL RAILWAYS - Even after the turn of the century, other railroads were absorbed by the Grand Trunk Railway, but these absorptions had little or no effect on Stratford Shop at the time. However, by 1922, it became the turn of the GTR system to be merged into the Canadian National Railways. This event brought about the closure of still further small repair shops with resultant removal of some of their machinery and personnel to Stratford Shop. These latter moves were as follows:

- locomotive portion of the Canadian Northern Shop at Leaside closed, March 31, 1926, with machinery and personnel moved to other shops, including Stratford.
- Machinery and staff employed on self-propelled cars transferred to Stratford from Toronto Shop (Spadina) in July 1933.
- Staff employed at Leaside roundhouse on repairing work equipment transferred to Stratford, June 1934.

ERECTING SHOP ANNEX, BUILT 1948-49 - The decision resulted from the extremely congested condition within all sub-departments of the shop to construct an annex 50 x 583 ft. along the south side of the Erecting Shop into which a number of sub-departments could be moved from other locations in the shop, thus providing urgently needed expansion for all congested areas.

The annex is of steel frame construction with brick walls on a concrete foundation; a 15-ton electric travelling crane runs the full 583 ft. length of the buildings. Two cleaning vats for general cleaning of locomotive parts have been installed in the annex, replacing vats formerly located in the open air.

LOCOMOTIVE LIGHTING UP SHED, BUILT 1950 - Stratford Shop had never been equipped with a closed building fully equipped exclusively for the purpose of firing up and inspection of locomotives, both before and after test runs when turned out of the shop. Previously all locomotives were fired up on outdoor tracks south of the shop buildings, after which, in extremely wet and cold weather, they could be moved inside of the east end of the Light Repair Shop for inspection and adjustment.

This operation is now carried on in a concrete block and steel building, 40 ft. by 110 ft., covering two through tracks with doors at each end. The building will accommodate two of the largest locomotives presently in service. Each track is equipped with a long pit for inspection purposes under both engine and tender. Other facilities include water, steam and oil lines for firing up, electric outlets for welders and extension lights, oxy-acetylene connections for cutting torches and welders, and compressed air connections in the pits for pneumatic tools.

The 1948-1950 additions brought the total area of the shop buildings to 313,020 sq. ft. The increase in shop space in 42 years amounted to only 13.5%, although the maximum weight of locomotive handled increased during this period by 90%.

Two new boilers were installed in the power house in 1949, replacing two of the four smaller boilers which dated from 1908.

IMPROVED METHODS THROUGH YEARS - Electric welding machines were introduced in 1910, first used for building up worn parts only. They have now become indispensable in fabricating all types of plate and structural work. The above equipment was followed shortly by the oxy-acetylene process for metal cutting and welding, and again later by an oxygraph shape cutting machine for shape cutting of parts from blank forgings, billets and plates.

Oil fired furnaces, which were introduced early in the century in the Spring Department, were replaced with controlled temperature electric furnaces, resulting in a more uniform product with attendant longer service life. These furnaces were adopted for case hardening operations, and more recently for annealing and stress relieving new forgings and parts reclaimed by the electric welding process, as well as other locomotive parts such as Brake and Spring Gear removed at regular shopping periods for restoration to original standards.

Commencing in the early 1920's various types of grinding machines were introduced for production of more accurate locomotive parts such as Piston Rods, Motion Pins, Side Rod Bores, Crank Pins, Driving Axles, Air and Feedwater Pumps and similar items. The metal spraying process has been adopted for restoring usable worn parts; within the past few years, Magnaflux testing equipment has been introduced for the purpose of detecting flaws and stress fractures in vital locomotive parts, many of which formerly went undetected; it has thus been possible to remove from service any such defective parts and reduce costly road failures to a minimum.

➤ The Ottawa Transportation Commission recently scrapped weed-killer car 88 because the weed-toxic compound had caused serious deterioration of the car body. No. 88 was originally a single truck wood monitor roof passenger car of the same number.

The OTC Hull line seems to be in grave danger of abandonment because of pressure from the Federal District Commission for the removal of all overhead wires from Wellington Street. The plan to relocate the tracks on the new Chaudiere Bridges has apparently been given up. In the event that the Hull line was abandoned, the St. Patrick - Lindenlea ends of the route would probably be joined with the Preston route, giving the OTC a system of four basic street car routes.