

**FILE 554**

**ST. LAWRENCE RIVER**

**WATERWAY**

## CANADA

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## INTERNATIONAL JOINT COMMISSION

OTTAWA, CANADA

## UNITED STATES

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Private

December 17th, 1924

Dear Sir Arthur,

I was very glad indeed to receive your letter of the 12th. Mr Greenfield has left for the west. We are to exchange views in reference to colonization, or rather on the scheme that is to be put forward, and I hope before long to have it in shape.

Meanwhile I am taking the liberty to send you some material that I prepared last June and intended for the Young men of the country. It has never satisfied me and while I have circulated it to a limited extent, I have not made up my mind as to whether I should put it in pamphlet form and give it a greater circulation, more or less privately.

In it you will find some ideas that I put forward when we were together in Montreal a few days ago. My authority for the comparison of developed wealth in Canada and the United States I also enclose, and being statement I drew from Ottawa and Washington, in which you will observe that the wealth of our three prairie provinces is one-fortieth of the total wealth of the United States.

I also stated the other day that I went into the west in 1878, or forty-six years ago; that one million dollars I believed would have paid for everything from the Red River to the Rocky Mountains, so that the wonderful progress that has been made has all taken place in the comparatively short period of forty-six years. I would appreciate your returning these enclosures. The material for the Young Men is my last copy. It might be desirable to have it edited and distributed in pamphlet form.

I would like to have had more time when in Montreal to develop the subject of Canadian trade. The two great markets of the world are those of the United Kingdom and the United States, because the wealth of the world is largely centred in both countries. I am told that our neighbours produce everything that we produce, but that is not altogether correct because we have the hard wheat which they do not grow. Admitting that it is correct, if Canada is to be kept out of their markets on that account, it will keep every other country of the world out also.

The United States is a combination of some 49 states with a tariff wall around them, and the utmost freedom of trade amongst them; they can manufacture and practically produce within their wide area most of the things that can be manufactured and produced in the rest of the world. The same thing is equally true of our own union, but we do not seem to get very far in developing inter-imperial trade. In dealing with our neighbours in the matter of trade, it is a matter of barter, while with the United Kingdom, it should be approached from the point of view of maintaining the integrity of our commonwealth.

I hold that the work of this Commission in its report upon the development of the St Lawrence River, is one of the greatest things that has been done for Canada in recent years. Now I know that that is not the point of view in Montreal. My idea is that our report has given Canada that opportunity which is necessary in bartering for an expansion of our trade with the United States. In other words, it is the agency for bartering which Canada might very properly employ.

I believe in a reasonable tariff for Canada. Canada is not the pace-maker in tariffs. That is the privilege of her neighbour. I do not think, however, that the pulling out of the few bricks in the tariff wall by Mr King is in any way responsible for Canada's unsatisfactory position to-day.

We are at the present time sending into the United States about \$600,000,000 yearly for the products of that country, while it is sending us roughly about \$400,000,000 for ours. \$200,000,000 of the latter is for lumber and wood products. The average Canadian lumberman will tell us that in twenty-five years our timber resources will have been pretty well exhausted, not so much on account of the activities of the lumberman but through the ravages of forest fires.

Provincial governments are being forced to the four corners of their provinces to collect revenue, and in order to meet their expenditures they are unable to return to the forests a sufficient proportion of the money that they take out of them in order to safeguard them from destruction by fire. In consequence the annual loss is measured in millions. Unless that policy can be changed, in twenty years we will have to send something else to our neighbours, otherwise the balance of trade against us will be more than it is to-day.

Returning to the question of tariff, the United States does not seem to have any fixed principle. They tell us if we allow their coal to come in to this country free of duty, they will allow ours to go into their territory on the same terms. Then they go to the other extreme and adopt an adjustable tariff in respect to our wheat, which allows the President to raise or lower the bars as he sees fit. We have in western Canada considerable discontent over railway freight rates. We have more or less discontent in the Maritime Provinces. My point of

view then is that as the Government at Washington is from all appearances keenly anxious to have the St Lawrence River opened up between Montreal and Kingston, that Canada might very properly say "we have burdened ourselves to the very limit in the matter of transportation. We have no need of the St Lawrence development at the present time. We appreciate however our responsibilities as a neighbour and we are willing to meet you in this matter along the lines of the report of the International Joint Commission, provided you, in the same spirit of good neighborliness, do what should be done, so far as practicable the world over between fair-minded people, namely, enable us to sell to you enough material with which to pay you for those things we take from you.

Not only has the balance of trade been running against us about \$200,000,000 a year for the past six years, but we have to send the United States vast sums of money, being the interest on loans from that country. What is in my mind then is that the United States should allow our wheat and meat in Western Canada, the freedom of its markets, and likewise allow our people in the Maritime Provinces and Quebec for that matter, the same privilege. I see the difficulties in the way. The United States might say that it is impracticable but it would probably force that country to come forward with a counter proposition, provided they really want the St Lawrence route opened up.

If Canada could arrange for an entry for the Prairie Provinces into the markets of the United States, it should remove the dissatisfaction of the agriculturist of the middle west, and the Maritime Provinces should take on a new lease of life if the United States markets were open to them. I realize our railways would probably object, fearing the diversion of traffic to our neighbours, but the increased growth of the country would soon overcome any losses that might occur as the outcome of such an arrangement.

