

(3) By establishing special damage courts to settle inundation claims.

(4) By constructing ideal developments at each concentration of fall, the energy to be transmitted and sold for specific purposes—transport, chemical reduction and manufacturing—possibly in the distant future for heat.

A proposed concentration is as follows:—

	Horse-power.
(1) Soo, 18-ft. fall	80,000
(2) Detroit regulation dam and lock....	30,000
(3) Niagara and other passes	2,000,000
(4) Whirlpool	2,000,000
(5) Iroquois	290,000
(6) Morrisburg	190,000
(7) Cornwall	700,000
(8) Coteau Fort	255,000
(9) Cedars	500,000
(10) Cascades	190,000
(11) Lachine	380,000
(12) Montreal	315,000
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	6,930,000

Turning now to the Ottawa valley, which is 55,000 square miles, about one-tenth of the whole St. Lawrence valley, the main stream could be concentrated as follows:—

	Horse-power.
Above Quinze only rough information.....	125,000
Quinze	200,000
Temiskaming to Mattawa	140,000
Dieux Rivières	50,000
Rocher Capitain	100,000
Des Joachims	65,000
Paquette	35,000
Calumet and Rocher Fendu	100,000
Cheneaux	70,000
Chats	125,000
Chaudière	165,000
Greece Pointe	80,000
Carillon	165,000
Back River	150,000
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	1,570,000

Dealing with the St. Lawrence and Ottawa Rivers alone and west of Montreal, only, there might be developed:—

On St. Lawrence, six millions horse power, half Canadian, half American.

On Ottawa, one and a half millions horse-power, all Canadian.

It would cost half a million dollars to concentrate the St. Lawrence and over a hundred million to concentrate the falls on the Ottawa.

Navigation is carried on for six months each year. Upon the St. Lawrence it approximates eighty million tons between Lakes Superior and Erie. Of this, 80 per cent. is American coal and iron between Pittsburg and Duluth, which will never go farther east. Between Niagara and Montreal the navigation dwindles down to only 3 per cent. of the upper lake traffic. From the port of Montreal about two million tons are carried out to sea each summer. The sudden drop in tonnage between Niagara and Montreal is due partly to the half-year of winter and partly to the small amount of rough freight from the west to Montreal. When the Hudson Bay route is in operation the tonnage to Montreal will be still less. Navigation is thus becoming of entirely secondary im-

portance to power on the St. Lawrence above Montreal and no navigation of consequence has ever existed upon the Ottawa. Between Niagara and Montreal power must now replace navigation as an international concern. There is a clear three million horse-power for each nation on the St. Lawrence and an additional million and a half for Canada alone on the Ottawa. This paper is not concerned with powers on the tributaries of the Ottawa and St. Lawrence; they are left to the promoter and the financial juggler.

When Cartier came to Montreal Island in 1535 he had to row up from Quebec, because even his little schooners were, as the rivermen say, "too long in the legs." Champlain did likewise, and so did everyone else until 1840. Then John Kennedy got to work and now there is a submerged canal from Montreal down, giving 35 feet draught. Currents yet exist, however, and a ship is always in peril of running on to the edge of the dredged channel or colliding with other ships. The improved channel is also lowering the surface and reducing the depth. Here, then, is another chance for a dam, and a big one—a rock-fill of sixty-six million cubic yards, with regulation sluices capable of passing 750,000 cubic feet second. The experience on the Winnipeg River for the past twenty years and on the Ottawa for the past five years shows that the rock-fill type actually becomes a part of the geology of the country.

The dam proposed would preferably be at Tadousac, 100 miles below Quebec. There would be a twin lock of Panama Canal size lifting up to the slack water pond extending 270 miles to Montreal. The pond surface would be slightly above the high tide level and be controlled by regulation sluiceways of ample size to ensure discharge between tides without currents over three miles per hour.

The new surface curve from Tadousac to Montreal would, of course, flood property, and a special damage court, as mentioned previously, is required to settle claims.

The channel to Montreal will at once be made forty feet deep and over and the danger of currents overcome. In winter surface ice alone without frazil would be formed. This on a slack water reach could be broken in March, so that the port of Montreal would be opened a month earlier.

The slack water reaches above Montreal would prevent the formation of frazil to drift down to Lake St. Louis and the harbor. A ship arriving at Montreal would not have to contend with river currents while docking.

There might, when the business of the water powers demand it, be a ship route by Lake St. Louis, Lake of Two Mountains and the Ottawa River to Hawkesbury, thence across country by the valley of the South Nation to the foot of Lake Ontario, near Cardinal. This would be an interior route and allow of ocean boats reaching Ottawa city, and eventually power sites farther west on the Ottawa as well as those on the St. Lawrence.

The concentration of falls on the St. Lawrence, especially between Prescott and Lachine, would adversely affect the steamship tourist business. Steel chutes at each dam, however, are quite possible to build, and down these a steamer load of tourists will experience all the necessary thrills.

The Whirlpool dam below Niagara Falls, proposed by Dr. T. Kennard Thomson, of New York, will extend this tourist route up to the very foot of the falls themselves, while an additional two million horse-power will be available for the general public.