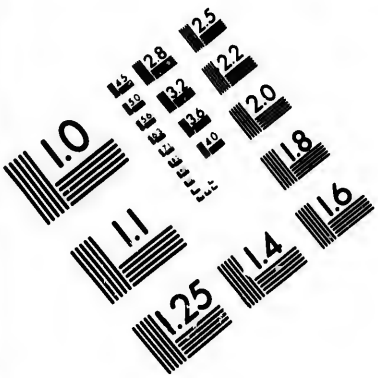

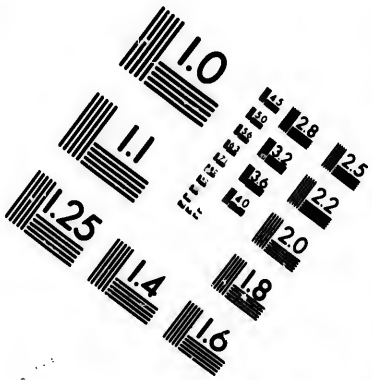

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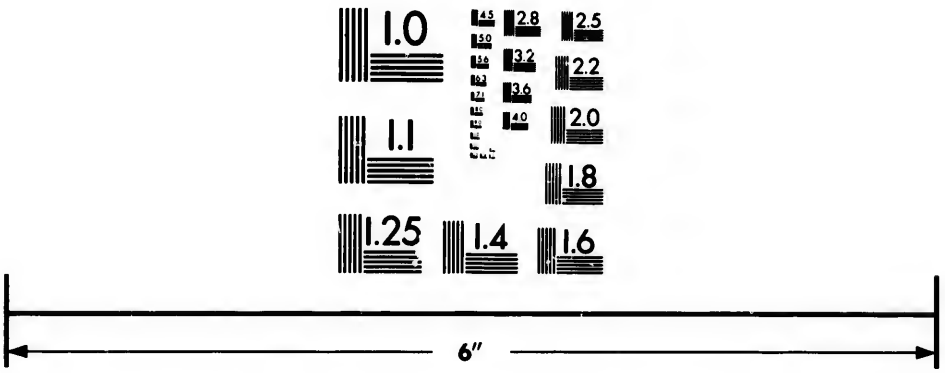

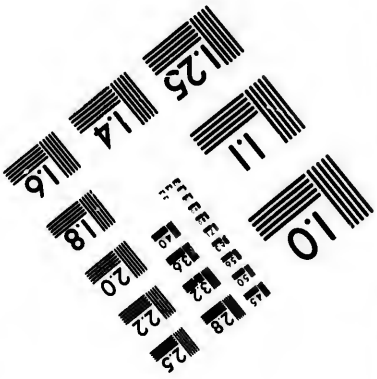

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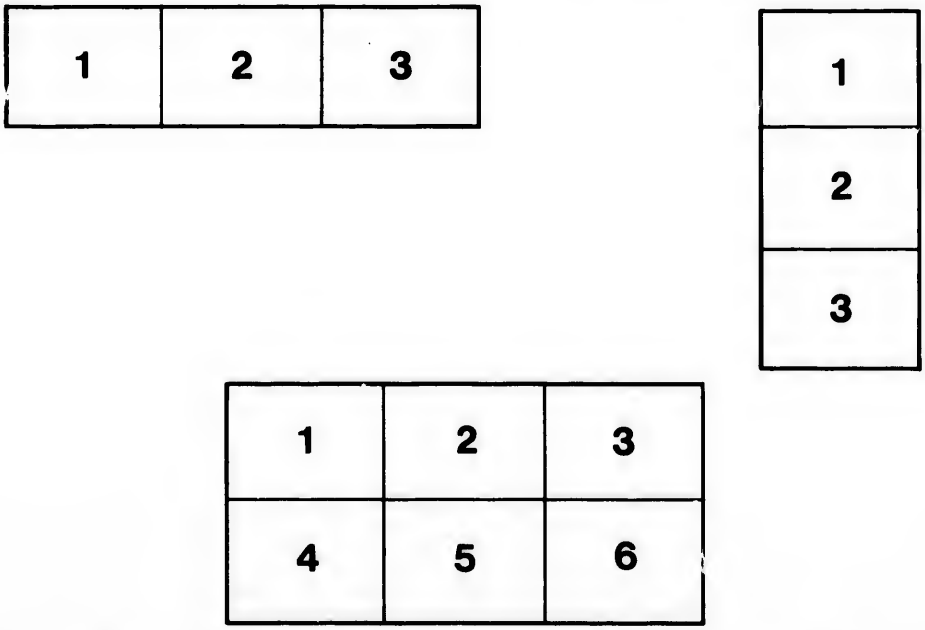

REPORT

ON

THE MOST ELIGIBLE ROUTE FOR A CANAL

BETWEEN

LAKE SIMCOE AND THE RICE LAKE,

And on the Practicability and Expense of connecting these waters—by order of His Excellency Sir John Colborne, K. C. B., &c.

By R. N. BAIRD, Civil Engineer, M. I. C. E. L.

REPORT.

To His Excellency Sir John Colborne, K. C. B., *Lieutenant Governor of the Province of Upper Canada, and Major General Commanding His Majesty's Forces, &c., &c., &c., on the most eligible route for a Canal between Lake Simcoe and Rice Lake, and on the practicability and probable expense of connecting these Lakes.*

By N. H. BAIRD,
Civil Engineer,
& M. I. C. E. L.

May it Please Your Excellency,

That in accordance with your Excellency's commands, conveyed to me in Lieutenant Colonel Rowan's communications of the 29th May and 16th June last, and in the spirit of the particular instructions conveyed in the latter, in conformity with the address of the House of Assembly of date 16th April last, viz: —"To examine the most eligible route for a Canal between Lake Simcoe and the Rice Lake, by a series of "running levels, and to report to your Excellency, for the information of the House at its next Session, re-"specting the practicability and expense of connecting these Lakes."

I have, in consequence, the honor to state for your Excellency's information, that upon the 18th day of June last, having completed my preliminary arrangements, in providing proper assistance and canoes, in which I found more difficulty than I anticipated, and having engaged the services of Mr. F. P. Rubidge, Deputy Provincial Surveyor, for the surveying department, I proceeded to the inspection and examination of the country between Rice Lake and Lake Simcoe, conceiving it more in order to follow up the route from the Bay of Quinte, as detailed in my former report to your Excellency on the proposed improvements on the River Trent, in 1833, than to reverse, and commence from Lake Simcoe—the result of which inspection, levels, survey, &c., I shall endeavour, with as much perspicuity and brevity as the nature of the important subject will admit, to lay before your Excellency, assuming, although not expressed in my instructions, or in the Address from the House, the same scale of navigation as that reported on for the improvement of the Trent, viz.. for locks 134 x 33 x 5 feet water as the data upon which to proceed; accordingly commencing from Rice Lake, into which the navigation must be understood as made available by the requisite operations formerly reported and estimated, and for perspicuity and reference sake shall divide the whole route into five sections, commencing from the Rice Lake, thus:—

Section 1st.	From	Rice Lake to Peterborough	$21\frac{22}{80}$
" 2nd.	"	Peterborough to outlet of Clear Lake	$14\frac{34}{80}$
" 3rd.	"	Outlet of Clear Lake to Bobcaygeon lock and rapids	$31\frac{40}{80}$
" 4th.	"	Bobcaygeon to Balsam Lake Portage	$26\frac{24}{80}$
" 5th.	"	Balsam Lake to Lake Simcoe	$16\frac{40}{80}$
		Making in all	110 miles.

With reference to section No. 1, the first obstacle presenting itself is the bar at the outlet of the Otonabee River, over which, in some seasons, at lowest summer water, there is not more than eighteen inches; from this point of difficulty to within half a mile of Peterboro', or at Whitlaw's Rapids, a distance of 21 miles, the river presents a fine available stream for moderate sized steamers, with the exception of three trifling obstructions, as shown in the accompanying plan and section, viz.: Danger Field, Robinson's Island, and Yankee Bonnet Shoals, over which, at lowest summer water, 18 inches will be the utmost, and would not ever have reached that but for the exertions made last summer, or summer before, in removing the round boulders from the channel, and placing them in heaps or piles, out of the fair way, by a grant (I understand) from the Provincial Parliament, laid out under commissioners appointed for the purpose, and which in so far as such partial improvements go, appears to have been a benefit to the navigation. The next obstruction, in rotation, is the Whitlaw's Rapids, a pitch of about 2 feet 9 inches (2—9); at this point considerable expense has been incurred, in clearing the bottom from boulders and in forming buttresses therewith to contract and deepen the bed of the river, and which seems to have so far succeeded; but at the same time, the benefit seems to have been counteracted on the other hand by the increase of current, which, as a matter of course, the contracting the channel has had the effect of creating, although not so great as to prevent the steamer *Northumberland*, a twin boat of particular construction, and drawing very little water (say 2—6), laid on that route by individual enterprise, to surmount at a moderate pitch of water, when she readily gains the extent of the navigation of the Otonabee River in its present state, in the basin immediately below the town, and at the foot of the 9 mile rapids, having surmounted with ease a small ripple of a few inches difference of level at the narrows between the Little Lake and upper bay. Thus terminating the first section of difficulties on the route, viz; the bar at the mouth of the river, Danger Field, Robinson's and Yankee Bonnet Shoals, with Whitlaw's rapid, and small rapid above, making in all, from Rice Lake to Peterboro', a difference of level of 4 feet 6 inches.

The next and more serious obstruction to the navigation of the Otonabee River, presents itself prominently in a series of uninterrupted rapids and chutes from Peterboro' Bay to above Herriot's mill, in Douro, and into the now dead water of Katchiwannoe Lake, a distance of 9½ miles, and rising no less than 147—6 feet odds, on which portion of section 2nd are situated, above Peterboro' bridge, Halls' mills, built for the use of the settlement by Government some years ago, taking the water from the river above the mill by a very long aqueduct, and by the construction of a dam across the river, as shown upon the accompanying detailed plans, having a head and fall of 12—7 8-10 feet. This dam has the effect of sending the water as far back as point A on the plan—from thence to the tail water of Stevenson's saw mill, the river preserves its general character of rapids and swift water, and generally deep, say from 3 to 4 feet; above this point is situated Mr. Stevenson's mill dam, of rude construction, but it is presumed sufficient for all the purposes required, making a head and fall of 2—7 feet, and throwing the water as far back as point B on the plan—from which to the next artificial obstruction to the river, the same characteristic of rapid and chute prevails, until reaching Lee's mill-dam and works, at which place a dam, on somewhat more substantial form and principle of construction, affords a command of 13—1 2-10 feet of head and fall, and backs the water, with the exception of a slight current, as far as point C, at the foot of Mr. Reid's clearance; from the mill pond, it is worthy of remark, that the water has been conducted scientifically by the late Mr. Lees along an expensive and well constructed canal to his mill, as shown on the plan, and being somewhat through rock, must have cost a considerable amount—this work will be more particularly referred to when treating of the improvement.

