St Lawrence River Canals
Before the Seaway in Ontario and Quebec
Field Trip Guide
June 5,6,7, 2015

Canal Society of New York State
Canadian Canal Society

On the Cover– An aerial view of the entrance to the Cornwall Canal at Cornwall. The new enlarged Locks 15 and 17 can be seen on the left side with the remains of Locks 15, 16, 17 repurposed as a drydock on the right. The 2 new locks replaced the old 3, and Lock 16 was eliminated.

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We thank Ron Beaupre for the use of his extensive collection of St. Lawrence and Seaway photos and history available at stlawrencepiks.com

A Timeline of New York and Canadian Canal Development

This is a very basic timeline, as I do not list start dates, repairs and other improvements.

1785– Canada Military Canals with locks of 40 x 6 x 2.5 open at Faucille, Trou du Moulin, Split Rock and Coteau du Lac

1793– NY– Western Inland Lock Navigation Co. begins improvements along the Mohawk River with locks 74 x 12 x 3.5

1805– Canada– Military Canals enlarged to 120 x 20 x 5

1824– Canada- Lachine Canal opens with locks 100 x 20 x 4.5

1825– NY-Erie Canal is opened with locks 90 x 15 x4

1829 -Canada– Welland Canal connects Lakes Erie and Ontario with locks 110 x 22 x 8

1833- Canada—all locks to be 200 x 45

1835– NY– Enlarge Erie with locks 110 x 18 x 7

1838– Canada– work stops due to financial concerns

1841– Canada– Welland Canal enlarges locks to 150 x 26.5 x9

1843– Canada- Cornwall Canal opens with locks 200 x 55 x 9

1846—Canada—Farran's Point, Rapide Plat and Iroquios Canals (the Williamsburg Canals) open with locks 200 x 45 x 9

1862—NY Erie Canal enlargement declared complete with locks 110 x 18 x 7

1867– Canada– Act of Confederation– Enlarge all canals to 270 x 45 x 14

1884– Canada- Lachine Canal locks enlarged to 270 x 45 x 14

1884– NY– Locks to be lengthened to 220 feet

1887– Canada- Third Welland Canal enlargement complete with locks 270 x 45 x 14

1895– NY deepen canals to 9 feet with locks 8 foot deep

1899– Canada– Soulanges Canal replaces Beauharnois Canal to get 14 feet of water in canal. Soulanges has locks 270 x 45 x 14.

1901– Canada—all canals have locks of 270 x 45 x 14

1918– NY Barge Canal opens with locks 328 x 45 x 12

1932– Canada- Welland Ship Canal opens with locks 766– 80 x 25

1958– St. Lawrence Seaway opens with locks 766 x 80 x 30

A Very Short Overview of Canadian History

It is almost impossible to study the canals of Canada without getting into some political history as the dates of the various . So here is the very short version. (edited from Wikipedia)

The **Province of Upper Canada** was a part of British Canada established in 1791 by the United Kingdom to govern the central third of the lands in British North America and to accommodate Loyalist refugees of the United States of America after the American Revolution. The new province remained, for the next fifty years of growth and settlement, the colonial government of the territory. Upper Canada existed from 26 December 1791 to 10 February 1841 and generally comprised present-day Southern Ontario. The "upper" prefix in the name reflects its geographic position being closer to the headwaters of the Saint Lawrence River than that of Lower Canada (or present-day Quebec) to the northeast.

The **Province of Lower Canada** was a British colony on the lower Saint Lawrence River and the shores of the Gulf of Saint Lawrence (1791–1841). It covered the southern portion of the modern-day Province of Quebec, Canada, and the Labrador region of the modern-day Province of Newfoundland and Labrador (until the Labrador region was transferred to Newfoundland in 1809). Lower Canada consisted of part of the former French colony of New France, populated mainly by French Canadians, which was ceded to Great Britain after that Empire's victory in the Seven Years' War, also called the French and Indian War in the United States. Other parts of New France ceded to Britain became the Colonies of Nova Scotia, New Brunswick, and Prince Edward Island. The Province of Lower Canada was created by the "Constitutional Act of 1791" from the partition of the British colony of the Province of Quebec (1763 –91) into the Province of Lower Canada and the Province of Upper Canada. The prefix "lower" in its name refers to its geographic position farther downriver from the headwaters of the St. Lawrence River than its contemporary Upper Canada, present-day southern Ontario. The Colony/Province was abolished in 1841, when it and the adjacent Upper Canada were united into the Province of Canada.

