

R E P O R T
OF
THOMAS C. KEEFER, ESQ., C. E.
OF SURVEY OF
GEORGIAN BAY CANAL

ROUTE TO LAKE ONTARIO,

BY WAY OF

Lake Scugog, accompanied with Maps, &c.

ORDERED BY THE COUNCIL OF ONTARIO,
JUNE SESSION, 1863.

WHITBY, C. W.

W. H. HIGGINS, COUNTY BOOK AND JOB PRINTER, BROCK STREET

1863.

CORRECTION.

PORT WHITBY—well known as one of the best Harbors on Lake Ontario—has been inadvertently omitted from the Map. The omission was discovered too late to make the proper correction.

REPORT
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INTRODUCTION.

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THE following Report is the result of a Survey ordered by the County Council of Ontario, in pursuance of a recommendation in the Report of the Standing Committee on Roads and Bridges appointed by that body, as follows :—

“ That in view of the importance, of having the
“ advantages of a Canal Route through this County,
“ duly ascertained ; your Committee would recom-
“ mend that a sum not exceeding \$600, be appro-
“ priated in ascertaining by a Survey, the advantages
“ and practicability, of a route through this County
“ for the making a Canal connecting the Georgian
“ Bay, with Lake Ontario, and that the same be ex-
“ pended under the direction of your Committee.”

The appropriation was only designed to obtain a *preliminary* Survey, shewing the practicability of the Route through the County of Ontario, and its advantages, as compared with other proposed routes ; consequently, MR. KEEFER, the Engineer employed by the Chairman of the Committee has not entered into calculations, or figures of cost in his report.

R E P O R T .

*To S. B. FAIRBANKS, Esq., Oshawa ; Chairman
of the Standing Committee on Roads and Bridges,
County Council, of the County of Ontario.*

SIR :

I have the honor to report that, in compliance with your instructions, I have examined the country between the Townships of Whitby and Thorah, in the County of Ontario, as well as the valleys of the Scugog, Sturgeon, and Balsam, Lakes, and the Talbot Portage route, in order to determine the practicability of constructing a Canal between Lake Simcoe, and Lake Ontario, by the route of Lake Scugog.

The practicability of connecting Lake Simcoe, with Lake Huron, is assumed :—and I have no reason to doubt that this may be done, either by the natural route, of the Severn river or by the Nottawasaga,—so that if Lake Simcoe, can be connected with Lake Ontario *via* Scugog, a route for a Georgian Bay Canal may be had, which will be as direct as any other, and at the same time be in communication with the Inland waters—or the Trent Navigation.

The renewed importance which has been given to a Georgian Bay Canal, since the diversion of Western trade from the Mississippi to the great Lakes, has induced your County Authorities to undertake this examination, in order to bring forward the merits of the Scugog-route, in competition with the

only one hitherto agitated, that by the valleys of the Holland and Humber rivers—west of Toronto.

Before proceeding to give the result of my examination, I will refer to the question of a canal between Lakes Huron and Ontario, generally in order to shew, that the two routes above mentioned, are the only direct ones, which offer any inducements for consideration.

The object sought by the Georgian Bay Canal in contradistinction to the Welland route, *via* Lake Erie, on the one hand, and the Ottawa route, *via* Lake Nipissing on the other, is to afford a navigation which shall avoid the *detour*, and extra Insurance of Lakes Erie and St. Clair,—the Detroit and St. Clair Rivers, and especially the shoals known as the “St. Clair flats;” and at the same time give a route, not only to Montreal—but from Chicago to New-York, *via Oswego*, which the Ottawa route could not do. The height and breadth of the dividing ridges between Huron and Ontario, make it impracticable to use the waters of the former as a feeder and thus obtain the minimum lockage, as is the case between Erie and Ontario, on the route of the Welland Canal;—a higher intermediate level must therefore be resorted to but there is a shortening of the route, between Chicago, and Oswego of 250 miles, to be—set off against the increased lockage required on the Georgian Bay route.

The range within which a canal route between Huron and Ontario can be sought for, is limited to the valley of Lake Simcoe, which is common to every route: and, as already mention-

ed, this Lake may be entered from Lake Huron, either from the mouth of the Nottawasaga, or Severn rivers : but the range by which communication between Lake Simcoe and Lake Ontario is possible is much wider, extending from the Humber Valley, west of Toronto, to the mouth of the Trent in the Bay of Quinte.