Now a few words about the Commission's report on the St Lawrence. If you look at the situation at Sault Ste Marie, you will find three or four canals on the American side, and one on the Canadian side. Why? Because the United States has at least four times the traffic of Canada. Each country owns its own canals, operates them and controls them. There is no toll on traffic, yet toll is paid by way of interest on the increased national debt that each country bears in connection with the construction of those waterways.

The principle laid down in our report and which may not be as clear as it might be, is as follows: that each country shall own the structures within its own territory and to operate and control them, with a certain measure of international control on account of the toll that each country will be called upon to pay in connection with the commerce using the waterway. Off-hand I would say that in respect to the entire cost, sixty per cent would be spent on construction in Canada, and forty per cent in the United States. This disparity is due to the fact that in addition to constructing the international works, it will be necessary to deepen the channel between Cornwall and Montreal - entirely in Canadian territory.

In respect to the burdens that each country would bear, first let me say that within the area tributary to those waters, in the United States, the population has been estimated as low as twenty million and as high as forty million. The total population from Cornwall to Edmonton is about five million. It takes people to produce and the wealth produced on the area on each side of the line, probably bears the relation of 20 per cent in Canada to eighty per cent in the United States.

The principle that our Commission laid down was that the cost to the two countries should be in the ratio of the commerce passing through the canals by each country. Then we took the ground that that cost should be in the nature of a toll made up of the interest on the capital investment of each country, plus the operating expenses, plus the cost of repairs.

Let me put it in another way. Take the highway from Montreal south to the international boundary. We can imagine a condition in which the liquor laws of the Province of Quebec would draw a very heavy traffic from south of the border. Supposing the province decided to put a toll gate on the road, the amount of toll would be determined with the object of obtaining therefrom at the end of the year, an amount sufficient to pay the interest on the road improvement, plus repairs, etc. We can imagine a situation wherein possibly 90 per cent of the traffic would come from the United States for the reason mentioned above. No one would suggest that the users of the road would have any right of ownership, or of control. That is the situation in respect to the Commission's recommendations re the St Lawrence canals.

As stated above, the population on the United States side, tributary to these international waters, is anywhere between twenty and forty millions, while on the Canadian side, it is not more than five million at the most. Everything points to the fact that the normal use by the two countries would be one-fifth for Canada and four-fifths by our neighbours.

Assuming for a moment that the two countries were under one political control. The St Lawrence would be deepened, that which I have referred to as a toll, namely the interest on the investment, plus the repairs and operating expenses, would be taken out of the annual revenues of the entire country. We all know that Canada's revenue is about one-twelfth of that of the United States, so there again you see the proportion that would be paid by the people of this country towards the development of that waterway would probably be less than twenty per cent.

In our Commission's report we said there were enough known factors (those that I have just been reciting) to determine the proportion that each country should pay for the use of the improved waterway, and that those proportions should continue in effect for five years after the works were completed - probably fifteen years hence. It seems to me that Canada would be justified in saying to her neighbour - we are embarrassed to a much greater extent than you are by taxation. We want that proportion - probably not exceeding twenty per cent for Canada, to be in effect for twenty-five years. We believe that the ratio of use by the United States will be in the neighborhood of that just stated. You would not be so urgent about the development of this waterway if you were not convinced that your people would use it. We cannot afford to take any chances in the matter, until say twenty-five years, when our tax burdens should be much lighter. Therefore we consider that Canada should not be called upon to pay more than twenty per cent at the most, of the total, for twenty-five years. If at the end of that time, the commerce that has used it, indicates that Canada has paid too much, you, the United States, should make good to us the difference, spread over a term of years thereafter. On the other hand, if you - the United States, have paid too much, Canada should refund you the excess by annual payments.

and adjusted every five years thereafter based upon the Commerce of each country using the system during the preceding five years.

toll

Please bear in mind that our Commission, included the Welland Canal in our suggestions. Some years ago the city of Toronto was strong in the councils of our country and we woke up one morning and found that Canada was committed to the enlargement of the Welland Canal, which when completed will have cost us nearly \$100,000,000. If what I have already said as to the proportion of the toll that each country should pay is sound, then Canada would receive a credit of the interest on about eighty per cent of that expenditure. The superficial way in which the whole matter has been considered by our press and others gives the impression that Canada cannot go into the St Lawrence development except on a fifty-fifty basis; that we cannot allow the United States to have any ownership or control over works within our own territory. Nothing of that character was suggested by our Commission, and it would be unwise even to talk about a fifty-fifty basis because the heavy expenditure will be in Canada, and if our neighbours were to put up fifty per cent it would make them owners of a certain proportion of the works in Canada.

of the actual cost

Now I come to the question of what I regard as sound national policy for Canada. I consider that our Government should frankly say to the Government at Washington: "We are over-burdened through developing a transportation system far beyond our present requirements. We recognize our duty to you as a neighbour; we are willing to join you in the development of the international section of the St Lawrence, and to enlarge the waterway in the national section between Montreal and Cornwall in order to enable you to increase your trade, but we consider we are justified in asking you to enable us to enlarge our trade in your country so as to meet the heavy obligations our people have to pay to

your people, and while I am not competent to state the best means for accomplishing that, it has occurred to me that we should endeavour to quiet that western cry about a freer entry into the United States markets, and the same cry of the Maritime Provinces. I consider Canada should very frankly say to our neighbour, that unless you can do something for us along those lines, we regret to say that we cannot take any additional financial responsibility at the present time in order to meet your wishes in regard to the St Lawrence canals.