The **British North America Act, 1840** commonly known as the **Act of Union 1840**, was enacted in July 1840 and proclaimed February 10, 1841. It abolished the legislatures of Lower Canada and Upper Canada and established a new political entity, the Province of Canada to replace them. This act affected the political union of the Province of Canada, and was similar in nature and in goals to the other Acts of Union enacted by the British Parliament.

Canadian Confederation was the process by which the federal Dominion of Canada was formed on July 1, 1867. On that day, three British colonies became four provinces of the new dominion. The existing United Province of Canada was divided into the new provinces of Ontario and Quebec, and two other colonies, New Brunswick and Nova Scotia, also became provinces of the new Dominion of Canada.

Keep these various dates in mind as you study the history of the canals.

The St. Lawrence Route verses the Erie Canal

At the very basic level, the St. Lawrence Canals and the Erie Canal offer two different methods of performing the same task, that is to move goods and people between the Great Lakes and the Atlantic Ocean. Prior to 1825, the methods of overcoming the obstacles to completing the task were very similar. The natural waterway was improved by clearing obstructions, the digging of short canals, and building locks to help boatmen pass around rising land and the resulting rapids. For those who used the St. Lawrence, the river offered a direct connection between Lake Ontario and the Atlantic. The river offered deep water up to Montreal, and then by overcoming a few sections of rapids, pools of deep water offered many more miles of usable navigation. If a raft or small boat was sturdy enough, it could float the entire

way from Lake Ontario to the Ocean.

We see the same efforts made along the Mohawk River. For those who used the Mohawk River, more challenges had to be over come. The headwaters of the Mohawk River are in the Adirondack Mountains, so instead of offering a water route directly to Lake Ontario, boaters could reach Rome. After that, the route needed to be improved so that boaters could pass from the Mohawk to Oneida Lake to the Oneida River and then to the Oswego River, or west on the Seneca River to the Finger Lakes. Even the upper Hudson River, which forms part of the route between the Mohawk and the ocean, had to be dredged and improved to offer a draft deeper than 6 feet.

In spite of all this, the New York route had advantages in that the climate was warmer and the population was larger. Without people growing, shipping, and purchasing goods, there is little reason to have a improved water route. New York had New York City, and the largest seaport on the seaboard.

Both the natural routes led to Lake Ontario. It was impossible to reach Lake Erie and the rest of the Great Lakes without a way around Niagara Falls. To reach Lake Erie, a manmade canal would need be constructed. And it is here that our story begins. Thomas Grasso calls the construction and improvements of the Erie Canal and the St. Lawrence Canals an arms race, where each side tries to out build the other. This race began in 1825 with the opening of the Erie Canal and ended in 1958 with the opening of the St. Lawrence Seaway.

From 1825 to 1843, the New York route had the decided advantage as the route was complete and safe. For those on the St. Lawrence, larger boats could reach Montreal and then pass through the Lachine Canal to reach Lake St. Louis. This wider and deeper section of river allowed another 16 miles of navigation until larger rapids block the way west. For boats headed downstream, they could safely reach Dickinson's Landing to the west of Cornwall. In between Dickinson's Landing and Lake St. Louis are the Long Sault Rapids, and then the Coteau, Cedars, and Cascades rapids. In-between the Long Sault and the Coteau sections lies Lake St. Francis, another wider deeper section of the river, but not accessible without a canal to bypass the rapids to the east and west. Until these canals could be built, the Erie was the only way to ship large quantities of freight.

This is why the timing of the Act of Union of 1840 is very important. While Upper and Lower Canada were joining to become a stronger entity, enabling Canada the resources to build canals that had been talked about for years, New York State was running out of money as it tried to enlarge it's canal from 4 by 40 to 7 by 70. In 1842, the Stop and Tax Act forced all work on the Erie to stop. So while the people watched the weeds grow and the wooden parts rot at unfinished lock projects along the Erie, all they had to do was look north to see Canada rushing ahead in the shipping wars. In 1842, the Albany Daily published a article that was quickly picked up by friends of the Erie. From the August 20, 1842 Schenectady Cabinet, we find this description of the new Canadian canals.

