August, 1951 - Number 67

The tenth anniversary celebration of the Society is now definitely planned to take place in the form of a banquet. This banquet is scheduled to be held on Friday, October 19th., the regular UCRS meeting night. This will bring the occasion to within two days of the actual tenth anniversary, as the first meeting of the Society in its present form was held on October 17th., 1941. Further details regarding the banquet will be made know later.

THE RAILWAYS OF SOUTHERN ONTARIO - A BRIEF ANALYSIS OF GEOGRAPHICAL INFLUENCES IN LOCATION

By the Editor

The most direct geographical control over railroads is topography. Other controls of a geographical nature, though there be many, do not operate as universally or in such a striking manner as does the form of land over which the track has been laid.

The pioneer lines in what is now Southern Ontario were built generally speaking, in the 1850's and 1860's and were primarily concerned in connecting the then existing large towns by the most direct route possible, or connecting "backwoods" locations with the main routes as branch lines. From the 1870's on until just before the First World War, another class of railway was constructed through the province. Many of these connected the same end termini as the pioneer lines, but these secondary routes were more concerned with tapping towns and areas along the way that the early lines had missed. In many cases these later lines destroyed the usefulness and caused the eventual abandonment of the very early branch routes. In very brief and simplified form, this was the large scale factor in the location of most of the railways of Southern Ontario.

However, the small scale factor in location, that which operates locally, was the topography encountered by the railways en-route. This always intervened in such a way as to divert the line away from its objective unless bridges were built, fills constructed and cuttings dug. A constant problem was before the location engineers whether to build around obstacles, thereby maintaining an easy grade, or to endeavour to surmount the obstacle, sacrificing the easy grade for a straighter route. There had to be a compromise between physical factors and the ultimate objective of the line.

In Southern Ontario, the relations between land and water bodies are fundamental to the railroad pattern. The main objective of the trunk railways is to give east - west service. North - south lines on the American continent are most important on the seaboard and between Chicago and New Orleans. Elsewhere, the north - south flow of traffic is, generally, "across the grain", and east west movement predominate. Southern Ontario fits this rule. It may be stated that one of the most important routes is out of Toronto to the north, but it should be realised that this is only its temporary direction, and the bulk of the traffic eventually goes west above Lake Superior.

The water bodies of the Great Lakes have forced a channelisation of traffic in Southern Ontario to a marked degree and the trunk lines are closer together here than (e.G.) south of the Lakes in Ohio where there was more room for them to spread out. The CNR and CPR main lines are forced to hug, or remain fairly close to the north shore of Lake Ontario in order to find easier construction routes. Had the rougher terrain of the Canadian Shield interposed to a larger extent, construction would have been much more difficult, and the lines as finished probably would not have been as satisfactory.

But it is in southwestern Ontario that channelling effects are most evident. The shape of Lake Erie and Huron narrow the peninsula to the southwest, so that in Middlesex and Elgin counties there are five east-west trunk lines inside of a north-south distance of thirty miles. Four of these are aimed at Detroit (and eventually Chicago and other U.S. points), while the fifth, the CNR's line to Sarnia, seeks Chicago by crossing into Michigan immediately below the south end of Lake Huron. Lake Erie has a particularly important effect in this channelling; the great motor city of Detroit is cut off from direct easterly connection with the eastern portion of the U.S. through American territory. A circuitous route must be followed via Toledo and Cleveland if an all - U.S. route is desired. However, by building or obtaining trackage rights through Canada, the American lines were able to obtain a much shorter route to the Buffalo gateway, and three of them (now NYC, C&O and Wabash) took advantage of this. The New York Central has the lion's share of the traffic between these points. although the Chesapeake and Ohio (on NYC trackage east of St. Thomas), and the Wabash (trackage rights on CNR through Ontario) have substantial freight traffic between Detroit and Buffalo - Niagara Falls also. As is the Essex County peninsula, the Niagara peninsula is a funnelling agent also.