From point C. on the plan, or from the head of Lee's mill pond, the river presents one continued series of rapids and chutes until reaching the dead water of Katchiwannoe Lake. The general character of the banks, high and rocky, and well bedded, affording excellent materials for lockage, &c., being of a good compact limestone.

From the detailed plan accompanying, from actual survey, a more correct idea may be formed of the general character of the river than any attempt at description could convey, while at the same time the longitudinal section shews the continued rise, with the general depths of water, as found at the time of inspection.

From the foot of Herriot's rapids (on which an excellent saw mill is in operation, and a grist mill in progress of being erected) 8 feet—10—3 of rise carries into the mill pond dead water, upheld at that level, say 142 ft —3—5 above Peterboro' Bay, by a short substantial dam, as shewn on the plan and section, and backing the water over the former rapids into Katchiwannoe Lake, at the lower extremity of which a shoal presents itself, an obstruction to the requisite navigable qualities, but of short duration. Next in order, and the only obstruction to the navigation on the 2nd section, is the rapids at and opposite Young's house and mill, and the artificial obstruction of a dam thrown roughly across the river by Mr. Young, for the use of a very complete common principled grist mill, made to drive two runs of stones, with a total head and fall of only 3 feet, and during the particular period of my inspection, had only 24 inches, and affords an instance of what *properly* applied power may produce, with a due regard to economy of water. By the accompanying plan it will be seen the enterprising proprietor has spared no pains in the construction of an aqueduct, &c., through a stony stratum to gain his end; as to the expediency or propriety of his throwing a dam across the river at the particular spot he has, will afterwards be considered in this report, although it would appear to have materially benefitted the navigation into the outlet of Clear Lake, by drowning the rapids thereon and giving sufficiency of water over them, thus terminating the second general section of the route.

The next portion (forming the 3rd section) extends from Young's rapids to Bobcaygeon, a distance of 31½ miles, rising 38—4 feet, and taking in its course Clear and Stony Lakes, Peninsula Falls, Deer Bay, and Burleigh chutes, and Buckhorn's rapids or Hall's mill, with the navigation of Buckhorn and Pigeon Lakes, with their shallows, &c.

Then to resume at Young's mill rapid, the navigation, in consequence of the dam already constructed, is complete, with the exception of 3 in place of five feet water on the outlet of Clear Lake, until reaching the Peninsula Falls, through the rather intricate navigation of Clear Lake, among its rocky islands and sunken rocks, and along the splendid navigation of Stoney Lake, until reaching the head thereof, in the spacious basin

into which the Falls disgorge themselves with boisterous rapidity from the several ragged and iron bound outlets. To surmount the obstacle at this point (rise 25—8 3-10) seemed at first, and even on mature reflection and inspection, to be a work of somewhat of a serious nature, from the particular quality of the obstructions in the several openings and outlets and ravines of which the mass of adamant obstruction is composed, when after much search, a small channel, emitting the least quantity of water of the whole, afforded an opportunity of carrying the navigation over an ascent of 25—8—3, and into the water connecting with Deer Bay, and at which point the dreaded iron-bound nature of the rock turned out to be the finest *workable* granite—the only instance of the real granite, in any quantity, which has come within my observation in either of the Provinces, with the exception of Buckhorn rapids, where it also exists; by the general plan the position of the lockage can be seen—conceiving it unnecessary, so long as I had a correct section of the ravine, to have a detailed plan of the whole, particularly as such could not be properly done till Winter, from the very intricate and insulated nature of the several islands, bluff points, &c. Having gained the waters of the bay above, the next obstruction occurs at the outlet of Deer Bay, as shown on the plan, where a rise of 2—2 6-10 presents itself in a smart wicked chute or jump, in a short distance, but affords an excellent opportunity for improvement in the well-protected bay below, and advantageous ravine and low ground adjoining. Having overcome this obstacle, a small chute again interrupts the navigation, of 18 inches, as shewn on the longitudinal sections of the route, until reaching Buckhorn rapids, on which are situated Hall's mills, (and which point forms a particular feature in the line of communication, as commanding and regulating the whole surfaces of Buckhorn, Chemong, and Pigeon Lakes, up to Bobcaygeon, 15½ miles,) at which place a difference of level occurs of 8—2 6-10, to be overcome, as afterwards described—and carry the navigation to Bobcaygeon rapids and locks, thus terminating the 3rd sectional division of the route, from which to Balsam Lake portage, a distance of 20¼ miles, and rising 34 feet, the 4th section extends, comprehending the rapids and works at Bobcaygeon, the shallows from thence to Sturgeon Lake, the works at Cameron's Falls and Balsam Rapids, and which present the following obstructions, namely—at Bobcaygeon a rise of 5 ft. 5 in. 4 pts. and a continuation of rapid of considerable extent, together with shallows, until reaching the outlet of Sturgeon Lake, and which has been attempted to be surmounted by the construction of a lock and a dam at considerable expense, by a Provincial grant, but which has not as yet been available, by some unaccountable oversight in three circumstances, from the *level* of the lower sill being equal to that of the lowest water in Pigeon Lake, in place of being the requisite canal water depth below the same, say 3 feet for these purposes—from the dams above not being sufficient to retain a sufficient head of water over the shallows above, and lastly, from the loose and open nature of the cut from the above to the lock, not retaining the water for want of proper means being used in the construction, allowing the water to escape in the many crevices and open chasms which the nature of the ground presents, thereby rendering the works at this place entirely useless, without an adequate outlay to remedy the evil.

The next and most serious obstruction to the navigation on this section occurs at Cameron's Falls up to which point, after overcoming the difficulties at and above Bobcaygeon, a most excellent line of navigation, in the deep waters of Sturgeon Lake presents itself, when a rise of 24—10 2-10 occurs, from the waters of the deep navigable inlet from Sturgeon Lake to the foot of Cameron's Falls, into the still water of Cameron's Lake, rendering the adoption of two locks and guard lock at a most convenient site, as shewn on the plan, necessary. None who have ever witnessed the scenery of Niagara Falls but must at once have the impression forced on their minds of a resemblance in miniature, in Cameron's Falls—the approach from Sturgeon Lake, between the high rocky banks, in their perpendicular grandeur, until instantaneously the Fall presents itself in the same horseshoe form, with a curtain similarly arranged, affording behind it from one shore to the other, a promenade. A commencement has been made by the enterprising proprietor, on an extensive scale, indicative of the rise and progress of a place of importance, and which, doubtless, its central situation must insure; in addition to a saw-mill, preparations are making for the erection of a grist and other mills. An inn of unusual extent and accommodation for a new country, has just been completed, together with the proprietor's own and several other houses, store, &c, forms quite a village in a wilderness.

Leaving Cameron's Falls, the route continues somewhat shallow up the river, (until reaching Cameron's Lake, which is in general very deep,) but which, by the operations at Cameron's Falls, will readily be overcome, and thus carry the navigation over the shallows, foot of the Balsam Rapids, opposite the head of the Fork Island, and at which place the rapids may be *said* to commence, and although rising only 2 ft. 8 in. into Balsam Lake, present a very protracted and serious interruption, (compared to what the first impression did import,) as shown in the detailed plan and section accompanying, and this accomplished, carries the navigation into Balsam Lake, 227 2-10 ft. above the Rice Lake, and the summit level of the communication from the Bay of Quinte to Lakes Simcoe and Huron, 592 ft. above the Bay of Quinte, and 118 ft. 6 in. above Lake Simcoe. The surface of Balsam Lake I purpose holding permanently near high water mark, for the purpose of giving sufficient water over the bar at the outlet of the Lake, head of Balsam rapids, as also to afford better access to the shore at the Portage, or the point where the cut of junction with the Talbot is intended to leave, besides saving many thousand pounds in excavation—thus terminating the 4th section, and commencing the 5th and last to Lake Simcoe—descending 118 ft. 5 3-10 in. in a total distance to the Lake of 16½ miles, or to the point of junction with the Talbot, discharging itself into Lake Simcoe, 13¾ miles.

In attempting a description of the obstructions on the section, I may commence by remarking generally that they are two-fold:—in the Talbot River, on the one hand, in its course holding out one line for consideration, in contra-distinction to carrying a continuous navigation over a most favourable country of 13¾ miles, until intersecting the Talbot River in its more developed character for navigation, within 2¼ miles of Lake Simcoe, and in either affording sufficient scope for the duties of the Engineer.

The Talbot River in its southern branch, taking its rise in a swamp to the west of Balsam Lake, continues winding in a very narrow and serpentine course for about 3 miles, until reaching the Forks or junction with the north branch, at which point the river assumes a respectable navigable appearance for batteaux, and continues so, but in a very serpentine course, until reaching the Long Portage and head of the Lost Channel, and continuation of Dry-bedded River, where the water finds its way under ground, and makes out "to day"

again at about a mile below, from which the river continues as formerly described until reaching the Crooked or Wicked Rapids, of about half a mile in extent, along which we had great difficulty to float the canoes, with the baggage and provisions out, which brings the river into what may be called the commencement of the navigable portion, having at this point, by three successive rapids, descended about 55 ft. From this point to the Summer Portage, on the plains, or near the head of the next rapids and flood wood interruptions, the river preserves a navigable character, being from 70 to 100 ft. in width, and from 4 to 5 ft. in depth, with the exception of a small interruption, about 4½ miles from the Portage, of rocks and gravel in form of a shoal and rapid, which might easily be overcome.

From this point (the Summer Portage) the rapids commence, and continue, interspersed with short stretches of still water and jambs of floodwood, until reaching the termination of anything like serious interruption at point T. on the plan, from which, downwards, may be reckoned the really available portion of the Talbot River for improvement, and which, from the detailed plan accompanying, made out from actual survey, at much inconvenience to the party, will appear to be of a nature somewhat doubtful in its present state—the *radii* of the survey being such as to render the ready navigation by the description of craft intended to be used on this inland communication at least difficult, although the elbows may be materially relieved of their acuteness, from which point until reaching Lake Simcoe no material difficulty occurs, with the exception of flood wood, but what lockage will easily overcome.

Having reached the mouths of the river along 8, 10, 18, and 20 ft. water for the last 3 or 4 miles, as shewn in the plan, the progress into the lake is impeded by the existence of a gravelly and sandy bar of considerable extent into the lake, as per plan and section, affording at low water not more than 2 ft. 6 in. in the fair way, but which can be removed and permanently secured against filling up by the construction of piers properly thrown out.

Of the capabilities of the Talbot, from its confluence with Lake Simcoe to the commencement of the rapids, there can be but an opinion, although that is in some degree shackled from the very circuitous nature of its course, making, for instance, a distance by following the river, of 30 miles to Balsam Lake, whereas by a direct line from the present Indian Landing, or rather from a more convenient basin one-eight of a mile above, the distance would be reduced to 16½ miles, thereby not only avoiding many inconvenient turns, as shewn in the plan, but shortening the distance greatly, say 3½ miles.

Having thus endeavored to lay before your Excellency the difficulties and obstructions to be overcome, in order to render what I conceive, after mature deliberation, the most eligible route for a water communication available to connect Lake Simcoe with Rice Lake; I shall, in order as they occur, suggest such operations as I consider will be required to accomplish the end in view.