At the present time an effort is being made to export power from Carillon on the Ottawa river. Fifteen years ago I was publicly stating that it was unwise to export our raw power. I seemed to be alone in the wilderness at the time. Now I notice in the press considerable opposition to such a policy. On the other hand I have modified my views to this extent - we should scientifically determine what surplus power we will have during say the next twenty years. If we can spare power for say twenty years, I would be disposed to say to our neighbours, you may have this on condition that we can recall it in blocks of 10,000, 20,000, or say 50,000 horse-power beginning at the end of twenty years by giving one year's or five year's notice thereafter. I think, however, that our government should not deal with the individual companies that wish to export the power. It should be an arrangement with the government at Washington and again I would take the attitude of the trader.

*alone*

We have in my judgment very good neighbours but the tendency will be so far as they are concerned, to say that which we do for you nationally, you must do for us, and Canada is too small yet to protect herself on any such policy. My firm opinion is that our Federal government should keep a very full measure of control of our electrical power and not allow it to be exported except through a clear and distinct understanding with the Federal Government at Washington so that if we decide later on to retain that power at home, it will be in accordance with a clear cut arrangement made with the national government of the United States. Otherwise the exporting of power may lead us into trouble with that country. I repeat again, our action in that matter should be the part of a trader in order to further the trade of this country.

Now a few words in respect to our trade with Great Britain. You may remember at the meeting the other day I said that I would like to see a small commission appointed, called upon to inquire into world trade for Canada. I would like an outstanding English financial man, and one very close to the premier of Great Britain. As we are going to-day, I believe that twenty years will see us so far down the stream that the current will control us, and we will pass over to our neighbours. I do not want to say that in public; I know there is no necessity to think it if we can only pull ourselves together. I hold that the investigation would lead those men to realize pretty clearly Canada's growing dependence upon the United States, and I believe the Englishman on that commission would very shortly afterwards

reach the Premier of Great Britain and make it clear to him that Britain should take a keener interest in Canada to-day than in any other of her overseas dominions; leading to greater activity in colonizing this country and greater British effort in our development.

I made the statement above that the report of the International Joint Commission may not have been very clear. May I explain what I meant. In our earlier years it was our custom to have two members, one from each country, sit down and write the report on any matter we were dealing with. I remember some years ago spending ten days in Toronto with an American colleague endeavouring to prepare a report. His fear was that I was trying to embody principles that might be favourable to Canada later on, and I had pretty much the same view in regard to his efforts. Later on we discovered that we had in the Canadian Secretary, Mr Burpee, a trained writer, and we adopted the policy of deciding principles and calling upon Mr Burpee to prepare a report. Even in that case there are difficulties because while a report prepared by one man is fairly clear from one end to the other, when we have six men around a table, one may drive a dent into the report on one side, another a dent into it on another side, and the principles that the writer was bringing out, may become more or less clouded.

I know for instance that one of your Montreal papers claimed that the Report called for international control. What we had in view was this: that if for instance, the United States has to pay a toll for the use of its commerce in our canals between Cornwall and Montreal, the charge might be made at any time that American vessels were not being treated on the same basis as Canadian vessels, and therefore the charge should be referred to an international body. That is the kind of control that was in the minds of our Commission.

Now please understand I am not out as an advocate on behalf of the development of the St Lawrence river. Speaking to you privately, I consider the Government is wasting our money at this time because we gave them an estimate of the cost prepared by the engineers of the two governments. Any work that is done by engineers now will still be an estimate. Probably the best way would be to take a dozen large public works, take the estimated cost, then the actual cost, find the difference between the two. The same percentage could be added to our estimate of the cost of the St Lawrence improvement.

We suggested to the two countries in our report, the apportionment of cost as stated to you above; in other words, we have given the two governments enough information to meet each other and see if they can determine upon an arrangement for carrying out the work. My mind is working always on the trade idea I have developed above and it seems to me that Canada should take the position of saying

*We also suggested a further engineering investigation before proceeding with the project.*

very frankly to the United States, if we cannot adjust this difference in trade, the best thing we can do is to forget about the St Lawrence. Instead of that, and speaking very privately because in the position I occupy it is not competent for me to criticize governments- I feel we are wasting \$100,000, the amount set aside for the present investigation of the St Lawrence, and after the money is spent the two governments will have to come to close quarters and determine what they intend to do.

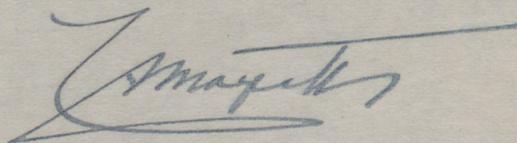
I feel I should apologize for writing you at such length. I have given you, however, some of the things that I would like to have had time to say when you were kind enough to have luncheon with me the other day. I feel that the world is settling down to business; that our neighbours have the ball at their feet and will make tremendous progress. What Canada needs to-day above all things, is a courageous public policy with something of the spectacular in it in order to bring confidence back to our people. We should create a great colonizing agency, making it clear to our people that the aim is to place 100,000 families on land "within a few years". I know that as we place people on land, we can enlarge our cities through increased population.

Canadians have reached a point where they are crying "wolf, wolf" to such an extent that if we are not cautious outsiders will commence to think that Canada is a country to be shunned. Hence I repeat, to bring this country into the limelight, we need some courageous development policy. My mind has been running along the lines above indicated.

