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of steady agitation a complete survey for such a project was authorized by the Canadian Government in 1904 and an interim report on the survey was laid before the Houses of Parliament in July of last year. It is probable that the final report giving in detail all results of the surveys will be ready for presentation during the coming session of Parliament.

It will be well before proceeding further to review, very briefly, the physical characteristics of the route of this proposed waterway. A glance at the accompanying maps and profile will show both its directness and the singular chain of deep lakes and rivers lying along it. The late A. M. Wellington, who was for years one of the most enthusiastic advocates of this route, has described it as "the finest place on the globe for a deep-water canal." Long reaches of navigable water occur, which need no improvement whatever. In fact the existing waterway is a succession of deep, almost currentless pools connected together by short streams broken by rapids and waterfalls. For this reason the water level does not fluctuate with great rapidity, seldom rising more than three inches in twenty-four hours for any considerable number of days in succession.

Geologically and topographically, the character of the surrounding country is broadly divided at a point close to the city of Ottawa. To the westward lies an Archæan region, composed mostly of diorite, gneiss and granite, abrupt, broken and bare, and with well-defined and deep valleys; in this section are occasional large patches of level-lying and fertile Cambro-Silurian country. To the eastward is a Cambro-Silurian region bordered close to the north shore of the Ottawa River by Archæan; this region is generally level-lying, but it is divided by well-defined outcrops, which form the natural dams that hold back the long deep-water reaches of the lower river. Permanent raising of the water levels will not be objectionable in the western section, where the channels are narrow and deep, but in the eastern section the river shores are flat, low and well-cultivated, and flooding is, therefore, an economic impossibility.

As in the case of all northern canals, the climatic conditions, which will limit the period of navigation to approximately seven months, are the most serious drawbacks to the efficient working of the route. It is estimated by the engineers that the waterway will be open, on an average, for 210 days in the year, this estimate agreeing closely with the figures for Lake Nipissing given by the Deep Waterways Commission in 1896. It was estimated at that time that Lake Nipissing would be closed by ice from November 20th to May 3rd, a period of 155 days. That climate will place the Georgian Bay Ship Canal at a disadvantage when compared with the existing St. Lawrence Canals can be readily seen from the following dates of the opening and closing of navigation taken from the report of the Deep Waterways Commission—

Place.	Average date of closing.	Average date of opening.
Port Arthur	December 21st	May 1st
Sault Ste. Marie	December 2nd	April 30th
Welland Canal	December 10th	April 17th
Lake Nipissing	November 19th	May 3rd
Lachine Canal (Montreal)	December 2nd	April 30th

It is hardly possible from these dates to avoid the conclusion that the northern waterway will have a navigation season nearly a fortnight shorter than that which can be obtained for the proposed enlarged canals on the St. Lawrence route.

A mental picture of the route, then, will show between Montreal and Ottawa, or, say, one-fourth of the length, a broad, placid river, broken by three groups of rapids and flowing between fertile and well-cultivated shores. This section has been navigable for nearly eighty years, and the present enterprise will merely enlarge the scale of the navigation. For 190 miles further to the westward the route still follows the Ottawa River. This section has been long the highway of the lumberman, but has remained little known to general commerce. The broad, placid pools and well-settled banks are still found, but the river is broken more frequently, more roughly and for longer distances by the rapids, the character of the valley changing swiftly with the change in its geology and islands of great size becoming a feature of the river. Old and well-established towns are on the banks, but settlement is by no means dense. It is hardly thirty years since the Canadian Pacific Railway reached Mattawa, the western end of the section. The building of the ship canal would give to this part of the river opportunities for development which it has never yet had, all through navigation now terminating at Ottawa.

The third section from the Ottawa River to the Georgian Bay runs through a succession of pools, with high, rocky banks. It is a much-broken region, with its streams sometimes divided into two or three parallel branches, its areas little settled and less cultivated, and, like most Archæan country, it is not attractive to the agriculturist. It was unopened to commerce in any effective way until the Canadian Pacific Railway was built through it twenty-five years ago.

The surveys, which have been under the general direction of Mr. E. Lafleur, Chief Engineer of the Department of Public Works, and Mr. A. St. Laurent, Engineer-in-Charge of the Georgian Bay Canal Survey, have been carried through with great thoroughness, the work done including general surveys, precision levels, borings, soundings, establishment of water levels at the various stages, studies of river regulation, hydrographic surveys of tributary watersheds, studies of power development, of the requirements of modern navigation, of the handling of large freighters, and of the details of lock construction. No plans have as yet been made public, and the drawings accompanying this article are prepared from the results of earlier surveys; in major detail the design can be but little altered, the natural features being so well marked and on so grand a scale.

The interim report places the length of the wate-way at 440 miles, and for over 410 miles it will not be canal, but lake or canalized river. The general route has already been sufficiently described. The stretches of canal are found near the summit and near Montreal, but it is questionable whether the latter sections will ever be built or whether the locality does not justify a much bolder scheme of river improvement in spite of the expense entailed. The cut across the divide between the waters of the French and Ottawa Rivers is 31/2 miles long, and a stretch of three miles of canal is projected in the valley of the Mattawa River, where the fall is comparatively rapid. These are the longest sections of actual canal except the section near Montreal. From the foot of the Lake of Two Mountains, out of which the Ottawa flows to its final discharge into the St. Lawrence in four separate branches, two routes are projected, the one following Lake St. Louis and the St. Lawrence River to Montreal, and the other the valley of the Back River or Rivière des Prairies. The Back River is the main stream of the Ottawa, and flows at the back of the Island of Montreal, discharging into the St. Lawrence at Bout de l'Ile, a point about seventeen miles east of the centre of Montreal harbor. Owing to the expense of right-of-way and the artificial obstacles that are necessarily found in the environs of a great city, about five miles of actual canal have been recommended on the first route and about eleven miles on the second.

In the natural waterways about 332 miles require no improvement whatsoever, for an additional fourteen miles a broad waterway can be secured by the cutting off of a few small shoals, and there will be about 66 miles of channel or submerged canal to be built. Locks of the ordinary type are to be used, the dimensions of the lock chambers being given as 650 feet by 65 feet by 22 feet on the mitre sills. It is not considered that there will be any lake vessels designed in the immediate future to draw more than 20 feet of water. It is true that the St. Mary River channel is being deepened to 25 feet and that the Canadian lake terminals are being dredged to the same standard, but the extra five feet are considered necessary to provide for the free movement of vessels drawing 20 feet, and also for those sudden falls in the lake levels which occasionally occur as a result of severe wind storms. Twenty-foot navigation at all stages is still