But prior to entering into the details of the route proposed for adoption, it may not be out of place to remark, that in gaining the extremity of the 1st or lower section, viz.: Peterboro' Bay, the attention was naturally called to look around for an outlet — appearances indicating that the navigable qualities at that point ceased. When my attention was naturally drawn towards the ultimate object of my search—the direction of the head waters — Chemong or Mud Lake naturally attracted attention, however forbidding its appearance in the present state at low water, through which a canoe can be paddled but with difficulty, and the general report as to its inadequacy to anything like navigable purposes, nevertheless, I resolved on a trial, and steering my course in that direction, following a natural ravine and apparently low ground, leaving the bay at the convenient basin, as shewn on the plan, and passing through chiefly the unlocated town lots of Peterboro'—crossing the communication road at Mr. Dixon's gate, and thence bending northward in easy curvature through convenient ground, until reaching by easy ascent the height of land between Peterboro' and Chemong Lake, in the shortest feasible route between the two waters which afterwards, contrary to my expectation, on applying the level, I found not to exceed 50 feet above Chemong Lake, thereby offering a *probability* of the internal or cross-the-country line, being worthy of attention; still as the Otonabee, it its circuit, had to form the criterion of competition, I resolved not to abandon it without an examination, particularly as the land route did not hold out any very flattering inducements to at once adopt it; however, when on the ground, and as the country afforded an excellent opportunity of ascertaining the gross difference of level, and at the same time afforded data for a sectional view of the country for whatever purposes its capabilities afterwards might be deemed susceptible, I instituted a set of levels across from Chemong or Mud Lake to Peterboro' Bay, and I found I had the quantity of 189 ft. of difference of level or lockage to contend with, and of course to be encountered, in the several obstructions of the Otonabee, in its elbow course, a difference of level which somewhat staggered my confidence, being lead to believe that the difference (of level) was inconsiderable, as stated in my report on the Trent: but having soon thereafter an opportunity of proving those levels by a series from Chemong Lake, down through Buckhorn and Peninsula Falls, and down the long rapids of the Otonabee to Peterboro', putting the matter beyond all doubt, which led to the idea (taking into account the probability of a proportionate increase on the several remaining sections of the route from the original conjectures on the subject) of addressing the Interim Report, which I had the honor of handing your Excellency personally, and thereon receiving your Excellency's further instructions, which the importance and consideration of the subject required.

I would further remark, that in consequence of the tenor of my instructions, and from circumstances occurring since the issuing of the address, and in obedience to your Excellency's commands, originating from such circumstances, viz.—"The reputed eligibility of a route existing to connect these waters by way of Stoney "Lake, with Belmont, Ball, and Crow Lakes, and thence with the Rideau Canal head waters on the Crow "River,"—

In consequence, and with the view of leaving no room to doubt as to the most eligible, I inspected the reputed route, in a most arduous and unsatisfactory exploration of that country, in its iron bound coasts and islands, continued rapids and vexatious portages, over hill and dale--occupying myself and part of my hands nine days, serving only fully to establish the impossibility of finding a practicable route in that direction for a canal communication.

From Crow Lake, which I reached by the several continuous rapids and blind portages described by way of Belmont and Ball Lakes, and finding no prospect of reaching the head waters of the Rideau from either of those points, although from the cursory knowledge I have of the direction of the Rideau's head waters, I had all along been convinced of the probability of finding a choice of communication from thence to the upper lakes, although at much sacrifice of lockage, but not in the direction reported to your Excellency; I reached the Marmora Iron Works, and from thence descended the Crow River, and from thence by Heeley's Falls, on the Trent—fixing beyond doubt, that the Otonabee was the most probable, and in all likelihood, the *only* practicable route for the object in view.

Having thus described the endeavors to establish the most eligible route, I now come to lay before your Excellency the operations required on the different sections to render them available for navigation, commencing in rotation, as formerly, from Rice Lake; and under section 1, occur, the Bar at the mouth of the river, the shallows of Danger Field, Robinson's Island, and Yankee Bonnet, and which I would propose surmounting by such additional height to the dam at Asphodel bridge, (proposed as necessary for the improvement of that portion of the Trent) as will maintain Rice Lake *permanently* at or near high water mark, and which from the slight difference of level from Rice Lake to Whitlaw's Rapids, (about 2 ft. 9 in.) can easily be done; at the same time, I would recommend the closing up of the centre channel of the mouth of the Otonabee, with the view of assisting either of the others, in having a clear passage, and preventing the formation of an additional bar, which would be apt to form, if not artificially prevented, and which the formation of piers will ensure.

In raising the waters of Rice Lake a decided general advantage will arise to the surrounding country, in rendering the whole comparatively healthy and insure, at a trifling expenditure, an available navigation to Peterboro', at all times, by the simple adoption of a dam and lock at Whitlaw's Rapids, which is the next obstruction on this section, thereby throwing back water over the Little Lake, sufficient to drown the ripple at the Narrows between the lake and bay, and throw sufficient water into No. 1 lock of the collateral cut from Entrance Bay; thus carrying the navigation from Asphodel Bridge to Peterboro', 40 miles, at an expense of, per estimate, £4,246. 19s. a very inconsiderable amount indeed, when compared to the advantages to be derived, the enumeration of the whole of which I do not consider comes within the immediate sphere of this report.

Section 2nd.—From Peterboro' to Clear Lake, 14½ miles, and rising 147 feet, with a continuation of rapid for 9 miles until reaching Herriot's mill pond in Katchiwannoe Lake, and thereafter the rapids at Young's mill, of short duration.

To overcome these, (the most serious obstruction on the whole route) there can be but one opinion pointed out in the extreme facilities the river affords in its universally high and well defined banks, and the convenience afforded for the construction of dams at suitable distances, to render the intermediate spaces available, the practicability of which system has been so *amply* tested on the Rideau communication, that leaves not a doubt as to the applicability in the present instance, while the existence of tolerably sized dams at present, proves the facility with which such can be constructed when required, But although I should recommend the system as generally applicable to the nine mile rapids, yet, as will be seen by the accompanying detailed and minute plans, I propose leaving the river at the Little Bay, immediately continuous to the store-house, and making part of the present marsh and Bay, a receiving basin, and carrying the navigation inland through the Town of Peterboro', as nearly parallel with the streets as now laid out as possible, along favourable low ground, and well suited to lockage—bounded by the natural mound or bank on the western side—bending its course around to the plain lots, until reaching the natural ravine at R, to which point the levels naturally lead, as shewn on the accompanying plan and section, until reaching the river at S, and into the dead water from Hall's mill-dam, or from the termination of the mound referred to, to carry on a a continued navigation to the summit line of Lee's mill-pond, for which the ground is favourable; and as this would appear in the meantime to be more eligible, it may be deemed sufficient to estimate on this line, leaving the adoption as a matter of expediency hereafter, when the works may go into operation.

I would, therefore, propose for the present, the continuation of the cut to Lee's mill-pond, by which all the mill operations will be left undisturbed, and the wicked chain of rapids avoided.

Having gained the mill-pond by a collateral cut of 2½ miles, with 5 locks, making 56 ft. lift, and the necessary bridges, &c., for the accommodation of the public, the dam and lock system will come into good play, until reaching the foot of Herriot's rapids—by the several locks, dams and excavations, as shewn on the plan and section, from which a collateral cut of one-eighth of a mile will be necessary to carry the line past the mill and rapids, and avoid interfering with the operations thereof, which are likely to become extensive, and secure a more convenient and ready mode of passing this particular spot of difficulty, than by following the river and then by raising and strengthening the present dam, a sufficiency of water can be backed up, with no inconvenience to the adjoining lands, to the foot of Young's rapids—covering the small rapids at the outlet of Katchiwannoe Lake, and throwing sufficient water into the lock of 3 ft. lift at Young's, as shewn on the plan and section—from which to the waters of Clear Lake, a short cut of 70 yards in length, averaging 6 ft. deep, through a gravelly section, will carry the navigation (and completing section 2nd) from Peterboro' to Clear Lake, 14¼ miles, and rising 146—10 ½-3 2-10=150 ft. and at an estimated expense of £66,524 14s. 1d.

Section 3rd.—From Young's to Bobcaygeon, including in its course, through Clear and Stoney Lakes, the Peninsula Falls, Burleigh Chutes, Deer Bay, Buckhorn Rapids, and the navigation of Buckhorn and Pigeon Lakes.

Having gained the waters of Clear Lake, the only operation required to complete the navigation to Peninsula Falls will be a properly constructed dam, to raise the waters of Clear and Stoney Lakes 2 ft. above their present heights, so as to give sufficiency over the outlet of the lakes at lowest summer water, which cannot in any way interfere with adjoining lands, the general character of Clear and Stoney Lakes being rocky and barren shores and in general very abrupt. The Peninsula Falls, gross rise of 25—8 3-10, I propose surmounting by 3 locks and extended wing walls, with the requisite guard lock at the head or summit to regulate the spring floods. From this point the navigation continues through Deer Bay, until reaching Burleigh Rapids, a pitch of 2 ft. 2 in. at which place a most favorable opportunity presents to surmount, what otherwise would have been attended with trouble and expense, in the placing of a lock in the neck of a peninsula, as shewn upon

the general plan, with the necessary excavation, &c., which will carry the navigation, by the construction of a dam at this place over the little chute to Buckhorn rapids or Hall's mill, at which important point considerable work will be necessary in the construction of a lock of 9 ft. 6 in. lift, and excavation across the point of 250 yards in length, by 6 ft. in depth (average) in a mixture of large boulders and earth excavation, and towards the Buckhorn Lake extremity, of rock excavation, as also in the raising of the present or the construction of an additional dam, sufficient to deaden the rapids and swift water above, and throw sufficient additional head in Buckhorn, Chemong and Pigeon Lakes, so as to retain those waters at high water mark, and thereby insure a constant, safe navigation to Bobcaygeon Rapids, where terminates section 3rd, in a distance of 31½ miles, ascending 38 ft. 4 in. at an expense of £21,102 2s. 5d.

Section 4th.—From Bobcaygeon to Balsam Portage (to Lake Simcoe), 26¼ miles,—

Will require the re-construction of the lock at Bobcaygeon, the lower sill being placed, as already stated, at least 3 ft. too high, besides the dimensions of the lock chamber being too contracted for the present contemplated scale, being only 28 ft. in the clear; the cut from the lock head to the bay above will require considerable enlargement and deepening, so as to admit of being properly secured by lining, &c., to prevent the escape of the water through the open fissures of the loose rock, as provided for in detailed estimate; the re-constructions and increased height to the present dam, with the addition of a smaller one, between the upper island and main land, as shewn upon the plan, with the view of giving a sufficiency of wall over the long continued shallows in the river above to Sturgeon Lake—which gained, gives a splendid navigation for any sized craft to Cameron's Falls, and to the very foot thereof, where a most favorable opportunity occurs for lockage into Cameron's Lake, or rather the river leading to said lake, as shewn on detailed plan and section of that place, surmounting the difference of level of 24 10 2-10, by two locks advantageously located on the brink of the rocky bank, with the addition of a guard lock and excavation into the river or mill-pond above—in a distance of only 265 yards, and averaging 6 ft. cutting, passing between the hotel and saw-mill.