With kind regards and wishing you the compliments of the season,

Believe me,

Yours sincerely,



Sir Arthur W. Currie, G.C.M.G.,

Principal, McGill University,

M o n t r e a l

P.S. Reading over the foregoing, I regret to find much reiteration. I hope you will not think I am critical of our neighbours. I have a very high regard for them, but I consider we should make more use of their markets.

I notice my statement that it is not competent for me, as a public servant, to criticize governments. As a matter of fact I have little desire to do so. I appreciate they will not break new ground with any courage without some public demand, hence my idea of "team play" as expressed at our luncheon the other day.

Henry Ford speaking some weeks ago, about the time of the recent Presidential election, referring to a government he was supporting and having within its membership some men of rare financial and business capacity, said in reply to a query as to whether he was going to renew his application for the Muscle Shoals site, said emphatically "no", in words something like the following in effect. "Life is too short to attempt to do business with governments. When you are ready you cannot put your finger on them."

ARCHDEACON SCOTT  
QUEBEC

## INTERNATIONALIZING OF THE ST. LAWRENCE

To the Editor of The Gazette:

Sir,—Everything is ready now on the part of the United States for the turning of the St. Lawrence River into a great international waterway to the Great Lakes. The President has given his approval of the scheme. The money can be easily raised and all that now remains is for poor little Canada to give her consent, and allow one of the greatest rivers in the world, ninety per cent. of the course of which lies in Canada alone, to become a joint possession with the wealthy and ambitious nation to the south. Cutting through the heart of our Dominion, the river, which is now ours alone, will henceforth, if the project is carried out, be only half ours. International laws, rights and the vested interests of another nation are going to grip our great national highway for all time. In short, Canada is selling the St. Lawrence, and all that the sole possession of so magnificent a natural waterway means in the future of our country. Are there no Canadians in Canada sufficiently interested in the building up of our young nation, and sufficiently free from the selfish and sordid occupation of "getting rich quick" who will give their attention to a transaction which is going to have deciding effect upon our destiny for all time? If we sell the St. Lawrence, we shall never be able to buy it back. It will be gone from us forever. The hundreds of millions of dollars necessary to the making of our river into an international waterway are going to come from the United States. We, with our huge national debt, have no money to squander in the dubious project. The money will come from the United States. The ninety per cent. of the purely Canadian river will come from us. The sole ownership of the river during that ninety per cent. of its course, will cease to be Canada's, and a joint partnership in its waters will be begun, so far as you can have a joint partnership between a wealthy and powerful nation who supplies all, or almost all, of the capital invested, and a small and poor nation who watches the manipulation of the river so that it may become tributary to the commercial greed of Chicago and the New England States, where the need of new sources of electric energy is so keenly felt.

What becomes of our new Dominion status, and the new aspirations inspired by it, if we begin to enter into joint housekeeping in the matter of our priceless river with the United States? It is about time that a strong nationalist sentiment in Canada put an end to the danger of foreign concessions in our young country. The internationalizing of a natural feature of such magnitude and potential significance as the St. Lawrence River stabs at the very heart of our sense of independence, and our hopes for a great future. It will not add to the amour propre of the old Province of Quebec to find itself looking down upon the waters of an American-made canal, subject to American interests and governed by international agreements.

We are in too much of a hurry in Canada to sell our resources to the first bidder. We must take our time and do our own business ourselves. We can do it. In the past sixty years of our federated life, Canada has done wonders and made long strides. I can remember hearing a little battery of guns in front of McGill College, Montreal, firing a royal salute on July 1st, 1867, when the Act of Confederation was signed. The new-born baby Canada was a small thing then. But I can remember in France, on the jubilee of our Confederation, July 1st, 1917, hearing the guns of the great Canadian Corps, firing their salutes of world freedom upon the enemy. Canada had achieved full manhood then. I shall probably not hear the royal salute fired which will herald the arrival of Canada's Centenary, but I want to be certain that it will be fired. We can only be certain that it will be fired, if we guard as a sacred trust for our descendants the absolute freedom of every acre of land and water in our national inheritance. Let that slip from us, by ever so small a degree, and our status, not only in the British Commonwealth of Nations, but our wider status among the nations of the world, is imperilled.

FREDERICK GEORGE SCOTT.

Quebec, January 20th, 1927.

*F. G. Scott*

March 31st, 1927.

Venerable Archdeacon Scott,  
St. Matthew's Rectory,  
Quebec, Que.

My dear Archdeacon:-

Thanks very much for sending  
me your leaflet about the St. Lawrence waterways.

You are absolutely right.  
More strength to your good right arm and to the  
pen it wields so effectively.

Come and see me some time when  
you come to Montreal.

Yours faithfully,

ALTERNATIVE WATER ROUTES

Lake Superior to the Sea.

1. Existing Water Routes.
2. Projects presently in course of construction:-  
Welland Ship Canal.
3. Traffic.
  - (a) Traffic movements.
  - (b) Capacity required.
4. Dimensions of a ship Canal to serve the area in question.
5. Alternative Routes.
  - (a) The Georgian Bay Ship Canal.
  - (b) U.S.A. Alternatives to the Welland Ship Canal.
  - (c) Lake Ontario to the Atlantic -
    - i. The Oswego-Hudson Ship Canal;
    - ii. The St. Lawrence Waterway;
    - iii. The Ottawa-St. Lawrence Routes;
    - iv. The Lake St. Francis-Lake Champlain-Hudson Route.
6. Summary of alternatives.
7. Comparison of St. Lawrence and Oswego-Hudson Routes.
  - (a) Time of Transit;
  - (b) Economics in transportation;
  - (c) Costs of construction and operation.
8. Conclusion.
9. Comment.