Looking at the "Ontario Island" (a term given to that portion of Southern Ontario lying generally north of a line connecting Goderich and Toronto), we see that through routes pass only along its southern and eastern fringes; elsewhere in the counties of Dufferin, Grey, Bruce and Huron, and the northern parts of Perth, Waterloo and Wellington, the railroads are purely local with traffic bound for or originating from nearby points. There is rather a complicated net of lines in the Ontario Island, centring on Palmerston and Harriston, but they are all of a branch line nature, with small locomotives and short trains. This pert of Southern Ontario is a kind of "jumping off place", with this designation increasingly apt as one moves north-westwards towards the Bruce Peninsula. The, shapes of Lake Huron and Georgian Bay are responsible for this situation: had Georgian Bay not been present, the lines to western Canada from Toronto could have cut across the Ontario Island, and the whole region would probably have had more large cities and industries than is the case under existing circumstances. (A railroad was once projected to run up the Bruce Peninsula, across Manitoulin Island and the North Channel to the north shore, but this ambitious scheme never got beyond the paper stage).

Returning to topographical controls: The most striking physical feature of Southern Ontario, and that which affects railroad location the most, is the Niagara Escarpment which cuts across the South-western peninsula of the province at its narrow point, and continues into the Bruce Peninsula and Manitoulin Island. This is crossed by 14 railroads, all of which have made the ascent along the southern half of the escarpment extent in Ontario. None has crossed north of the Caledon "mountain" line of the CPR, which was one of the most difficult climbs that a railway was forced to make in Southern Ontario. Most of the railway lines have managed to find places where the cuesta has been subdued by moraine (glacial hills), giving an easier grade or else a stream valley which has dissected the escarpment face providing an easier route to the top. However, one or two, notably the CNR line from Hamilton to Jarvis, resorted to a long switchback type of climb, attaching the escarpment in as bold a manner as possible.

The glacial topography of Southern Ontario has had much to do with railroad location also, although conditions presented are seldom as severe as those associated with the Niagara escarpment. The morainic hills, such as the Paris- Galt system, and the hummocky moraine of the Dundas valley, result often in a rather crooked route for the railways. The oval-shaped glacial hills known as drumlins give their troubles too particularly when the railroad is being built at right angles to the direction of trend of the drumlin axes. A good example of this is the CNR's old Midland Railway of Canada line east from Peterborough to Hastings. Glacial forms can be of a benefit

to a railway also - spillway valleys often provide a fairly level routes through the confused topography of surrounding morainic hills. There is a danger of these resulting in a circuitous route if followed too far however; an example of this would seem to be the now abandoned electric line of the Toronto Suburban Railway east of Guelph.

The problem of bridging is a major one in railroading, and it is intimately connected with geography. If a route is to be at all direct, rivers may be expected every few miles. If the railroad follows the base level of drainage closely, i.e. the shore line of a lake to which the rivers drain, the bridges will not have to be long or high. However, if the railroad locates a certain distance back in the hinterland at a higher elevation it will in all probability encounter deeply incised stream valleys, each of which presents a bridging problem. This principle is demonstrated along the north shore of Lake Ontario where the three east-west lines located very close, at times parallel, to each other, and close to the Lake shore. Flat, low topography extends far inland from the north shore of Lake Erie and the railways here could locate inland in order to obtain a more direct route - the rivers here are not deeply incised.

"Watershed" routes (crossing rivers near their point of origin or missing them altogether) occur in a few places in Southern Ontario. They have few if any bridges, but curves of a heavy nature are necessary to keep to such a location. The Toronto Grey & Bruce line of the CPR to Owen Sound is largely a watershed route once it tops the escarpment, but this is more likely than not an accident.

Finally there are those physiographic forms which aid, rather than hinder railroad construction. These are characterised by an absence of relief, and correspondingly, an absence of curves and grades except on a larger scale, on the rail lines which cross them. Sand and clay plains seem to be the most favourable sections in Southern Ontario for straight and level railroad construction, and their effect is best evident in the extreme south western portion of the province. The railroads in Lambton, Kent and Essex counties were built easily and cheaply, as the surface of these counties is composed almost wholly of level sand and clay plains; at the same time there is little elevation above the levels of nearby lakes and the stream are small and easily bridged.