Before leaving the extended and fine navigable water of Sturgeon Lake, it may not be out of place to refer your Excellency simply to the fact of the existence of one of the most favorable opportunities ever presented to open up the same extent of country, by so very little assistance from art, as the waters of Scugog River and Lake afford, passing in their course from Sturgeon Lake, from the south-west angle of Fenelon, through the whole of Ops (40 miles in extent, interrupted only by the rapids at Purdy's mill,) touching on Manvers, watering the whole of Cartwright, and part of Reach, at the upper extremity of the lake, and even extending its ramificated contributory branches, rendered partially available (and which little local enterprise would make perfectly so,) into Mariposa, Brock, and Whitby, and as a matter of course not confining its spreading influence to these alone, but enabling an available communication being opened up from the safe and convenient Bay of Windsor (where it is now in contemplation to construct a harbor) by a rail-road, or a good macadamized road, *for the present*, from which point the head of the extended navigation seems to be distant only 18 miles, and which, as already shewn on the particular report on that subject, can be rendered available by the simple operation of one dam and lock below the present site of Purdy's mill, and at an expense not exceeding £2500, (under *proper* management)—thereby affording an immediate relief to those rapidly settling districts—at a trifling outlay, until the thorough main channel of communication should be opened up, and then affording a permanent local benefit to the townships immediately bordering on the Scugog River and Lake, as also on the contributories, the Non-eam and Cross Creeks.

To resume my sectional description of the main line:—Having gained by the operations stated, the summit of Cameron's Lake, as the river above the dam, particularly at the outlet into Cameron's Lake, at low water, does not exceed eighteen inches, it will be necessary that the dam now existing, and which is one of the most substantial and creditable pieces of workmanship I have seen in the Province, should be raised from 2 to 3 ft. to assist in giving sufficiency of water over the bar at the mouth of the river, where some rock excavation will also be necessary; but if the banks will bear it, and I have no doubt but they will, even a greater increase would be advantageous, not only in the saving of rock excavations at this point (under water) but in materially assisting operations at the foot of Balsam Rapids, which point the navigation reaches easily through the deep Cameron's Lake, and up either of the channels of the river, communicating with Balsam Rapids and Lake, where operations of considerable magnitude, compared to the trifling difference of level, will be requisite to connect with Balsam Lake in the construction of a lock of 3 ft. lift—and a continuous excavation chiefly through rock, for 450 yards to the river above, at point B, where a dam will also be required to throw sufficient water over the bar and into Portage Bay—on the summit level of the chain of communications, from the Bay of Quinte to Lakes Simcoe and Huron, making a distance of section 4th of 26¼ miles, and rising 34 ft. at an expenditure of £25,546 16s. 2d. Currency, being a total difference of level above Rice Lake, with the increased head on Balsam Lake of 227 ft.; above the Bay of Quinte,=592 ft.—assuming Balsam Lake to be 3 ft. above July mark, and 118—6 ditto above Lake Simcoe, and assuming Lake Huron, as shewn on the map, 594 ft. above the sea, would seem to leave a difference of level between Lakes Simcoe and Huron of 110 ft. odd, say 110 ft. 6 in.

Next comes the last sectional division of the route No. 5, and one, as already stated, upon which there is sufficient scope for the Engineer's duties—not in point of any very untoward difficulties to be surmounted, but in the proper selection of the most eligible route from Balsam Lake to Lake Simcoe, between which there is a difference of level of 118—5—3 in the present state of the waters, an amount far beyond what was anticipated, and which, consequently, suggested the strictest investigation into the merits of the two probable routes already spoken of, viz.: to follow, as much as may be available, the course of the Talbot River from its source downwards—or to adopt an eligible line for a more continuous navigation from Balsam to Lake Simcoe, and for which latter the face of the country affords (with the exception of a trifling rise near Balsam Lake) an opportunity equalled only in one instance in the course of my observation in either Province, and in that for a more limited distance, (viz, on the line for a continuous canal from Lake St. Francis to Lake St. Louis, which runs through the Seigniory of Beauharnois, and which I estimated last year for the Honourable Edward Ellice, in contra-distinction to the other side of the river—the expense being much less). Still, how-much-soever I might be disposed to avail of such facility for continuous navigation by a cut to Lake Simcoe direct,

yet there are circumstances sufficiently urgent to give the preference to a *medium* between the two, and which, I have no doubt, will present the most eligible for adoption, as in tracing the Talbot River from its commencement in the great swamp near Balsam Lake to Lake Simcoe, in all its freaks of serpentine curvature, which I did in the month of June, when the water was very low, as well as in the months of October and November—I fully came to the opinion that to follow the Talbot higher up (as for the sake of description I would beg leave to reverse the order and commence from Lake Simcoe), thus the commencement of the rapids, at McQuaig's rapids or house, as marked Q on the accompanying detailed plan, made from actual survey, with the view of ascertaining the real nature of the river, would not only be exposing the works to much tardiness of execution from the limited period in which operations could be carried on among a continuation of rapids, but at the same time, when done, would add much to the length of the communication—the direct line with the point of junction with Balsam Lake, being only 13¾ miles in extent—and although I should certainly look forward ultimately to carry the navigation to this point, or into the Simcoe Portage reach—yet, in the meantime, I would suggest the propriety of leaving the Talbot either at the convenient and commodious basin, as shewn on the plan at D, 1¾ miles above the mouth, &c., or above the termination of the lately constructed road from Balsam Lake—and from the said basin, or point T, to carry an inland cut to Balsam Lake, as per line delineated *red* on the plan, with the necessary 12 locks, of, in all, 116 lift, as thereon shewn, or as may afterwards be found more convenient to locate, for which, as already stated, the section of the country is most favorable, with the exception of considerable rock excavation in bedded limestone on leaving Balsam Lake, which, however, will meet well the purposes of lock building, of which there will required to be in all the inland cut 12 locks, (of different feet lift each) besides on the Talbot River, between Lake Simcoe and Talbot basin, of nominal feet lift, with the requisite continuous excavation, culverts, bridges, &c., together with the necessary operations at the mouth of the river, in the removal of the bar by the construction of *piers*, to prevent its again forming; thus overcoming the obstruction in this section by an inland continuous cut from Balsam Lake to Talbot River at T, of 13¾ miles, with 12 locks thrown at suitable distances as shewn on the plan and sections, by one lock on the Talbot river, if found necessary, and the construction of the necessary works at the mouth of the river, in all 16½ miles; descending 121—1 3-10 feet by lockage, or 118—5 7 10 natural difference of level, at an expenditure of £121,212 18s. 1d. Currency.

For the sake of perspicuity, I beg leave to annex a recapitulation of the whole for your Excellency's information, which at one view will shew the abstract of operations required, amounting in all to the sum of £262,067 16s. 4d. and for which I consider these works may be constructed in a permanent, substantial, and workmanlike manner, and under a similar specification as intended for the Trent works, viz —" Of good substantial hammer-dressed masonry, with ashler hollow quoins, corners, and coping, wooden sills, &c., &c."—Thus opening up an *uninterrupted* water communication from the Bay of Quinte to Lake Simcoe, a distance of *about* 195 miles, and 706—4 feet of lockage, for the sum of £495,515 *odd*, Currency, including the Trent estimate, which amounts to £233,447 6s. 11½d. Currency.

RECAPITULATION.

Sec. No.	Description of Route.	Miles.	Rise.	Dms.	Loc.	Amount. £	s.	d.
1	From Rice Lake to Peterborough, including the bar at the mouth of the Otonabee, Danger Field, Robinson's and Yankee Bonnet Shallows, Whitlaw's Rapids, &c.....	$21\frac{22}{80}$	ft. in. 4 6	2	1	4,246	19	0
2	From Peterborough to Clear Lake, including the nine mile Rapids, Herriott's Rapids, Katchiwannoe Lake, and Young's Rapids,.....	$14\frac{31}{80}$	147 6 3 lock.	6	14	66,524	14	1
3	From Young's outlet of Clear Lake to Bobcaygeon, including Clear and Stoney Lakes, Peninsula Falls, Burleigh Chutes, Buckhorn's Rapids, Buckhorn's Lake, Chemong and Pigeon Lakes,.....	$31\frac{40}{80}$	38 4	2	5	21,102	2	5
4	From Bobcaygeon to Cameron's Falls and Balsam Lake Portage, including Sturgeon Lake, with Bobcaygeon Rapids, Shallows above rapids, Dams there—Dam at or below mouth of Little Bobcaygeon, navigation of Sturgeon lake, Cameron's Falls and Shallows, Cameron's Lake, Balsam Rapids and Balsam Lake,.....	$26\frac{23}{80}$	34 0	3	5	22,546	16	2
5	From Balsam Lake to Lake Simcoe, including collateral cut to Talbot River, Locks thereon, clearing of flood wood, and piers at the mouth of Talbot Harbour,.....	16	Fall of Collateral Cut. 118 5-3	.....	12	121,212	18	1
	Amounting to.....					£235,643	9	10
	Lock Masters' houses, &c.....					2,600	0	0
						£238,243	9	10
	To which add contingencies and management, &c., 10 per cent.....					23,824	6	6
	Total amount of Estimate,.....					£262,067	16	4

N. H. BAIRD, *Civil Engineer, M. I. C. E. L.*

Having now, for your Excellency's information, submitted the result of my labors, and of a more protracted survey than I had anticipated, arising from circumstances which often give rise to, and create more difficulties in the progress of the Engineer's operations than the real difficulties presented, namely the different supposed routes which offer themselves to consideration, as imagined eligible, through the different sections of country in which they occur, and pressed upon the attention as the best, or as in many instances, the *only* practicable route—thereby diverting the attention and occupying that time which would have been more advantageously directed to the natural course of the communication, but which, from the circumstance of a doubt existing or possibility thereof, leaves no alternative but to follow out such, if in any way feasible; and under such impression, I was lead to make the tour of the back line of Lakes, Rapids and Portages, from Stoney to Crow Lake, which, as already stated, served but to confirm the prior opinion of improbability, as also in examining the lay of the country, through different townships of Eldon and Fenelon, as directed in your Excellency's detailed instructions, per Lieutenant Colonel Rowan's communication of date 16th June last, particularly the portion bordering on, and in the proximity rather of Lake Simcoe and Sturgeon Lake; but soon ascertaining that such a route must entail with it, not only a very material increase in distance, but at the same time an increase in lockage, and without any certain supply of water from a summit level, the country rising gradually towards that course from the Talbot valley (certainly the lowest ground in that section of country) until again falling into the Sengog—and having followed that fine river and more expanded lake navigation to its head, and ascertaining, geographically speaking, that that route, although apparently feasible towards Lake Simcoe, would be entirely too circuitous.