1. Existing Water Routes.

- (1) St. Lawrence Basin above Quebec, 407,700 square miles, of which 58.4% is Canadian Territory and remainder U.S.A.
- (2) On North. Hudson Bay Basin - Divide 200 ft. above Lake Superior.
- (3) On South. Mississippi Basin - Divide less than 10 ft. above the level of Lake Michigan.
- (4) Hudson River Basin - South and East of Lake Ontario, Allegheny Plateau and Catskill Mountains.
- Western Pass Lake Oneida - Mohawk River.  
Adirondack Mountains.
- Eastern Pass Richelieu River - Lake Champlain -  
Hudson River. Green Mountains.
- Western Pass New York Central & West Shore Railways.  
New York State Barge Canal.
- Eastern Pass Delaware and Hudson Railway.  
Chambly-Richelieu-Champlain-Hudson  
Waterway.
- (5) Navigation on Great Lakes unrestricted. Limiting conditions of depth, width, curvature and current in short channels connecting them.
- (6) Lake Superior-Lake Huron. St. Mary's River-5 locks in parallel - maximum depth 24 ft. - Traffic 1923 91 million tons (which is over double Suez and Panama combined).
- (7) Lake Huron - Lake St. Clair - Lake Erie. Present depth 19.5 feet- 94.6 miles, of which 28.6 is submarine channel - no locks.
- (8) Lake Erie - Lake Ontario. Niagara Escarpment. Welland Canal - depth 14 feet - length 26.75 miles - Locks 26.
- (9) Lake Erie - Hudson River. Erie Canal - depth 12 feet nominal - 388.4 miles - 26 locks.
- (10) Lake Ontario - Erie Canal. Oswego Canal - 3 locks - 24 miles, thence 140.9 miles to Hudson River.
- (11) Lake Ontario to Montreal. St. Lawrence Canal - depth 14 ft. length 46 miles - total distance 180.5 miles - 21 locks.
- (12) Montreal to Sea. - depth 30 ft. - distance to Quebec 160 miles of which 63.3 miles is submarine channel.
- (13) Richelieu 7 feet, Chambly 6.5 feet. Hudson 12 feet.

2. Welland Ship Canal.

4 Single Locks.

Flight of 3 Double Locks.

1 Guard Lock.

each 850 feet long, 80 feet wide, 30 feet on sills.

Lift 46 feet. Total Lift 326 feet.

Channels 25 feet - new contracts 27 feet.

Can later be dredged to 30 feet - Total length 27 miles

Date of opening 1928.

Terminals Port Colborne and Port Weller.

Capacity 25 million tons. Season 225 days.

Costs to date \$62.5 million.

Estimated total \$115. (exclusive of interest).

Interest during  
construction. \$ 46.

Total. \$161,000,000

## 2. Welland Ship Canal (cont'd)

Estimated benefit to commerce - 40 cents per ton.  
On  $7\frac{1}{2}$  million tons - \$3,000,000

### Cost of Operation.

Interest $4\frac{1}{2}\%$ on \$161,000,000 -	\$7,800,000
Amortization $\frac{3}{4}\%$ \$161,000,000 -	805,000
Operation & Maintenance :	
$1\frac{1}{2}\%$ \$115,000,000 -	1,725,000
	<u>\$9,330,000</u>
Annual deficit standing alone over	\$6,000,000

Note. Rates for Amortization, Operation and Maintenance based on figures given by U.S. Board of Engineers for Oswego-Hudson. Interest at rate actually being paid by the Canadian Government.

## 3. Traffic.

- (a) Annual Movement Great Lakes to Atlantic Seaboard over 250,000,000 short tons.  
Presently interested in Waterway 15-30,000,000 tons.

In 1919 Railways south of Lakes incapable of handling traffic - relinquishment of Government control - more satisfactory conditions - margin of capacity still extremely small. In Canada railway development is still in advance of population and production.

Traffic is seasonal - waterway suitable for carrying peak loads - Cost of facilities by rail many times greater than Waterway and cost of transit higher in about ratio of 150-20.

- (b) Capacity required.

Initial at least 25,000,000 tons - must be capable of large increase later.

## 4. Dimensions of a ship canal to serve area in question.

Initial depth 25 feet preferably 27 feet and ultimate 30 feet. Length of locks 860 feet.

$27\frac{1}{2}$  feet will admit 87% of merchant tonnage afloat, and will only exclude large ocean liners and special purpose transports which would not use waterway in any event.

Channel width in cuts 220 feet, in submerged sections 450 feet. No curves less than  $\frac{1}{4}$  mile are permissible and at least 1 mile radius should be provided. No reverse curvature.

## 5. Alternative Routes.

- (a) Georgian Bay Ship Canal.

22 foot project 1908 estimated cost \$100,000,000  
27 locks - 28 miles canal - 66 miles dredging - 116 curves of which 39 are of about  $\frac{1}{4}$  mile radius - 2 reverse curves. Length 440 miles - rise to summit 689 feet thence fall to Lake Huron 98 feet.

"Amable du Fond" Watershed limits capacity to 10,000,000 tons per annum - could be increased at great expense by about  $\frac{1}{2}$ .

5. Alternative Routes (cont'd)

(a) Re-estimate on 27½ foot with locks similar to Welland - the cost would be over \$300,000,000.  
No saving in time of transit over projected St. Lawrence route, although 400 miles shorter - outflanks important traffic centres on Lakes Ontario and Erie.