Internal Improvements In Canada

To a citizen of the State of New York, by far the most interesting feature of Canada and the British Colonial policy, at the present moment, is the vigorous prosecution and the rapid progress of the magnificent system of public works now pressing forward to completion, in the valley of the St. Lawrence and the basin of the great lakes– and all this, too, at a period when a portion of our own people– in reality a portion, but unfortunately, the portion holding the power for the time being– has become so besotted with theoretic folly, an frightened by financial bug-bearers, or so maddened with factious politics, as tto have succeeded in suspending our own public works, and actually to recommend their discontinuance, or a prosecution of them at so slow a rat4 as to be practically tantamount to a discontinuance.

A simple statement of the line of canals about to be completed in Canada, may, at this time, be read with peculiar interest.

The line commences with the LaChine canal, extending from Montreal to the village of LaChine,

a distance of eight miles. This work is about to be enlarged, and it will form the first link of the chain which is to connect the navigation of the St. Lawrence with that of the great interior lakes, through which runs the boundary between the United States and the British dependencies, and to which, therefore, the people and the trade of both nations have equal and free access.

At LaChine you enter an expansion of the St. Lawrence called Lake St. Louis– similar to that of the Tappen sea in the Hudson River– and have a steamboat navigation to the Cascades, at the mouth of the Ottawa. At this point, which is the village of Beauharnois, commences the Beauharnois canal begun this year, and to extend sixteen miles, to a point opposite Coteau du Lac, surmounting the obstacles to navigation caused by the several rapids, known as the Cascades, the Cedars, and the Coteau du Lac, which make in all, a difference in elevation of about sixty feet.

At this last point you enter another expansion of the St. Lawrence, called Lake St. Francis, which takes you to Cornwall, at a distance of forty miles, and on the 45th parallel of north latitude. At this point commences the Cornwall canal, which is expected to be finished this season. It extends to Dickinson's Landing, eleven miles, and passes the Long Sault rapids, which have a total descent of about fifty feet. This canal is a fair sample of the other works. It has six locks of solid masonry , constructed in the most durable manner, each two hundred feet long in the chamber, by fifty feet wide, with a depth of ten feet of water. They are designed, therefore, to accommodate the largest class of Lake Ontario steamers, and most of the ships that navigate the St. Lawrence from Quebec to Montreal.

From Dickinson's Landing to Kingston, steamers of a large class now ply, though there are two or three rapids below Ogdensburgh.

From Kingston the route is by the lake to the of connection with the Welland canal. This work, now being enlarged, is but a continuation and completion of this great line of works designed and destined to furnish a continuous ship navigation throughout the whole extent of the valley of the St. Lawrence and the basin of the great lakes, from Quebec to the Falls of St. Mary. When this chain of communication is finished, and the great route of travel and traffic is opened and in use, it will give to the Canada's an exclusive as well as direct communication between the vast and far north-west, and the Atlantic ocean– a result which, unless counterbalanced by the completion of our own great works, especially the Erie Canal Enlargement, will give to the British navigation and commence advantages of the greatest importance, and will operate in the deep and lasting injury of the State of New York.

It is precisely in such a relative condition of things– such a posture of the mighty struggles going on for the trade of the west– that this great State has been struck with the torpor of Loco Focoism , and is compelled to set chained and look on with her own eyes upon the triumphant achievement of the prize by her sagacious and public spirited rival. Albany Daily

Key to the success of the St. Lawrence route was the construction of the Welland Canal. Without it, the headwaters of its trade would be confined to the northern shores of Lake Ontario. And with locks slightly larger then those on the Erie, the Welland offered great advantages to those on both sides of the border. Boaters found it easier and faster to use the Erie and Oswego Canals to reach Lake Ontario and then pass through the Welland to reach Lake Erie.

Even with the canals along the St. Lawrence route complete, and the New York canals still in the midst of a enlargement that was taking decides, the Erie was able to dominate for a few reasons.