After due consideration of the matter in all its bearings, and weighing the merits of the junction with Lake Simcoe, through the Sengog route, which must have been down the valley of the Little Talbot to Beavertown, a stream by no means bearing comparison with its greater rival of the same name, independent of the want of accommodation for shipping, except at a very great outlay of money, and by the *Seagog Lake* route, following either the North Cross-Creek route, 7 miles above Purdy's mill, into the centre of Mariposa, where the height of land occurs—or continuing up the Lake, take the Non-can River or creek at the north-west angle of Cartwright and crossing the south-west angle of Mariposa, gain the height of land in Brock, and from thence descend into Lake Simcoe, down the Black River Valley, which holds out no particular inducement or accommodation for lake craft, which at times will be hard enough pressed to find shelter, all independent of the geographical objection in point of distance—not only in a local view, from Sturgeon Lake to Lake Simcoe, but in following up the ulterior object of continuing the chain of communication with Lake Huron—all of which will be avoided, and the grand object of the most direct and least expensive mode of connecting these waters obtained by the Balsam Lake route; and the Talbot River, as now estimated, besides having the double advantage of bearing out the general character of the whole line as an *internal* communication, opening up a widely extended and valuable country and one which promises, ere long, to be second to no proportionate space of inland country in the Province, in point of capabilities of improvement, productions and opportunities for enterprise.

For the general line of communication and its connection with the adjacent and surrounding country, and showing that the line as now surveyed and estimated is not only the most direct that can be found, but the one most calculated to develop the resources of the fertile and valuable country through which it passes, I would beg to refer your Excellency to the accompanying general plan which I have had compiled (by Mr. F. P. Rubidge, D P S) to shew the whole line at one view, with the different works proposed to render the whole navigable, by which it will be seen, that from the Bay of Quinte to Lake Huron, the general direction of the communication maintains a pretty straight course—that assuming the section from Lake Simcoe to Huron as practicable, and which I extremely regret was not in my power, on account of the advanced state of the season, to have examined, as stated by your Excellency as desirable, when I last had the honor of an interview, and with which intention I did proceed to the Narrows of Lake Simcoe, from the Talbot River, when the difficulty of procuring a proper canoe and crew, and accommodation proper for the excursion, (having left my canoe, &c., at the Talbot, to complete some measurements, under an assistant,) added to the apprehension, which afterwards turned out to be well founded, of being frozen up in some of my operations below, resolved me (then the 5th of November,) to abandon the task; but still I had the satisfaction of gleaning a considerable deal of information from the kindness of an individual in Orillia, who is much interested in the furtherance of the grand object—and the perusal of a report, drawn up by an Officer of Engineers, on the state of the Severn River, and which, from the *general* description therein given, would appear to be not more sectionally objectionable for improvement, than what has been met with on the lower sections of the route—the difference of level, as already stated, being about 110 feet.

I would also state that I had, at the same time, an opportunity of gaining information as to the projected route (by a Mr. Boyde), from Shingle Bay, but which from the general principle, as I understand the description, nearly double the lockage would have to be encountered, than by a gradual descent; besides, judging from past observation and experience, and studying the course of nature in her multiplied arrangements, it ever appears that the lowest pass between any two sections of country is generally, if not always indicated by the greatest discharge of water—although, as a matter of course, and one in all cases not to be avoided, the route may be somewhat circuitous. I would, therefore, be disposed to hazard the opinion, that either by the Severn or Nottawasaga Rivers must be the line of communication, unless the latter be intercepted from Lake Simcoe by a considerable height of land, which I have not had an opportunity of examining; in support of which hypothesis, and which I consider by no means problematical, I would refer, as an example, to the country lying between Peterboro' and Chemong Lake, around which the River Otonabee, the main outlet from these waters down the Trent, &c., makes such a circuitous bend of no less than 23 miles—that having traversed the country between these points in all directions, for the purpose of endeavoring to find a practicable over-land route, and actually running levels of the most probable, I found the lowest ridge of land to be 49 ft. 4 8-10 above the waters of Chemong and Pigeon Lakes, diminishing proportionately, on approaching the outlet, and *vice versa*, I might quote many other instances, which have come within my observation, to strengthen the hypothesis, that the country between Lakes Simcoe and Huron may have a similar sectional character—unless some convulsion of nature may have interfered in the general arrangement.

Having thus attempted to lay before your Excellency the result of a very minute and detailed examination of the country lying between Rice Lake and Lake Simcoe, with the lakes and waters thereon, and of a series of running and detached levels, as in terms of your Excellency's instructions, and in pointing out what I conceive to be the most eligible line for connecting those lakes, I should now proceed to point out the prospective benefits likely to arise from the adoption and execution of such a measure, but for which task I really do feel an inadequacy to do the subject the justice its importance demands, whether considered in a political or commercial point of view; but as such is generally expected from, or to wind up, an Engineer's Report—particularly if such should refer to operations proposed through any new (and scientifically unknown) country as the route I have just had the honor to examine—I shall use my best endeavors to comply with the task.

As the great object of Internal Improvement through any country, is to afford the means of cheap and expeditious transport for the resources thereof, and to afford the opportunity of connecting the most distant points of fertility and scenes of industry and enterprise with their respective marts, it follows that the shortest and most available route for such an object must be the *sine-qua-non-data* upon which to start—and which, with a due regard to the local interests at the same time through which such line of communication may pass, for the development of the resources of wealth and enterprise, in which every section abounds, have been the regulating principles in the selections made, and which I flatter myself will be found unequalled in any other, in a geographical point of view, viz, the affording a thorough communication for the produce of the Western countries bordering on Lakes Simcoe, Huron and Michigan—particularly Illinois, Indiana, Michigan and Huron Territories, and partially Ohio—all rising rapidly into the first scale of commercial importance, in their rich productions, now pouring down the rapids of Detroit and St Clair, from and across those immense inland seas into Lakes Erie and Ontario, and by the famed speculation of the Erie Canal, which was at first, and for long, considered to be so chimerical an undertaking; but now demanding, from the consequent development of those fertile regions, increased dimensions—still, however, subject to the inconvenience of such very hazardous circumnavigation, as a single glance at the map of the Province and adjoining States will demonstrate, and which every season affords fresh instances of the melancholy occurrences, in the many shipwrecks and loss of life and property in consequence, must point out as an ulterior object to be gained, that the tide of the Western trade, at least a great proportion thereof, would naturally find its way by the safer, more expeditious and certain route, the Georgian Bay, and from thence down through the now proposed line of communication, by Lake Simcoe, the waters of the Newcastle District, and the Bay of Quinte, thereby saving, as already observed, not only the very perilous circumnavigation of Lakes Huron, Erie and Ontario, but absolutely shortening the route the inconceivable distance of 261 miles.

Having reached the Bay of Quinte at the conflux of the splendid River Trent, so very susceptible of improvement, as shewn by the detailed report I had the honor to address to your Excellency in 1833, the transit from thence to our own mart becomes a matter of ease and safety, either by the St. Lawrence or by the present available and certain navigation of the Rideau and Ottawa Canals, now in active operation, and, for our neighbors, affording an opportunity of transit and communication with New York market through the Upper Gap to Oswego—at which point the Erie Canal touches in its course—but as the St. Lawrence and Rideau must be allowed to be the natural outlet for Upper Canada, the proposed improvements, as a matter of course, should be contemplated in connection with these outlets, particularly the most practicable and available for general purposes of commerce, although when the gigantic improvements on the St. Lawrence are completed, she must stand unrivalled in the annals of internal navigation in point of magnitude of construction—and which, of course, is intended to draw the Western trade in that channel, which the intended improvements from the Bay of Quinte to Lake Huron *must insure.*

To the local advantages which, from the extent of country traversed, may with propriety be called *national*, it would almost be presumptous to set limits, and in which I conceive I am borne out in the retrospective glance of the rapid strides now making towards settlement and development—I may say, from the Bay of Quinte to Lake Huron, under the most untoward and inconvenient circumstances a young country could expect to progress—land-locked with the worst of roads, where such exist, and equally so with the present state of the river and lakes in their several insurmountable rapids, to any description of craft but the fragile bark canoe, and that only in descending—the improvement of which latter would unquestionably unfold the resources in a ratio I should be at a loss to name, was such an outlet afforded.

To agriculture, the great stand-by of any country, I would add the immense increase in the article of lumber, of all descriptions, now carried on to a very limited extent (by a few of those enterprising, hardy speculators, with which the country so copiously abounds,) particularly in the article of staves, for which abundance of the finest oak exists, untouched and unvisited but by the Indian—affording, with an outlet, unlimited scope for individual enterprise throughout the whole line of communication, to say nothing of the vast importance in point of settlement of those fine districts, bordering on and adjacent to the several extensive lakes, and which have of late drawn the attention of wealth and enterprise to their shores.

Of the benefit to be derived from the opening of the Trent above, it may be conceived superfluous to again refer, having been discussed in my former report on that river and its contributaries—and would but briefly again refer to the importance of having an outlet for the wares of the Marmora Iron Works, so much required in a new country, and which may be viewed in a political or national, as well as commercial light.

To sum up these cursory observations I would merely call your Excellency's attention to the different Townships through which the communication is intended to pass in its course through the Home and Midland Districts, in number no less than *nineteen*, immediately bordering on the waters of the communication, besides bringing into play as many more, with all their agricultural and commercial resources, with their respective already populous settlements, as sufficient guarantee, independent of the great *through* communication object, which, as a matter of course, must positively insure an ample return to the Province of the outlay required—really of secondary consideration to the object to be gained—and to the Home Government, in the ready settlement of those vast tracts of fine lands throughout the Province, now *inaccessible*, an ample return for any interest which

the Mother Country might be induced to take in such a national undertaking—were it only with the limited view of enhancing the value of Crown Lands, but particularly, I should say, in rendering fully available the great outlays on the Ottawa and Rideau Canals, of which the contemplated communication may now be said to be a *continuation*.

I would further remark—and perhaps it may be presumptuous in me so doing, but I feel as if I owed it as a duty to the land of my adoption, as well as within the sphere of my instructions—that if we intend to maintain our commercial importance in the scale of nations, and preserve for ourselves an *independent* port of entry for the Canadas, something must be done, and that immediately, to secure such; and nothing, it is believed, will tend so much towards such a desirable object, as an early commencement of this internal work, which not only does more immediately interest all Upper Canada in promoting, by any means, and at all hazards, but not less interested is Lower Canada—which should consider the cause as intimately and more immediately connected with *her* existence, as the outlet not only for *all* our exports, but as a natural reciprocating consequence, the imports into these Provinces. On this subject our enterprising neighbors on the other side are wide awake, and who make no hesitation in their different reports and remarks on their further proposed communications, which have of late engaged their attention—and about some of which they seem in good earnest to make frequent allusion to the contemporary rival to all their projected lines to market—"*The back waters of the Newcastle District and the River Trent*" Shewing distinctly the importance *they* attach to such a direct line from the *far* west—as likely to anticipate, if put in execution, their best exertions; but unless we be more active in the cause than we have hitherto shewn any disposition to be, I fear we shall be anticipated by their well known prompt and energetic measures, and that those natural facilities of communication may lay dormant, and the surrounding country and resources with it—and that the year now ensuing will go far to decide the question, I believe, is generally admitted on all hands, "whether we give up the "cream of our resources, the Carrying Trade, to a foreign power, thereby rendering all our immense expenditure as well as the bonus of the Mother Country, more an injury than a benefit to the Province."