(b) American routes Lake Erie to Lake Ontario.

La Salle - Lewiston - \$125,000,000 in 1925  
Tonawanda - Olcott.  
Buffalo - Olcott.

Not important in view of prospective early completion of Welland.

(c) Lake Ontario to the Atlantic.(1) Oswego-Hudson Ship Canal.

Route Oswego River-Lake Oneida-Frankfort, along Mohawk River to Schenectady - Norman's Hill to tidal Hudson a short distance below Albany - New York.

Low level project 19 locks from Lake Ontario at elev. 245.5 up to 379 thence down to tidal Hudson.

Crossings for 80 highways and 3 railways.

Estimated capacity 80,000,000 tons in 210 days.

Cost of 25 foot project with 30 foot locks \$517,200,000.

Estimated U.S. traffic 15,500,000 tons showing saving of \$22,500,000 plus \$8,500,000 on Canadian grain in bond.

Annual costs stated at \$30,360,000 (exclusive of Hudson River improvements) - No Power developments. Some doubt as to adequacy of water supply on height of land section east of Lake Oneida.

(2) St. Lawrence Waterway.(a) International Joint Commission Report 1921

25 foot channel - 30 foot locks and 1,434,000 H.P. on International Section	\$252,728,000
Subsequent deepening of channel to 30 feet	\$ 17,986,180
	<u>\$270,714,280</u>

From Lake Ontario at Elevation 245.5 to Montreal Harbour at elevation 18.7 - 7 Lifts and 2 guard locks each 860' x 80' x 30' on sills.

Canal	32 miles.
Dredged Channel	12.5 "
Natural "	136. "
	<u>180.5</u>

Power development on National Section separated from Navigation and costs not included.

(b) Joint Board of Engineers Report 1926.(1) Main alterations:

- i. International section - more complete Power development
- ii. Soulange Section - scheme for Power included and better arrangements made for navigation.
- iii. Lachine Section - new alignment to ensure minimum interference with land and water traffic of Montreal.
- iv. Increased but more reliable unit costs.
- v. Proposals for co-ordinated improvements of upper lake channels.

(2) Costs as now estimated.

	Million Dollars.			
Channel Depth	23 ft.	25 ft.	27 ft.	30 ft.
: Great Lakes:-				
: Connecting channels	-	41.1	54.9	75.9
: St. Mary's River Locks	-	-	6.5	6.5
: Compensating Works	3.4	3.6	3.7	3.8
: Welland Canal	114.5	114.5	115.6	128.6
: St. Lawrence River to Montreal (including works for 2,730,000 H.P. of which \$ will be installed)	344.7	350.1	355.9	374.5
: Total with 1,365,000 H.P.	462.6	509.3	536.6	589.3
: For 2,730,000 H.P. all installed add		44.0		
: For 2,500,000 H.P. additional add		225.0		
: Total with 5,280,000 H.P.		778.3		

(3) Points of difference between U.S. and Canadian Engineers.

U.S. favour 25 feet depth and single stage Power development at Barnhardt Island in International Section.

Canadian favour 27 feet depth as more suitable for existing ocean ships and double stage development in International Section as reducing area flooded.

Double stage in International Section would add about \$29.6 million to figures given in (2).

(4) Prospective traffic presently available.

U.S. Imports	4,826,000	short tons.
U.S. Exports less grain	5,718,000	" "
U.S. Domestic	9,635,000	" "
U.S. & Canadian grain	10,000,000	" "
Canadian - Import, Export and Domestic.	<u>2,000,000</u>	" "
Total	32,174,000	

(5) Annual benefit (based on 27 feet depth)

Estimated saving at 1.80 ton	\$ 58,000,000
Power Revenue 1,365,000 H.P. at 12	\$ <u>16,500,000</u>
	\$ 75,500,000
Interest, Amortization Operation 6% \$ 536,600,000	\$ <u>32,200,000</u>
Net benefit	\$ 42,300,000

(6) With the 25 ft. project the saving is estimated at \$1.60 per ton.

NOTE: With joint financing it is considered that the capital can be raised at not over 4%.

(iii) Ottawa St. Lawrence Routes.

(a) Head of Galops Rapids - Hawkesbury - Ottawa River increases total distance from 132 to 144 miles and canal from 26 to 75 miles.

(b) Via Ottawa - still longer by 30 miles and canal is 55 miles long.

490,000 Horse Power at Carillon.

Very expensive to construct either of these routes which would in any event impose serious delays to navigation.

NOTE. 1 Hour's delay on Great Lakes costs \$1,000,000 per annum.

(iv) Lake St. Francis - Lake Champlain - Hudson Route.

Level of Lake St. Francis at elevation 152.4 to Kings Bay on Lake Champlain a distance of 48 miles, there descending to elevation 100. Route follows Lake Champlain to Whitehall, thence a land line along Hudson to Waterford - 7 locks in all - numerous railway and highway crossings.

St. Lawrence water could be diverted to Hudson.

No route net in Canadian Territory physically feasible.

Very expensive and if constructed Canada could open a route to the sea by building a few miles of canal which would take all the traffic.

6. Summary of alternatives.

- (a) Georgian Bay. Insufficient traffic capacity - outflanks some of most important U.S. and Canadian traffic cities.
- (b) Champlain - Hudson - 300 additional miles of restricted waterways - deficient in traffic capacity - excessive in cost.
- (c) Ottawa Routes. 29 or 49 miles extra canals - excessive cost.
- (d) American alternatives to Welland. Unimportant at present in view of near completion of Welland - important only if U.S. should decide to build a national route.