1) The Erie offered a direct connection to New York City and the largest seaport of the day.
2) The ships that plied the waters of the lakes were larger then the locks on the St. Lawrence. This meant that freight had to be transshiped at Kingston onto smaller boats that would be towed to Montreal. This offered no advantage to the transshipping of ships at Buffalo and using the Erie Canal

3) Steam powered craft of the period were still in the early years of development. Side-wheelers were the predominate craft, and these didn't fit into narrow locks. Boats on the St. Lawrence were limited to river barges or sailing craft

In 1867, after the Canadian Confederation, it was announced that all the locks would be enlarged to 270 by 45 by 14. In 1862, New York had proclaimed that the enlargement of the Erie Canal was complete with locks of 110 by 18 by 7. Also in the 1870's, the screw propeller and smaller more powerful steam engines made it possible for self powered vessels to navigate the St. Lawrence River. So New York State was once again forced to take a hard look at the Erie and its future. In his 1873 message, Governor Dix noted the work in Canada and suggested that Lake Champlain be looked to as a possible ship route between Canada and New York. In 1874, Governor Dix took a more ominous tone, writing, *"It is not probable that any competing water communication can ever interfere with us materially, unless it be by the river St. Lawrence."* The push in New York was for not only a deeper Erie Canal, but also for steam to replace horses as the means of motive power. On January 1, 1878, Horatio Seymour, Jr, assumed the office of the State Engineer and Surveyor. He seems to have been tasked with taking a hard look at the future of the Erie Canal, as his first Annual Report (for the year of 1878) is full of studies about a deeper canal and the state of the Canadian Canals. He dispatched Divisional Engineer Thomas Evershed to take a tour. He reported;

At your request, I have visited the Canadian canals, and herewith send you a description and short history of them, together with what has been done toward enlargement.

By these canal a continuous navigation is obtained from Lake Erie to the tidal waters of the Gulf of St. Lawrence. They consist of the Welland, connecting Lakes Erie and Ontario, avoiding the Falls and the Rapids of Niagara river, and six pieces of canal, avoiding the rapids of the St. Lawrence, called the "St. Lawrence Canals". These six pieces are respectively the "Galop", the "Rapide Plat", and "Farren's Point" canals, comprised in the Canadian reports, etc., under the collective head of the "Williamsburg Canals", the "Cornwall" "Beauharnois", and "Lachine" canals.

At a very early day, the inhabitants of Canada were alive to the importance of establishing a continuous navigation between the great lakes and ocean navigation below the Falls and rapids which separated them; the more so, as in those days, before the construction of the Erie Canal, and before the era of railroads, it seemed to them the only really true route by which the interior could have access to the seaboard.

As long ago as the French Dominion in Canada, we read of cut stone locks existing on a canal around one of the rapids of the St. Lawrence (Beauharnois), having a breadth of six feet and the depth of two and one half feet, navigated by boats having a carrying capacity of thirty barrels of flour, and up to 1804 this was the capacity of the Canadian canals. The canal at the same point, Beauharnois, when enlarged to its contemplated size, will pass vessels capable of carrying 2,000 tons. This difference is very striking, and sufficiently exemplifies the progress made during the past sixty years.

At several of the points above enumerated the original canals have been replaced by larger ones, and those have been re-enlarged, one has had the third set of locks, until the present time it is proposed to make all the canals of this line of navigation of the size of 80 to 100 feet wide on the bottom, locks 270 feet in length and 45 feet in width, with 14 feet depth of water on the mitre-sill.

Williamsburg Canals

Galop Canal.

The Galop Canal is 7 5/8 miles in length with 3 locks, having a total rise of 15 ¾ feet. The locks are 200 feet in length, 45 feet in width, having 9 feet depth of water on the mitre-sill. The canal is 50 feet wide on the bottom and 90 feet on the top. In 1833 surveys were made for this and other canals, but nothing was done until after the union of the two provinces in 1841. In 1843 work on the present canal was begun, and it was finished in its existing state in 1856.It is contemplated to lower the bed of the river at the upper end of this canal, on what is known as the "Galop Rapids", by sub-marine operations. The

bids are in for this work. The present depth is 10 feet, this will be increased to 16, with a channel width of 300 feet, and will do away with the necessity of enlarging the Williamsburg group of canals, except in the lengthening of the locks, so that vessels may go up them at any time, if found necessary. The method of ascending this portion of the river will then be by cable-towing, which can be done without interfering with vessels descending, there being no place in the channel, except at this rapid, having less than 22 feet of water.