I would further remark, for your Excellency's information, that whilst on the importance of the most prompt and energetic measures being used to open up the grand internal communication, so nearly and intimately connected with the vital interests of these Provinces, that as much of the intrinsic importance in the opening up such a communication, having so many rival competitors, however-so-much in embryo, will depend upon an *early* commencement (as an earnest of the intentions of the Provincial Government) and expeditious execution, for the reasons I have endeavored to assign, and which might be multiplied beyond the limits of this report the expediency of adopting such measures and system in execution, as would as early as possible secure the results contemplated, and on which subject I would beg to refer your Excellency to the interim report I had the honor of submitting some months ago, (30th September) suggesting the expediency, for reasons therein assigned, of, in the first place, constructing with all expedition such works along the whole line of communication, as might at the smallest expense, (as per estimate of respective sections which I have all along purposely kept detached) open up the greatest extent of navigation, or in other words, the least expensive sections along the line, such as on the River Trent – the dam only at Widow Harris'—the operations at Chrisholm's rapids—the dam above Heeley's falls, and works at Asphodel Bridge or Crooks' rapids—thereby opening up the navigation from Widow Harris' (9 miles above the Bay of Quinte) to Percy Landing, 21 miles, and again from Heeley's Falls to Peterboro', by the construction of the small dam and lock of 3 feet lift at Whitlaw's rapids, half a mile below Peterboro', and again on the present section from Peterboro' to Lake Simcoe, or more properly from Rice Lake to Lake Simcoe, by the construction of the dam at Buckhorn rapids, sufficient to maintain Chemong Lake at or about high water mark—by the water at Bobcaygeon, Cameron's Falls, and Balsam rapids to Balsam Portage, with the proposed works on and at the mouth of the Talbot River—leaving the intermediate and more expensive, but short sections, from the mouth of the Trent to Widow Harris', 9 miles; from Percy landing to head of Heeley's Falls, 11 miles; again from Peterboro' to Chemong Lake, 8 miles, in place of 30 miles, as per river and lakes as stated; and lastly, from Balsam Lake Portage to the basin on the Talbot River—to be railwayed *in the mean time*, for which it is rather remarkable, the whole of the ground of these intermediate sections affords the most favorable opportunity for construction that can be imagined or wished for, any descent that is being in the proper direction, and easy of formation.

As an *expedient* only do I venture to suggest to your Excellency's consideration, the adoption; at the same time I am perfectly convinced that the plan will meet with some local opposition, in the apprehension of its practical utility, superseding probably the necessity of (for some years) carrying the through water communication into operation, which would better suit for the transport of heavy lumber; but which objection I should be desirous of removing, by the construction at the most difficult falls, of *slides*, which cost comparatively little, and much *better* suit the purpose for heavy lumber, than lockage; the intermediate rail-road system (without transhipment) serving every purpose of the transport of staves down—and the requisite outfittings for lumber establishments upwards—and for a general carrying trade, equally answering every purpose, until its increase should be such as to warrant the putting the whole in full operation.

By this mode of adoption, the communication would be three years earlier opened up than in waiting for the completion of the whole—an immense saving in the *interest* of expenditure effected, such as would go far towards the formation of such expedients; and when the trade and traffic of the country should require, or when it might be found necessary to carry the grand scheme into effect, I am satisfied, from the experience I have had in conducting such heavy works in the interior of a *new* country, that the facilities which such means of transport of materials, &c., would afford, would compensate for the execution, taking credit for the raw material, and when it might be deemed necessary (if ever) to remove them, particularly applicable to the inland sections; in consequence, this latter argument would not bear so strong upon the 9 mile section of the Trent.

With the view of doing away with the only, at least the chief objection to the expedient system—the idea of frequent transhipment, I would propose that long and substantial steamers, of particular construction, should regularly ply to and from, on the intermediate extensive water communication, viz.:

From Widow Harris' to Percy Landing.....21 miles
From Heeley's Falls to Peterboro', about.....55 "
From Chemong Lake to Balsam Lake Portage.....40 "
From Talbot River to the Narrows, or Kempenfeldt Bay as the case may be.....22 "

And so arranged as to admit of the train of cars being transported at once, with their loadings, direct either from Lake Huron or Lake Simcoe, as the case may be, and which I am satisfied can be done in such a way as to be practically useful, and serve well the present, and until such time as it may be deemed proper to put the lockage system in execution, the prospective wants of the country; and for the purpose of enabling your Excellency to form an opinion on the merits of the plan, I annex an appropriate estimate of the opening up the whole route from the Bay of Quinte to Lake Simcoe and Lake Huron, on the combined system, by which it would appear the whole may be accomplished for the sum of £195,565 6s. 6d. currency, somewhat more than I formerly hazarded to your Excellency in my interim report, and may be completed in two and a half years from date of commencement.

Having endeavored to set before your Excellency the advantages likely to arise to these Provinces and the Mother Country from the *early* opening up of the communications now under review, in a commercial and political point of view, in so far as consistent with the limits of this report, I should consider the task but half performed, did I not in some degree refer to the *incalculable* facilities which, in a military point of view, would as a natural consequence, follow the completion of such a work as connecting the Bay of Quinte with Lake Huron, or in reality the Atlantic with the far West—completing the chain of communication (so generously commenced and so far completed and practically useful to the country) from the Atlantic to Michigan and Sault St. Marie, by the works of the Carrillon, Chute au Blondeau, and Grenville Canals on the Ottawa River, and thence by the Rideau to Lake Ontario, an internal navigation of immense extent, say 1214 miles—but by the present circumnavigation already referred to, 1475—difference 261 miles, in rounding the Upper Canada Peninsula by the River and Lake St. Clair, and by a lockage of apparently only 33ft. at Sault St. Marie, carry the navigation into Lake Superior and regions beyond, at little additional expense—thus admitting of the transport of stores to the most distant portions of the Province, with the greatest ease, certainty and expedition, and in which point of view I would particularly call your Excellency's attention to the combined system *in point of despatch*—having not the smallest doubt but the passage from the Bay of Quinte to Penetanguishene could be accomplished, on the combined system, in 30 hours—or even less.

Having thus completed the result of the examination, levels, &c., of the country between Rice Lake and Lake Simcoe, as in terms of your Excellency's instructions, and in accordance with the spirit of the Address of the House of Assembly, of the important undertaking with which I have had the honour to be entrusted,—I beg leave to submit the whole for your Excellency's information, trusting that I have fully complied with your Excellency's intentions, and that if in any instance I may have exceeded my limits, that such has been dictated from a sense of the particular predicament in which our common interest seems placed; demanding that some active measures be adopted to save our best interests from passing into other hands, and diverting the trade of the far west from its natural outlet, and which a cursory view of the general map will amply demonstrate.

I have the honour to remain,
with much respect,
Your Excellency's
Most obedient, humble Servant,
N. H. BAIRD,
CIVIL ENGINEER,
& M. I. C. E., LONDON.

ABSTRACT ESTIMATE

Of the expense of effecting a Communication from the Bay of Quinte to Lakes Simcoe and Huron, via, the Trent and Back Waters of the Newcastle District, on the combined principle as referred to in the foregoing Report.

				Currency. £.	s.	D.
From the Bay of Quinte to Widow Harris'....	9	miles,	Per Railroad,	17,500	0	0
" Widow Harris' to Percy Landing....	21	"	" Navigation,	14,114	7	6
" Percy landing to Head of Heeley Falls....	11	"	" Railroad,	12,000	0	0
" Heeley Falls to Peterborough Basin....	55	"	" Navigation,	21,359	8	10
" Peterborough to Chemong Lake....	8	"	" Railroad,	15,000	0	0
" Chemong Lake to Bal-am Lake....	40	"	" Navigation,	33,362	17	4
" Balsam Lake to Talbot River....	13¾	"	" Railroad,	27,000	0	0
" thence along River to Lake Simcoe....	2¼	"	" Navigation,	7,450	0	0
" acro-s Lake Simcoe to Narrows....	22	"	" Navigation,			
" Narrows to Lake Huron, say....	15	"	" Railroad,	30,000	0	0
Making in all....				£177,786	13	8
To which add for contingencies, management, &c....				17,778	12	10
Making a total of....				£195,565	6	6

N. H. BAIRD,
Civil Engineer, M. I. C. E., L.

MEMORANDA OF LOCKAGE.

One	Lock....	at Whitlaw's Rapids.
Five	do	at Peterboro', and to Lee's Mill-pond.
Six	do	from Lee's to Herriott's.
One	do	at Herriott's Mill.
One	do	at Young's do.
Three	do	at Peninsula Falls.
One	do	at Chute (Deer Bay).
One	do	at Buckhorn Rapid.
One	do	at Bobcaygeon.
Three	do	at Cameron's Falls.
One	do	at Balsam Rapids.
Twelve	do	from Balsam Lake to Lake Simcoe.

In all 36 Locks, besides 2 Guard Locks 341 ft. $3\frac{3}{10}$ in. Lockage.

INTERIM REPORT

To His Excellency SIR JOHN COLBORNE, *K. C. B., &c., suggesting the expediency of a combined system of Communication from the Bay of Quinte to Lake Huron.*

BY N. H. BAIRD, CIVIL ENGINEER.

To COLONEL ROWAN,
CIVIL SECRETARY:

SIR,—At this stage of the survey of the water communication from Rice Lake to Lake Simcoe, in connection with the River Trent improvements, and looking forward to the ultimate end in view, viz.—a communication between the Bay of Quinte and Lake Huron, I feel myself called upon to lay before you, for His Excellency's information, the result of my labours up to this time, in a condensed form, in case the result thereof might lead to other arrangements which might be more conveniently carried on now than at a future period.

On running the levels from the Otonabee River at Peterboro' to the head waters in Chemong and Pigeon Lakes, I found the difference to be much greater than was anticipated in my Report on the Trent improvements, as also the difference of level to Lake Simcoe, equally so, and which, for perspicuity, I shall now enumerate in order, viz.:

From Bay of Quinte to Rice Lake....				365 ft. 0 in. 0 pts.
" Rice Lake to Peterboro'....	4 ft.	6 in.	0 pts.	
" Otonabee River to head water Chemong Lake....	189	9	7	
Bobcaygeon Rapids....	6	6	0	
Cameron's Falls....	26	8	0	
Balsam Rapids....	2	4	7	
To Lake Simcoe, (descending)....	118	5	3	
Making difference of levels from the Rice Lake to Lake Simcoe....				348 3 7
Lake Simcoe to Lake Huron, assuming the Lake 594 feet above the sea....				110 0 0
Total lockage from the Bay of Quinte to Lake Huron....				823 ft. 3 in. 7 pts.