7. Comparison of Oswego Hudson & St. Lawrence.

	: Ex. R. :	: Hours Differ-
World Market	: America :	: ence from Lake
	: Commerce: Key point :	: Ontario in
	: of Great :	: favour of
	: Lakes :	: St. Lawrence: Oswego
	: area :	: Hudson
: United Kingdom	: 32.8% : Liverpool :	: 57.3 :
		: (D) 61.0 :
: Baltic Ports	: 7.3% : Copenhagen: (E) :	: 51.3 :
		: Bishops :
: N.W. & W. Europe	: 17.2% : Hook :	: 31.3 :
: Medn. E. Coast of Africa		
: India & East Indies	: 10.2% : Gibraltar :	: 34.8 :
: Western America		
: Orient & Australasia	: 11.1% : Colon :	: 80.5 :

(continued over) /

7. (a) continued.

	EE.N.	Key Point	Hours Difference from Lake Ontario in favour of
World Market	America Commerce of Great Lakes area	St. Lawrence	Oswego- Hudson
West Coast of Africa	0.6%	St. Vincent	5.5
East Coast of S. America	4.1%	Pernambuco	24.3
West Indies and Central America	0.7%	Nassau	39.6
Gulf of Mexico	14.8%	Key West	94.3
N.E. coast of S. America	1.2%	Barbados	51.4

(D) North of Scotland (E) English Channel.

(b) and (c) Economics in transportation and cost.

	<u>St. Lawrence</u>	<u>Oswego-Hudson</u>
Present Interested Traffic	32,200,000 tons	15,500,000 tons
Net Benefit to Commerce & Power	\$35,800,000 minus	\$ 4,360,000 (1)
Power Development included	1,365,000 H.P.	nil.
(2) Cost (including upper Channels )	\$509,200,000	\$676,400,000

(1) for Oswego Canal alone and allowing nothing for cost of upper lake channels and Hudson River improvement.

(2) 25 ft. project in each case.

8. Conclusion.

"Of the various alternative routes from the interior to the seaboard, none offers advantages comparable with those of the natural route by way of the St. Lawrence".

9. Comment.

*Jan*

B...

ALTERNATIVE ROUTES FROM  
THE GREAT LAKES TO THE SEA.

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1. Within the next two years the opening of the Welland Ship Canal will give the extensive shipping (1) of Lakes Superior, Huron, Michigan and Erie, which has been developed on a basis of 22 foot draft, access to Lake Ontario from which it is presently excluded by reason of the small locks (2) of the existing Welland Canal.
2. The alternative outlets for traffic to the seaboard which will then require consideration are -
  - (i) The St. Lawrence Route.
    - (a) The proposed St. Lawrence Ship Canal;
    - (b) The present St. Lawrence Canals;
    - (c) The Rail Route.
  - (ii) The Oswego-Hudson Route.
    - (a) The proposed Oswego Hudson Ship Canal;
    - (b) The present Oswego-Erie Canals and the Hudson River;
    - (c) The rail routes from Oswego to the Atlantic seaboard.

NOTE (1) In 1928 there were 767 vessels with a gross capacity of 4,480,817 tons, of typical dimensions 600 feet long, 60 feet beam, 21 foot draft, and carrying capacity 12,000 tons gross engaged in trade on the Upper Lakes.

(2) The typical vessel navigating Lake Ontario and the St. Lawrence is 253 feet long, 43 feet beam, 14 foot draft and has a carrying capacity of about 2,800 tons gross. It is necessarily higher powered and more expensive in construction and operation for given loads than is the Upper Lakes.

(1) (a) The proposed St. Lawrence Ship Canal.

(for description, costs, estimated traffic, and economies see Section 5 (2) of attached paper wherein it is shown that the net benefits to commerce by lowered navigation costs and without taking account of revenue from power considerably exceed the costs for interest, amortization and operation)

This project, in one section, is International in character and it cannot be constructed without agreement between Canada and the U.S.A.

Certain alternative routes joining the St. Lawrence at Prescott to the Ottawa have been explored, but they are impracticable on grounds of excessive cost, deficient capacity and increased hazards to navigation. Similar considerations rule out the project for the Georgian Bay Ship Canal, the capacity of which, apart from other inherent limiting features, is restricted to not over 15,000,000 tons per annum by the available water supply on the height of land section between Lake Nipissing and the Mattawa River.

(b) The present St. Lawrence Canals.

In 1927 these canals handled about 6-3/4 million tons of traffic and the congestion and delays which were experienced showed conclusively that the practical capacity was about reached.

To reconstruct this system to permit passage to the large lakers on the basis of side canals would be vastly more expensive than to improve the river for navigation and power as contemplated in the St. Lawrence Ship Canal project, and it is doubtful whether this would be physically practicable without the consent of the U.S.A. to the raising of certain water levels as required by the Treaty of 1909.

Under the circumstances envisaged the use of the existing St. Lawrence Canals entails a transfer from the large lakers at or about Prescott and the re-transfer to ocean going ships between Montreal and Quebec. The estimated costs of this water borne transfer in comparison with a rail movement show little, if any, economy.

(c) The rail route.

The cost of transfer to rail at the foot of Lake Ontario, of movement to Montreal, and of re-transfer to ocean going ships there is estimated to be approximately the same as a similar transfer from Oswego to the Hudson.