As the extreme Eastern outlet, (altho) the natural one, embraces a length of Navigation of over 200 miles between Huron and Ontario, in addition to the maximum lockage, it cannot come into competition with either of the other routes in point of distance, and the question then arises whether the difficulties in overcoming the natural barriers between Simcoe and Ontario on any direct route, would force a resort to the circuitous one of the inland waters.

To this it may be said that there is evidently a limit within which the route of a Georgian Bay Canal may be lengthened, because, with the inevitable excess of lockage, a direct route is the only one which could, on commercial grounds alone, be advocated in competition with the enlargement of the Welland Canal ; a canal which has the advantage not only of the minimum lockage and cost, but also of accommodating the trade of Lake Erie, as well as that of Huron, Michigan, and Superior.

In a military point of view there would be an advantage in favor of a Georgian Bay route, (besides the local benefits conferred) over any enlargement of the Welland, or of a second canal on that route : and if the St. Clair Flats may be regarded as a permanent obstacle to navigation, the commercial super-

iority of such a route for the trade of Huron, Michigan, and Superior, would be very decided. As a mere military work, the extreme Eastern route already mentioned, by the Trent and Bay of Quinte, might be preferred ; but if commercial considerations prevail the question of route will be limited to the township of York and Whitby. In these comparisons the question of cost is omitted, the surveys which have been made not having been carried far enough to give the data for arriving at the probable cost upon any of the routes, although enough is known to shew that any direct navigation between the Georgian Bay and Ontario must be a costly undertaking in proportion to its length.

The old surveyed route, *via* the Trent and Bay Quinte, would evade the formidable ridges South of Lake Simcoe, but, from the extent of shoal water and rock which would be encountered upon the route, the cost for a deep water navigation, such as is now demanded by the exigencies of the through commerce would probably be as great a total, (though not so great per mile), as upon the shorter routes.

With the preliminary remarks, I will now describe the natural obstacles to direct navigation between Lake Simcoe and Ontario, to follow which it is necessary to bear in mind that Lake Huron is 340 and Lake Simcoe 475 feet above the level Ontario.

The peninsula of Eastern Canada, from the banks of the Niagara river, the natural outlet for the waters of the Upper Lakes, rises gradually from an elevation of about 360 feet,

above Ontario at the Great Western Railway near the Suspension Bridge, to 550 feet, on the line of the Hamilton and Port Dover Railway, and 750 feet on that of the Great Western, between Hamilton and the Grand River—where the high lands sweeping round to the North East, an elevation of over 1000 feet, above Ontario, is encountered at the summit of the Grand Trunk Railway in Esquesing, between Toronto and Guelph.—Here the elevated plateau bears off nearly due North, running into Lake Huron, above Collingwood, with a precipitous escarpment on the Eastern face—a fall of between 300 and 400 feet taking place rapidly in that direction. From the face of this escarpment a lower ridge (at about the general level of 700 feet above Ontario,) sets out from a point about midway between the head of Lake Ontario and Lake Huron, having its summit, north of Toronto, at a point half-way between Ontario and Simcoe, but approaching the former as it proceeds Eastward until it reaches the Township of Whithy where the summit, which had set out in Caledon the 3rd Township back from Lake Ontario, enters the N. E. corner of Whitby, a Township fronting on that Lake. Before reaching this point however the ridge attains its highest elevation (about 900 feet) in Uxbridge from whence a broad “spur” strikes out to the North East, the angle between the main line and spur being occupied by Lake Scugog. This Spur, separating Scugog valley from that of Lake Simcoe, extends at a very, uniform elevation, (with one remarkable break,) up to Balsam Lake, where it falls off. The main line of the ridge between Scugog and Ontario has a summit of about 800 feet above On-

tario, but here the ridge attains its narrowest dimensions, being "drawn up" as it were—the breadth on the top being from 200 to 300 yards. At a level one hundred feet below the summit the breadth through, is less than half a mile. The spur between Scugog and Simcoe valleys has a tolerably uniform summit of 750 feet above Ontario, but it has great breadth—the high ground approaching near to Lake Simcoe and Scugog. The spur is nearly cut through, on a direct line between Beaverton on Lake Simcoe, and Port Perry on Lake Scugog, by the valleys of the Beaver and Nonquon streams, on which route a narrow ridge; giving a summit of about 650 feet above Ontario, is found, which extends only half a mile, after which this is reduced to 630 and under.