The CNR line from Komoka Junction to Chatham travels 55 miles in an absolutely straight line. On the CPR, NYC and C&O nearby, there are other long straight stretches.

The clay plains of the Niagara Peninsula also allowed railroad construction to be easily undertaken, although there are a number of rather deeper stream valleys to be bridged than in the Chatham - Windsor area.

Most of the rest of Southern Ontario is covered by rolling "till" plains - in these sections cheaply and hastily constructed railways may well be crooked and hilly (such as the CNR's Uxbridge Subdivision north from Scarborough Junction), while a reasonable amount of cutting and filling usually enabled a very satisfactory type of railroad line, not excessively difficult or costly to construct.

Study of the inch to a mile scale topographical maps issued by the Department of National Defence can be much more revealing as to the railroad geography of Southern Ontario than any amount of description and all of the principles briefly touched on in this article can be seen in great detail through the use of these maps.

LOCOMOTIVE NEWS

By George W. Horner and R. F. Corley

The Canadian Pacific Railway has ordered 18 more 1500 h.p. FP-7 road diesel units from General Motors Diesel Limited. Fourteen of these are to be cabless "B" units, numbered 4424 - 4437 while the remaining four will be "A" units 4038 - 4041. These are all for use on the Calgary - Revelstoke run along with existing "A" units 4028 - 4037 now on the dieselized Schrieber Division. They

will form 14 two unit (A-B) 3000 h.p. locomotives.

Ten 1000 h.p. Road freight "A" units have been order from Montreal; these will be numbered 4042 - 4051, and will be used on the Schrieber Division in place of 4028 - 4037. The Schrieber Division will have after arrival of these units, the following locomotives in service:

4088 - 4027	1500 h.p. "A"
4042 - 4051	1600 h.p. "A"
4404 - 4423	1500 h.p. "B"
7063	1000 h.p. switcher - at White River
7087	1000 h.p. switcher - at Chapleau
7094	1000 h.p. switcher - at Cartier
8405 - 8408	1500 h.p. Road-Switcher

On July 20th., the CNR's historical locomotive No. 40 came out of Stratford shop with a Canadian National herald on the tender. The locomotive was then hauled to Kingston where it participated in "Kingston Diesel Day" celebration on August 1st. in connection with the entry into production of locomotives by the Canadian Fairbanks-Morse Company at the Canadian Locomotive Company's plant.

Also at this celebration was the CNR's original oil-electric switcher 7700 (now 77). Two special trains were run from Toronto and Montreal to Kingston for this occasion.

Recently scrapped CNR engines are:

(2-6-0) 746 on June 27th.
(2-6-0) 818 on June 28th.
(0-6-0)7305 on June 29th.

Niagara, St. Catharines & Toronto Railway No. 8 was returned to its home property from the Oshawa Railway during the last week of July. Montreal & Southern Counties locomotive 325 (III) is now operating on the Oshawa Railway.

The CPR has converted diesel switchers 7038 and 7039 for use with the auxiliary hump units B100 and B101 at Cote St. Luc Yard. Four other switchers have been converted to Multiple Unit control for service in the Montreal area. These are Nos. 7100, 7106, 7107 and 7108. The work was done on these units by MLW-GE.

The Algoma Central and Hudson Bay Railway has five 1500 h.p. GP-7 switchers of GMD manufacture in service (No. 150 - 154), and has ordered seven more of the same type (Nos. 155 - 161).

1000 h.p. switcher No. 102 was shipped to the Alma and Jonquiere Railway in July from Montreal Locomotive Works.

NEW CNR SUMMER TRAIN

The Canadian National Railways have instituted a new summer pool train know as "The Lakeshore Express" in both directions between Toronto and Montreal, operating daily from June 24th. to September 29th.. It covers the 333.4 miles in 6:55 hours and runs in advance of the regular pool trains 5 and 14 which make the trip in something over eight hours.

Schedules are as follows:

Pool 8	Pool 14			Pool 5	Pool 7
9:15 a.m.	9:15 a.m.	LV	TORONTO ARR	5:25 p.m.	3:15 p.m.
4:10 a.m	5.45 p.m.	ARR	MONTREAL	LV 9:15 a.m.	8:20 a.m.