(11) (a) The proposed Oswego-Hudson Ship Canal.

(for description, costs, estimated traffic and economies see section 5(1) of attached paper wherein it is shown that the costs far exceed the possible benefits to commerce and where it is also pointed out that there are no additional benefits, as in the St. Lawrence, to be derived from power which has consequently been made available.)

The route of the Oswego-Hudson Ship Canal is entirely within the United States, as is also the area from which the supply of water for lockage will be derived. It can be built at any time at the option of that Government without the necessity of any international agreement whatsoever. Large projects are presently in hand for the development of port facilities at Oswego and at Albany to which point the Hudson River is being improved for navigation on a basis of 27 foot draft by ocean going craft.

(b) The Oswego-Erie Canals and Hudson Route.

The existing locks and canals are capable of handling barge traffic only on the basis of 12 foot navigation. The present traffic movement amounts to about 3 millions of

tons and could perhaps be doubled without undue congestion and delay, and even at this it represents but a small part of the 250,000,000 tons which moves annually between the Great Lakes region and the Atlantic seaboard.

(c) Rail Routes Oswego to Atlantic Seaboard.

The Pass between the Adirondacks and the Catskills through which the Mohawk River and the Oswego-Hudson Canals run, also provides passage for the New York Central and West Shore Railroads, two highly developed systems with extensive connections not only to the upper navigable reaches of the Hudson River but also to New York and to the principal other United States ports on the Atlantic seaboard.

It is these railroads which present the practicable alternative to the St. Lawrence Route, and with the port facilities now being constructed at Oswego and on the Hudson for handling immense volumes of freight at low unit costs it has been estimated that the economies to be effected in the vast movements of traffic between the Great Lakes and the Atlantic will nearly equal those possible with the St. Lawrence Ship Canal, and will certainly exceed those of the existing Rail and Water routes along the St. Lawrence; nor is there any physical limitation, as with the Oswego-Hudson Ship Canal, to the quantities which can be handled across this gap by rail.

3. The situation as it presents itself is this: the hopes of the United States citizens in the region of the Great Lakes are now centered on the sentimental objective of having ocean going ships arriving at their ports and on the movement of their external trade without breaking bulk. Mr. Hoover, the President of the United States, has been elected with this in view and is committed to proceed as soon as the necessary agreement with Canada can be negotiated.

New York State in contradistinction to other parts of the U.S.A. fears the diversion of traffic from New York and favours the construction, even if it be not economical, of the Oswego-Hudson Ship Canal to satisfy the aspirations - perhaps mistaken - of the Upper Lake States.

4. In two years at the latest, with the opening of the Welland, bulk freight will be arriving at the lower end of Lake Ontario and will find an outlet, a little more than at present by the existing St. Lawrence canals and rail routes, some millions of tons additional by the Oswego-Erie Canal, but the bulk by the New York Central and West Shore Railroads which are already equipping in anticipation.

Once this avenue of traffic has been opened and developed there will be little chance of rediverting it to the valley of the St. Lawrence, and for all time to come the Canadian as well as the United States mid continent will remain tributary to the Port of New York.

5. It so happens that the views of the present Government of the United States correspond with the best interests of Canada but if we fail to act the situation will change and once lost we will not likely ever have an opportunity to remove the physical barriers to navigation presented by the International Section of the St. Lawrence.

6. If the St. Lawrence is developed the trade of the mid continent goes out through our ports to the incalculable advantage of all our Eastern ports where most of it must in any event be transhipped to ocean going craft. Along this great route of commerce large ship repair and construction establishments will be built; manufactures will flourish, and the agricultural and other industries will find a ready market for their goods. The St. Lawrence with its cheap bulk transportation will become the Ruhr of North America.

7. To maintain Canada as a nation cheap East and West transportation is required and the St. Lawrence is one link in the chain. By it the western grain can be shipped to Europe some 3 cents cheaper per bushel than at present, and in return the coal of the Maritimes and of Wales would be made available in Western Quebec and Ontario. British Columbia lumber can obtain access to the Great Lakes area -- etc., etc.

No questions of derogation of sovereignty are necessarily involved in an agreement with the United States for its construction, and our rights and interests have been placed beyond dispute in the correspondence which has already passed. There is no longer any question of power export which might react to our disadvantage.

Our Railroads need not fear the competition of the water route. They should welcome the relief which it will give to the peak loads of traffic at present handled uneconomically and for which they must hold equipment in reserve idle during many months each year.

With a more uniform load factor general rates might well be reduced to the benefit of all, railroads and customers alike.

8. The project involves considerations of Navigation and of Power.

Of Power about 4/5ths pertains to Canada and 1/5th to the United States.

Of Navigation the most careful forecasts which have been made show that 4 tons of U.S. Shipping will probably move over the route for each ton of Canadian.

That is, if there is to be any intention of making the enterprise self supporting on the basis of charges for Power and Tolls for ships, it is to our interest to separate

these questions as far as may be practicable and to relieve Power of all possible charges at the expense of Navigation.

In Beauharnois we have done the opposite. There we are creating a Power enterprise with navigation facilities as an incidental at no cost to the State. The users of the Power will pay in rates the charges properly incident on navigation, 4/5ths of which might have been thrown on the citizens of the United States.

Under the presently prevailing sentiment in that Country it might well be possible to negotiate the project as a strictly navigation enterprise leaving the benefits to Power as an incidental consideration, 4/5ths of which would accrue to Canadian citizens in Ontario and Quebec.

Nov. 19. 1929

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