Scugog Lake stands about 575 feet above Lake Ontario, so that the highest ground between it and Simcoe would be about 75 feet above the level of the former—while the extreme summit of the ridge between it and Ontario would be 212 feet above Scugog Lake, on the lowest—but 234 feet on the shortest route. The hilly country between Scugog and Simcoe—the difficulty of following the timbered and swampy valleys, and the circuit required by reason of so many road allowances being closed—make repeated levelling necessary to ensure exactness. I think, however, the above figures will not be seriously altered by a more careful survey.

SUPPLY OF WATER.

The first question which presents itself in projecting a Canal

between Simcoe and Ontario, *via* Scugog, is a supply of water.

Scugog Lake could not be depended upon for this purpose, and a supply either independent of it, or auxiliary to it must be sought. This can only be obtained from that portion of the Trent waters which lie above the Scugog level. If Lake Scugog be made the feeder, an auxiliary supply must be thrown into it; and this can only be done either by bringing Sturgeon Lake to the same level with Scugog, (abolishing the dam at Lindsay), and sending a portion of the waters which pass Bobcaygeon Dam, to Port Perry; or by bringing down a feeder from Cameron's Lake, and throwing it into the Scugog, *above the Dam* at Lindsay.

To effect this it is probable that it would be found advisable to lower Scugog Lake, say one-third, and raise Sturgeon Lake two-thirds of the difference between them. But in order to make Scugog a feeder—it would be desirable, in view of the Summit to be overcome between it and Simcoe and Ontario to raise rather than lower its level—as every foot which could be put upon it would seriously diminish the cost of the Summit cuttings.

It is impossible without a careful survey to express any opinion as to the effect of raising Scugog Lake above its present level any definite number of feet. If it be raised at all, or even maintained upon its present level, it would be necessary, as there is no probability that Sturgeon Lake could in that case be brought to the same level with it, to resort to the more

expensive plan of bringing down a feeder from Cameron's Lake. There would be the disadvantage that as Cameron's Lake is over fifteen feet higher than Scugog Lake, the whole benefit which could be derived from such an expensive feeder would not be obtained unless Scugog Lake could be raised ten feet or more—a proposition, I take it, which could not be entertained.

In view of the formidable character of the cutting between Scugog and Ontario, and the great length of the summit one between Scugog and Simcoe, it would very much diminish the difficulty and cost of these, which are the keys to the undertaking, if a feeder, at least as much higher than Scugog as the depth of the proposed navigation, could be procured,—by which these Cuttings could be reduced in length and depth, and thorough drainage in both directions be secured. Moreover, it would be desirable that the scheme should be carried out without affecting the physical features of the country to the extent which would be done by serious alterations in the level of Sturgeon and Scugog Lakes.

The plan which therefore appears to me the most feasible, would be, to make Balsam Lake or Gull River, the feeder, the waters of which could be had at an elevation of nearly 600 feet above Ontario, and to throw a sufficient quantity of these into the Talbot River and conduct them by a feeder towards Cannington, in Brock, near which it would strike the line of the proposed navigation. With a feeder, at a level say 15 feet above Scugog, the length of the cutting between Scugog and Simcoe would be still a long one, say nine miles, averaging

25 feet, with the exception of the half mile of summit—where the cutting would reach 70 feet. If Gull river can be tapped above the level of Balsam Lake, the height of the ridge or spur, before described, between the East Branch of the Beaver Creek, and the head water of Talbot River, is such that it should carry a feeder on a higher level than Balsam Lake, and thus attain a greater command of the ridge between Simcoe and Scugog. Of course every foot added to the height of feeder, would add two to the lockage of the route, but, within certain limits, this would be preferable to long deep cuttings in the bottom of valleys which have high banks, or in swamps.

With respect to the supply of water which could be afforded from Gull River, or Balsam Lake, I am of opinion that it could be materially increased by impounding the flood waters in the Lakes which are the sources of this stream, nor do I doubt that a survey would shew a further supply could be added by diverting the waters from the sources of such streams as the Muskoka, Madawaska, Pettewawa, or Burnt River, or some of these. I have generally found that the chains of Lakes which occupy the “height of land,” are divided often by low and narrow barriers, and that water may be turned from the higher into the lower without serious difficulty.