Conceiving from the very great extent of lockage, the sum unavoidably necessary to accomplish such, (on the most economical principle) and regarding the improvements now in progress and in agitation *every where*, to command the commerce of the Western Territory, and divert it from the natural outlet (the Trent), it has occurred to me, and I am strongly impressed with the conviction, that a species of communication might be adopted, with advantage, between the Bay of Quinte and Lake Huron, to answer every purpose required, in the meantime, with the advantage of increase of speed to a considerable extent, and would propose for the expensive sections of the Trent, and along the line of communication to Lake Simcoe, to substitute Railroads, viz.:

From the mouth of the Trent to Widow Harris'.....	9	miles.
" Percy Landing to summit of Hecley's Falls, about.....	11	"
" Peterboro' to Chemong and Pigeon Lakes.....	8	"
And from Balsam Lake to Talbot River.....	13¾	"
Or Lake Simcoe, direct.....	16½	"

Making in all, from the Bay of Quinte to Lake Simcoe only 41 miles of Railroad.

The communication to Lake Huron, from Kempenfeldt Bay, I am not in possession of sufficient data to say what proportion may be railwayed, but from the lockage being so heavy, I am disposed to think the combined principle may be equally applicable on that section.

The whole expense of opening up a direct communication from the Bay of Quinte to Lake Simcoe, on the combined system, will not exceed the sum of £195,565 6s. 6d. and may be completed in three years.

By continuous lockage, £495,515 3s. 3½d.

In the one case the passage of goods from the Bay of Quinte to Lake Simcoe may be accomplished with ease in twenty-four hours, whilst by the other three days would be required.

From the manner in which the arrangements can be effected, the wagons will pass directly, with their loads, from Lake Simcoe to the Bay of Quinte, and vice versa undisturbed, by steamers constructed for the purpose, to ply on the intermediate waters.

Having laid this cursory view of the subject before you, for His Excellency's consideration, feeling it a duty I owe to the country, as well as in accordance with the spirit of the instructions I have in command from His Excellency, I shall be glad to be informed whether His Excellency would approve of the estimate of such a communication being made out, to lay before the House, in addition to the lockage estimate, or whether the latter should not be dispensed with in the mean time.

I must beg to be understood in recommending the combined system, that it cannot in any manner interfere with the through water communication, in any other than to materially lessen the estimate, when it might be carried into effect, in the construction of which a saving nearly equal to the expense of such intermediate railroads would be effected.

Awaiting His Excellency's commands—

I have the honor to be,
Sir,
Your most obedient Servant,

N. H. BAIRD,
Civil Engineer.

REPORT

To His Excellency SIR JOHN COLBORNE, *Knight Commander of the Most Honorable Military Order of the Bath, Lieutenant Governor of the Province of Upper Canada, Major General Commanding His Majesty's Forces therein, &c., &c., &c., on the practicability of rendering the River Trent navigable from its mouth or confluence with the Bay of Quinte to Rice Lake.*

By N. H. BAIRD,
Civil Engineer,
M. I. C. E., L.

In obedience to Your Excellency's commands, transmitted to me by Lieutenant Colonel Rowan, Civil Secretary, in his communication, bearing date 19th March last, as well as subsequent correspondence, I proceeded upon the 7th day of September last to the mouth of the Trent (the state of the water preventing an earlier inspection,)for the purpose of attending to the import of my instructions, viz : To survey and estimate the expense of rendering that River navigable for Steam Boats drawing five feet water, with Locks of commensurate dimensions, 134 feet in length by 33 feet in the clear, the result of which examinations, survey and levels, I have the honour now to lay before your Excellency.

Before coming to a conclusion, as to the mode most likely to be attended with expediency in rendering the River navigable, I conceived it necessary, first, to traverse and explore the whole course of the River, its banks and contiguous ravines, the result of which determined the principle upon which I should proceed to estimate the difficulties to be overcome, and taking into account the great quantity of water in the River (nearly the second in the Province in point of discharge) the effects which such might have on the construction of the different works required, connected with the vast accumulation of anchor ice along the banks and shallows, and from the very great facility afforded, from the favorable nature of the banks, as illustrated by the several sections accompanying, the principle of damming the River, would seem, under all circumstances, to be the preferable mode of overcoming the several obstructions, and upon which principle I shall proceed to point out to Your Excellency the manner in which I would propose surmounting the obstacles to such a grand and available stream.

It will, however, in the first place be necessary, in order that Your Excellency may have a comprehensive view of the subject, to enumerate, in as condensed a form as may be consistent with the extent of the undertaking, the several obstructions to the navigation of the River, from its mouth to the Rice Lake, and may be classed under the following general sections, viz:

feet	in.	
116	5	9

1st. The rapids, commonly called the nine mile rapids, extending from a mile above the mouth to navigable water at the Widow Harris', rising in all 116 feet.

8	7	8

2nd. After passing along a fine navigable sheet of water, available at present for moderate sized craft, for six miles, the Little, or Chisholm's Rapids, present themselves in extent 1100 yards, and rising 8 7 8 feet to Chisholm's sawmill, which leads to a still finer sheet of navigable water, with a moderate current, not less than 12½ miles to the Percy Landing at which place the 3rd section commences, in extent 12½ miles to Crow Bay, and rising 150 feet—with the exception of a small sheet or pond opposite to Major Campbell's new settlement in Seymour, the whole of this Section consists of a series of rapids interrupted only by big Falls, Chutes, &c.

150	5	3

From the foot of Crow Bay (along the bay) the water is of sufficient depth for 1½ miles until reaching the foot of the rapids from Heeley's Falls in extent 1½ miles,at which point, commonly called the Forks, being at the confluence of the Crow River with the Trent, commences the next series of obstacles, the 4th in rotation which embraces Heeley's Falls, extending as stated 1½ miles* where commences the Long Reach, navigable for 13½ miles with the exception of three shallows* or rifts which as will afterwards be detailed, may be easily overcome, to the foot of Crook's Rapids immediately below Asphodel bridge, six miles from Rice Lake; at this point the 5th and last general section occurs, in extent about ½ a mile and rising 7 ft. 9 in.

*72	9	5
*4	2	0
Natural rise	7	9 0
Increase	0	5 0
	8	2 0

	0	5
	8	2

which overcome brings the navigation into the head or summit pond of Rice Lake, making from the mouth of the River at the Bay of Quinte, a total rise independent of the natural current along the several navigable portions, which of course I wave,

	ft.	in.
of	360	8 5-10
rifts	4	3 5-10
	365	0 0

in a distance of 61 miles, and which I would propose to overcome by the following operations; and in detailing which, with reference to the plans and sections, I trust I may succeed in laying the matter in as clear a light before your Excellency as the subject will admit.

With reference to the abstract of obstructions to be overcome, the 1st or nine mile rapids present the most formidable, the natural rise to Widow Harris' at the then lowest pitch of water being 116 feet 5 inches 9-10ths.

These being a continued succession of rapids, cascades, chutes and shallows, until reaching the small pond of still water near the Highlands above O'Connor's Tavern, I propose surmounting by the construction of dams and locks, with the requisite excavation for the foundations and entrances, as shewn on the sections, placing the first or entrance lock in the now dry channel at the head of Myers' Island, and taking advantage of the present channel between the Island and main shore as a line of ingress, as shewn on the detailed plan. The navigation keeping the channel of the river,* until reaching below Robinson's Mills, at which point marked on the plan, a collateral cut will be required for a short distance into the still water at O'Connor's, which being raised eight feet, will sufficiently drown the Highland Rapids to throw the requisite depth into another collateral cut, as shewn on the detailed plan, along a meadow, chiefly through rock excavation, upon which I propose to have Lock No. XIII. of 9 feet lift, which will carry the communication into the navigable sheet above Widow Harris's house, at which point the Wing Dam, as shewn, will be required to raise the water sufficiently to ensure the necessary draft of water over the shallows above Lewis Bush's, and before coming to the foot of the little or Chisholm's Rapids, at which place the second Section commences, and which, although of no continuance, and the rise apparently trifling, being only 8 7 8, yet presents considerable difficulty, and which may be overcome with most advantage by one lock of 10 feet lift, the difference from the natural rise (8 7 8) occasioned by raising the long reach above, and by 1100 yards of excavation through lime stone rock, of a nature easy of excavation, and of suitable material for the lock, &c., as the rate per estimate will shew. This section will cost £13814 7 6, and bring the navigation into what I shall (for distinction) call the *Percy Reach*, extending 12½ miles to Percy Landing, the waters of which, however, will require to be raised as shewn in Sections, 1 foot 4 inches 2 by the construction of a Dam at the head of Chisholm's Rapids, on the Table Rock, in order to afford a sufficiency of water the rocky shallows opposite to the Goverment place from the head of Long Island upwards; and will cost, as per estimate, £400 0 0 Halifax Currency, and ensure a perfect navigation to the foot of Section 3d or Percy Landing, which place is by nature calculated for the reception of any number of vessels, from its extended Bay (Trent Lake) and the secreting coves issuing from it.

Lock No. 1.

*By nine Dams and 12 locks.

From this point to Crow Bay (termination of section 3d) a distance of 12½ miles, the river does not, upon the whole, afford such opportunities of improvement by damming, particularly the first 1½ mile. From Percy Landing at point A (being the deepest and most convenient spot for leaving the river) the navigation must follow a collateral cut along the West shore in suitable excavation, until reaching Myers' Mill pond, as shewn on the plan, rising 23ft. 8, 8, by 2 Locks of 12 & 13, 7 and from which, until reaching Wilkins' Mills, a distance of 2 3-8 miles, the river, from the fortunate circumstance of being divided by a long Island, extending from Percy Landing, offers every facility that could be wished, as the whole of the water can be turned down the back or main channel during the excavations from the bed of the river, which must be lowered at the different points, as shewn on the Section, to save raising the dams to an inconvenient height, and consequent embankments, the banks for the greater part (to the head of Long Island) being rather low—then from Myers' mill the navigation will be carried to the foot of the Big Falls or Wilkins' Mills by 2 locks, 2 dams, and the different excavations from the bed the river.

From the waters immediately below the Falls, which are of sufficient depth, and only require to be deadened by the Dam, head of Long Island, the line of navigation must leave the river until reaching the Table Rock rapids above the Falls, or to Wilkins' boom, a distance of 1430 yards, for which purpose, as favourable an opportunity presents as could well be conceived, along a natural hollow or ravine, coursing by the rear of Mr. Wilkins' house and leading nearly to the point where it is intended to rejoin the river, at this place three combined and two detached Locks will be required to carry the navigation over the Big Falls, their contributary rapids and table rock chute, into the river above the boom, making a rise of 39 ft. 11 in. chiefly through favourable excavations.