If the feeder be maintained on a level above the Scugog Lake, the Canal need not enter this Lake at all, (except by locks for the purpose of branch navigation,) unless the Lake were raised to the level of the Canal by a dam at its outlet, which would not probably be entertained. Instead of this the

Nonquon Valley might be dammed across at the junction of the North and South branches on the 13th line of Reach, and the Canal be continued in the South Branch Valley as far as the 10th concession, when it could be taken out to the shore of Scugog Lake, and thence by the valley of Cedar Creek, to the Pine Ridges.

No steps were taken to ascertain the character of the summit cutting between Scugog and Simcoe, in the Nonquon and Beaver Creek Valleys, and intervening ridge, but, as I believe no rock has been discovered in Brock or Reach, it may be assumed to be earth excavation. As to the more lofty elevation, southward of Scugog, it would be difficult to surmise what might be found at the bottom of an excavation of 200 feet, and over, in its deepest portion, and several miles in extent. As shewn on the top, the ridge is a hard clay, overlaid in some places with sand. It may be that the core of the ridge is rock which material is found near the Ontario level at Port Hope and Toronto, and again at Lindsay on the Scugog River.

In a cutting of such depth, and in a district devoid of stone, rock would be the most desirable material to encounter, as it would be a guarantee against slides, and give the minimum quantity to be removed; while, if of a useful quality, its value to the work would be considerable.

If the Severn route were adopted between Lake Simcoe and Lake Huron, the Georgian Bay Canal route, via Scugog, would be between 5 and 10 miles shorter than the one via the Humber and Holland Rivers; but if the Nottawasaga route be taken be-

tween Simcoe and Huron, there would be about the same difference the other way.

If the Severn route be found preferable, it would not be necessary to enter Lake Simcoe at all; and this may then prove the better course. It would be better for the Canal if it had a continuous towing path (like the Welland) from Huron to Ontario, as both these Lakes are well adapted for sailing craft. Since the feeder will leave the Talbot River valley, it may be found practicable to continue upon it, as the main line of Canal, and descend from thence to Lake Couchiching or Severn bridge, --or the Canal may keep above the Lake level, from the shore near Beaverton, to the same points, and thus avoid the cost of a harbor, dredging, towage, &c., which are involved by entering the Lake.

LOCKAGE.

The total lockage on this route would be very heavy, amounting to 840 feet, or about 500 feet greater than that upon the Welland Canal. The lockage upon the Holland and Humber Rivers route, with Lake Simcoe as the feeder, would be 230 feet less than this, as that Lake is 100 feet lower than Scugog, and 115 feet lower than the proposed summit or feeder level of a Canal through the County of Ontario; but the obstacles are so great to any route with a feeder so low as Lake Simcoe, that I am of opinion the extra lockage would be preferred to attempting the long deep cutting between the Holland and Humber Rivers. I have shewn a section of ridge compared with

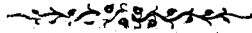
the one South of Scugog Lake, by which the difference in the two undertakings will be perceived at a glance.

I have the honor to be,

Sir, your obedient servant,

THOS. C. KEEFER.

Ottawa, September 3, 1863.