From hence to Crow Bay the river presents every opportunity for improvement with the exception of the Crow Bay or middle rapids, at which point a collateral cut from No XXVII, at the foot of these rapids to No. XXIX. foot of Crow Bay, will be required with 3 locks, through rock excavation of well bedded limestone; from the Boom to this point (XXVII.) requiring (comprehending the still water at Major Campbell's) 2 locks and 3 dams, the whole rise being 58 ft. 5 in. 3 from Wilkins' Boom to Crow Bay, with the increased head on the Bay necessary to cover a table rock to the requisite depth.—This section from Percy Landing will cost £113,714 13 4, which brings the line to the Forks at the foot of Heeley's rapids, where commences section No. 4, which rising 72 ft. 9 in. 5 in a distance of 1½ miles, I propose surmounting by 8 locks 3 dams and 220 yards of excavation, as shewn on the section for this place, in the following manner, viz.:—At or near the Forks, by the construction of 3 dams 14, 13 & 13 feet in height by 180 feet in width with 3 locks of 9 ft, 6 in., 8ft., 8 ft. lift, which will back the water into what may be termed Entrance Bay, at the foot of Heeley's Falls, from which point in a direct line to the summit water of the *Long Reach*, a ravine leads, in every respect calculated to assist in overcoming the difficulties on this important station, and which may be accomplished by the construction of one detached, three combined, and one regulating Lock, making a total rise with the increase of head on summit level of 76 ft. 11 in. 5 pts. requisite as afterwards will be shewn, and will cost in all £32,892 2 5 bringing the navigation into the 14 Mile Reach, on which however there exists three different impediments to more than 18 inches draft of water, and which are tinged on the general plan amounting in all to 4 ft. 2 in. perpendicular rise, which, together with the complement of water required over the Upper Shallow (say 3 feet) make a total of 7 ft. 2in. The surmounting these, I had in contemplation to accomplish by part excavation, and to have towed up Craft by a Machine suitable for the purpose, but after taking into account the comparative trifling damages which would arise, from raising the level of the Long Reach, and the facility of doing so at Heeley's Falls, the adoption of the latter measure, would seem the more advisable, and which is intended to be effected by a dam across the table rock at the summit of Heeley's Falls of 13 feet in height and

320 in length, at an expense of £750 which at the same time will effect a material saving in the rock excavation, from the summit level, head of the Falls, to the guard Lock, and which being wholly rock, will more than compensate for the construction of the dam. To last section, the 5th, the navigation in now brought by the last named dam, backing the water to Crooks' rapids, where a similar obstruction to the rapids at Chisholm's occurs: the natural rise being 8 ft. 2 in. and the rapids running over a continuation of table rock, with at the time of inspection only 9 inches water, and at lowest water nearly dry.

To overcome these, as well as to ensure a sufficiency of water over the rocky shallows between Asphodel Bridge and Rice Lake, I should propose the construction of a dam across the river below the rapids, at a convenient site, which shall be of sufficient height to throw 5 feet water over the now lowest portion of the table rock, on which there is above the mill, 1 ft. 4 in., and from which, excavating a few beds, say to 2 feet in depth for a short distance, will leave a permanent increase of level at and above Asphodel Bridge of from 1 ft. 8 in. to 2 feet, sufficient, I believe, to cover the rocky shallows above, and which in consequence, will raise the general summit level of Rice Lake, allowing for difference of current from the lake to Asphodel Bridge, at least 1 ft. 8 in. above the lowest water, which would, I presume, be attended with no serious inconvenience but probably a benefit.

	£	s.	d.
	7062	9	10

Thus may the different obstructions to the free navigation of the River Trent be overcome and rendered available for the passage of steam vessels drawing 5 feet water, 110 feet over all by 32 feet beam, viz. by section 1st, from the mouth to the Widow Harris', nine miles, rise 116 5 9, by the construction of 13 locks, 9 dams, and two collateral cuts, 1st 432 yards in length, 2nd 770 yards in length.

	63683	3	10½

Section 2.—From Widow Harris' to head of Chisholm Rapids, about 6 miles, rise 8 ft. 7 in. 8 by a wing dam at Widow Harris' to drown the shallows above Lewis Bush's, and by one lock and 1100 yards rock excavation at Chisholm's.

	13814	7	6

Section 3.—From Chisholm's to Crow Bay, including Percy Reach, by a dam at Chisholm's to cover the shallows at the Government place, by 2 locks and 1½ miles of excavation to Myers' Mills, 2 locks, 2 dams and excavation from the bed of the river to Wilkins' Mills or Big Falls—thence 3 combined and one detached lock and a guard lock, with ¾ mile excavation to Wilkins' Boom, thence to Crow Bay by a dam across the river above the boom with 5 detached locks, with their respective excavations from the bottom of the river with a collateral cut from 27 into Crow Bay, 1100 yards.

	113714	13	4

Section 4.—From the foot of Crow Bay, by a dam across one of the outlet channels to cover the table rock sufficiently—to the forks or foot of Heeley's rapids by 3 dams and 3 locks to Entrance Bay (foot of Heeley's Falls) and by one detached, 3 combined, and 1 guard lock with their excavations and cut of 220 yards through chiefly limestone rock to the summit of the Long Reach.

	32892	2	5

Section 5.—From Heeley's Falls to Rice Lake, by the construction of a dam at the head of Heeley's Falls to drown the three intervening rifts 42 ÷ 30 or shallows above, and to back sufficient water into the lock at Crook's Mill, by the construction of one lock and dam con there, to cover the rocky shoals above together with considerable rock excavation above, and under water.

	6420	9	00
	642	0	10
	£7062	9	10

Including for lock houses £1320 0 0

All of which may be accomplished for the sum of £233447 6 11½ *H. Cy, in* 4 *years from commencement.*

Having thus endeavored to lay before Your Excellency what occurs to me, after two months of constant investigation, the mode by which the River Trent may be rendered navigable; it may, perhaps, not be out of place should I endeavor to lay before Your Excellency a few of the advantages likely to accrue from the fulfillment of such a measure, not only to the country immediately contiguous, but to regions beyond, thereby relieving them from the land locked predicament in which they now are and must remain, unless relieved by some such expedient.

To the country immediately bordering on the river, the advantages are too apparent, from the harrassing inconvenience experienced in dragging every species of commodity and provisions required for the many wants of new settlements through, perhaps, the worst roads in the Province, and obviate the many heart-rending scenes of endurance, scarcely to be credited but by an eye-witness.

To Government, the benefit must come more immediately home, in the increase in value of the many thousands of acres on, and contiguous to its banks and contributary lakes and streams which, on all hands, (and by people much more conversant with the true estimation than I can be) is admitted, must rise at least 100 per cent the moment these operations shall commence.

The facility for the transport of Lumber from the waters above, and from the different manufacturing establishments now existing, and which must soon double, will form a very prominent feature in the advantages likely to follow. The Tolls upon which will be cheerfully paid, and that dangerous business of "driving the river" to the destruction of much valuable property, and loss of human life among the "wicked" Rapids, obviated, and have no doubt, from all the information I have been able to collect, will, the first year yield £6,000.

To this add the still more incalculable benefit this Province would derive from the Marmora iron works being set in operation, which being situated on Crow River, (which in conjunction with the Trent I also inspected) only nine miles from where the line of communication passes in Crow Bay, a fine navigable stream with the exception of three ranges of rapids, each of which admit of easy improvement, and which I have reason to believe would be commenced so soon as the prosecution of the Trent should be decided upon.

From these works the Falls would also be considerable.

To new settlements to the North, and around the Rice Lake, Otonabee River, and Lakes beyond, what an incalculable benefit would accrue from the improvement in contemplation; necessitated now to drag from Lake Ontario all the many wants for their infant settlements at exorbitant rates, over a hill and dale road to Rice Lake, there shipped on board of a Steam Boat for Peterboro' established nearly two years ago by an enterprising individual (J. G. Bethune, Esquire, of Cobourg) there unloaded and conveyed again nine miles by land into another Steamer (belonging to the same individual), thence by varous portages to their different destinations. When the Trent shall be rendered navigable, the Settler and Merchant may have their goods shipped under their own eye at Montreal wharf, pass along the Lachine, Ottawa River, and canals at Carrillion, Chute Aux-Blondeau and Grenville, along the Rideau Canal, up the Bay of Quinte, along the Trent navigation, Rice Lake and to Peterboro' without ever once being disturbed after leaving the Montreal wharf, to say nothing of the diminution in freight, which must, as a matter of course follow—and on the other hand it requires no stretch of imagination to anticipate all these settlements in a few years contributing materially towards the export Trade, and that Wheat, Pot Ash, Staves, &c., must be re-shipped as return Cargoes.

Another and by no means the least consideration, to induce the *early* adoption of such a splendid scheme and rational measure, should be the consideration of the fact, that the navigation carried into Rice Lake is, comparatively speaking, the communication carried into Lake Huron, as appears evident from all the information I have been able to collect (not having visited those quarters), as to the obstructions existing between Peterboro' and Lake Huron, and which, although not coming within the immediate sphere of my instructions, I have the honor to submit for your Excelleney's information, as collected from my intelligent guide, John Harris (an Indian Trader).

1st. From the Otonabee River to Mud Lake, excavation 7 miles.

2nd. Thence into Chemong, Buck, Pigeon and Sturgeon Lakes, rapids 1 mile.

3rd. Into Cameron's Lake, rapids ½ mile.

4th. Into Balsam Lake, rapids 1 mile.

From thence to Lake Simcoe, 18 miles by land, making the total Canaling from Rice Lake to Lake Simcoe, 27½ miles, then into Lake Huron down the Severn (I believe the difference of level is somewhere about 70 feet).

Taking all these into consideration, connected with the immediate local advantages which must, as a matter of course, follow the improvements now in contemplation; the key to all those regions beyond, and viewed in connection with the Ottawa and Rideau navigation already in operation, and those in contemplation by the back of the Island of Montreal, the grand desideratum of an internal water communication from the Atlantic or Gulf of St. Lawrence to Lake Huron, ought certainly to have some weight in interesting the Mother Country in furthering such an undertaking: that is, if the Provincial funds should not be adequate within the 4 years of execution (which, however, is somewhat out of my sphere), but I believe I may safely assert, without the fear of contradiction, that there is not a landholder between the Trent's mouth and Lake Simcoe but would cheerfully submit to an annual tax on his lands during the execution of the works, to assist in defraying the expense; and if such a measure were properly digested and arranged, I have little doubt but as an alternative it would meet the general feeling of the District, and tend to facilitate the undertaking.

From the preconceived magnitude of the undertaking, the short time from necessity available to accomplish the whole during the lowest pitch of water, and to enable me to give my exclusive attention to the levels and localities of the river, I found it indispensable to engage the services of a Provincial Surveyor [Mr. Rubidge of the Newcastle District] in whom I found, throughout the whole of the arduous duty, much perseverence and attention, and in the necessity of which engagement, I trust your Excellency may concur.

In submitting the foregoing as the result of your Excellency's commands, I trust I may have succeeded in laying the matter before your Excellency in a comprehensive light.

I have the honor to be,
Your Excelleney's
Most obedient and
Very humble Servant,
N. H. BAIRD,
Civil Engineer,
M. I. C. E., L.

Amount of estimate for locks of substantial rough masonry as per detailed estimate with wooden dams.....	£233447 6 11½
Locks, 134 x 33 x 5 feet water.	
Estimate for locks of dimensions similar to the Lachine Canal.....	195300 10 0
Difference.....	£38146 16 11½

REPORT

By

N. H. BAIRD,
M.I.C.E.,L.,

On the Most Eligible

ROUTE FOR A C

Between

LAKE SIMCOE AND RIC

And

BAY OF QUIN

REVIEW STEAM PRESSES, PETERBOROUGH

REPORT

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M.I.C.E., L.,

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