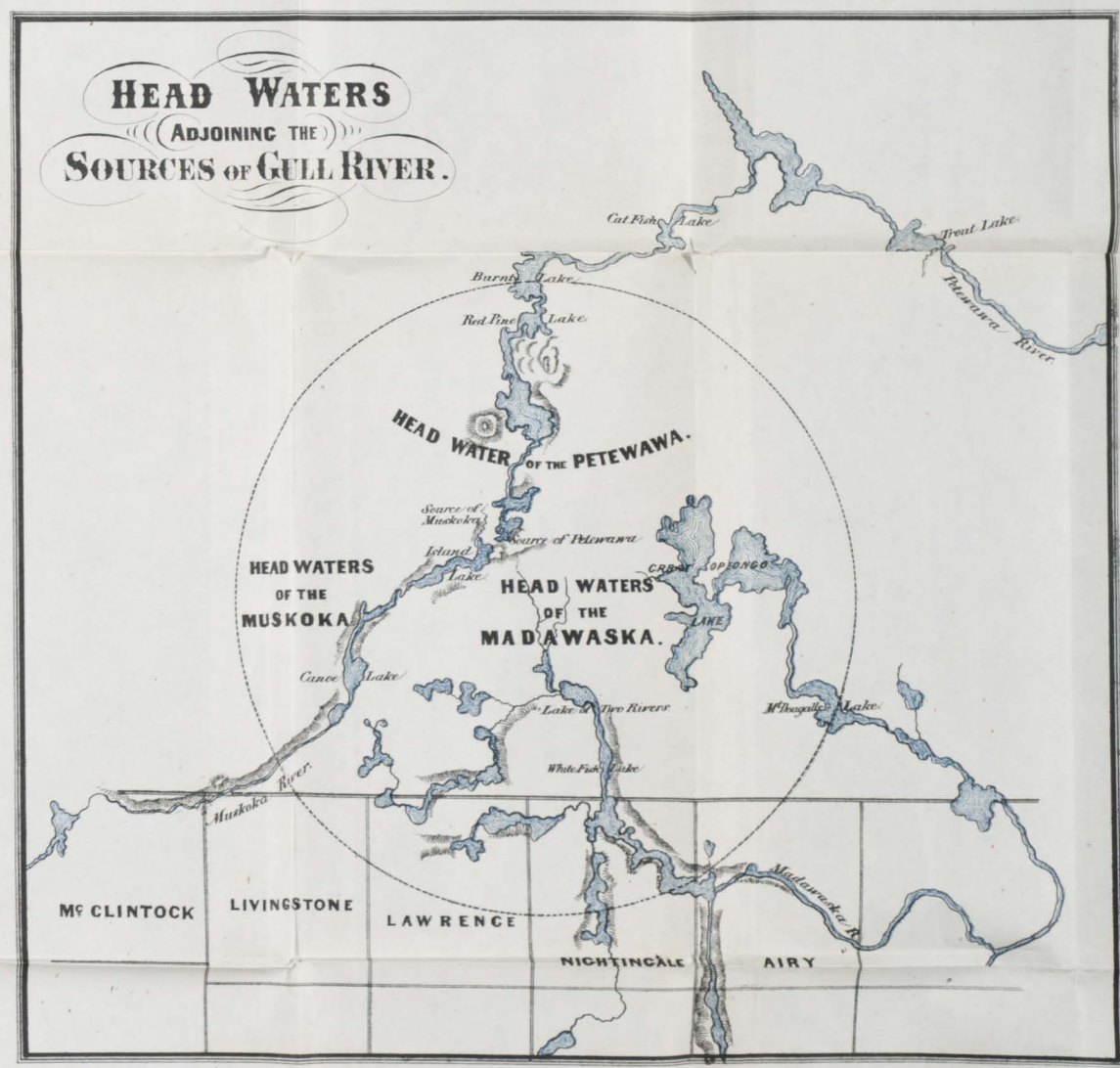
PLAN OF SURVEY
FOR
GEORGIAN BAY CANAL
THROUGH THE
DIVIDING RIDGES
(OF THE)
COUNTY OF ONTARIO

TO ACCOMPANY REPORT OF SEPTEMBER 3rd 1863.

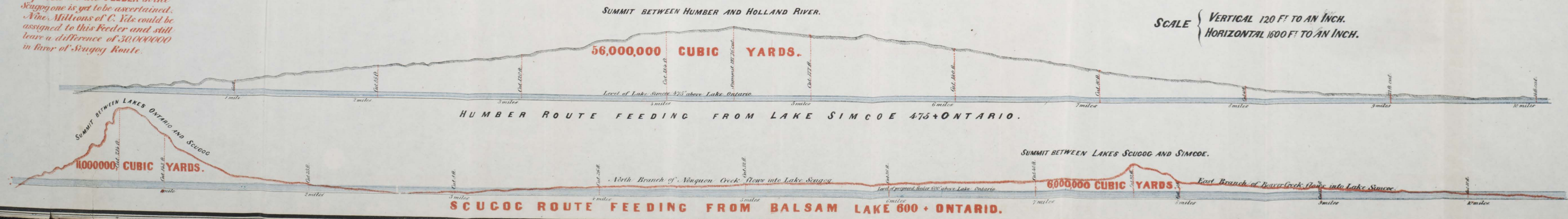
W. C. Keefe

W. C. Keefe & Co. Ltd. Toronto C.B.

SCALE, 5 MILES TO AN INCH.



COMPARISON OF THE SUMMIT CUTTINGS IN THE HUMBER AND SCUGOG ROUTES.



To compare the whole EXCAVATION on the two routes, the amount required for the FEEDER in the Scugogone is yet to be ascertained. Nine Millions of C. Yds. could be assigned to this Feeder and still leave a difference of 30,000,000 in favor of Scugog Route.