Rapide Plat Canal

Four and a half miles below the Galop, we reach the "Rapide Plat" canal, which is 4 miles in length. It has 2 locks, with a total lockage of 11 ½ feet, the locks are 200 feet long, 45 feet wide, with 9 feet of water on the mitre-sill. The canal is 50 feet wide on the bottom and 90 feet on top. This canal was also built after the union of the provinces in 1841. It was commenced in 1844 and completed in 1846. Nothing has been yet done towards lengthening the locks.

From the foot of the "Rapide Plat" to the head of Farren's Point canal, the last of the Williamsburg group, there is a reach of river navigation of 10 ½ miles, and in this distance there are several points of rock which will have to be removed by sub-marine excavation to secure a free channel.

Farran's Point Canal

This canal, commenced in 1844 and finished in 1847, is three fourths of a mile in length, has 1 lock of the same dimensions as the rest of the group, viz, 200 feet by 45 feet, and 9 feet of water on the mitre-sill. The lock rise is 4 feet, breadth of canal at bottom 50 feet, top breadth 90 feet. Nothing has been done towards lengthening the lock. From the foot of Farran's Point to the head of the Cornwall canal there is 5 miles of free river navigation.

Cornwall Canal

This canal, which overcomes the "Long Sault" rapids, is 11 ½ miles in length, has 7 locks 200 feet long, 55 feet wide, with 9 feet of water on the mitre-sill. Total lockage, 48 feet, bottom width of canal 100 feet, top width 150 feet.

In the years 1816, 1818, 1823, 1825, 1826, and again in 1830, the subject of this canal, with others, was agitated in the Parliaments of the two provinces. In 1833 reports were had on the subject, and in 1834 work was commenced on this canal, but for various reasons it was not completed and brought into use until nine years afterwards, viz, 1843.

The intention of the authorities is to lengthen the present locks to 270 feet, preserving the present breadth of 55 feet, to raise the lock walls, and raise and strengthen the canal banks, so as to give the required depth of 14 feet on the mitre-sills, and to make new entrances and locks at the upper and lower ends, retaining the old entrances with the present locks, but with the difference, that at the lower end there will be 2 locks instead of 3, as at present. These 2 new locks and the earthwork, for about the distance of a mile, are now in progress. The whole can be completed in two years.

Lake St. Francis

Between the foot of the Cornwall and the head of the Beauharnois canal comes Lake St. Francis, a widening out of the river. This is 32 ¾ miles in length, with a depth of 22 feet almost all the way. Some dredging, however will be necessary to give the desired depth of 14 feet throughout.

Beauharnois Canal

This is the only canal lying on the south bank of the St. Lawrence. It does not follow the course of the river, but strikes somewhat inland, overcoming the three rapids at that point, viz; The "Coteau", "Cedars" and "Cascades".

During the French dominion in Lower Canada, four short pieces of canal were constructed, accommodating boats of three tons burden, as before mentioned. In 1804 improvements were made in

them. In 1817 their locks were enlarged from 6 to 12 feet in width, admitting boats capable of carrying twelve tons. From 1833 to 1839 various reports were made as to the best method of enlarging this canal, but nothing was done until after the union in 1841.

In 1842 the work of enlargement was begun, and was finished in its present state in 1850. Its length is 11 ¼ miles, with 9 locks 200 feet by 45 feet, with 9 feet of water on the mitre-sill. The total lockage is 82 ½ feet. Width of canal at bottom is 80 feet, at water line 120 feet.

The enlargement will consist of raising the banks so as to give the required depth of water, except at the head and foot, where, of course. The prism will have to be deepened. There will be duplicate entrances and locks, the new one at the head extending up the river two miles from the present entrance, that at the foot extending down the river half a mile further than the present one. Except at the head and foot, at the new entrances, where new locks will be necessary, the present locks will be lengthened to 270 feet, and the walls and canal banks raised to give the required depth of water on the mitre-sills. No work has been done towards enlargement other than surveys. It will be finished, however, in three years. (there is much more to this report, including information about the Lachine Canal, looking at shipping tonnages, costs of shipping and how to make the Erie Canal competitive, etc.)

In 1881, Governor Cornell wrote; *"The near completion of the enlargement of the Canadian canals renders the future of the Erie canal a subject of much concern, and well worthy of your intelligent consideration. If the enterprise of our neighbors in improved navigation is liable to place us at a disadvantage in competing for the carrying trade of the great West, it is high time that a remedy be sought to avert possible misfortune."*

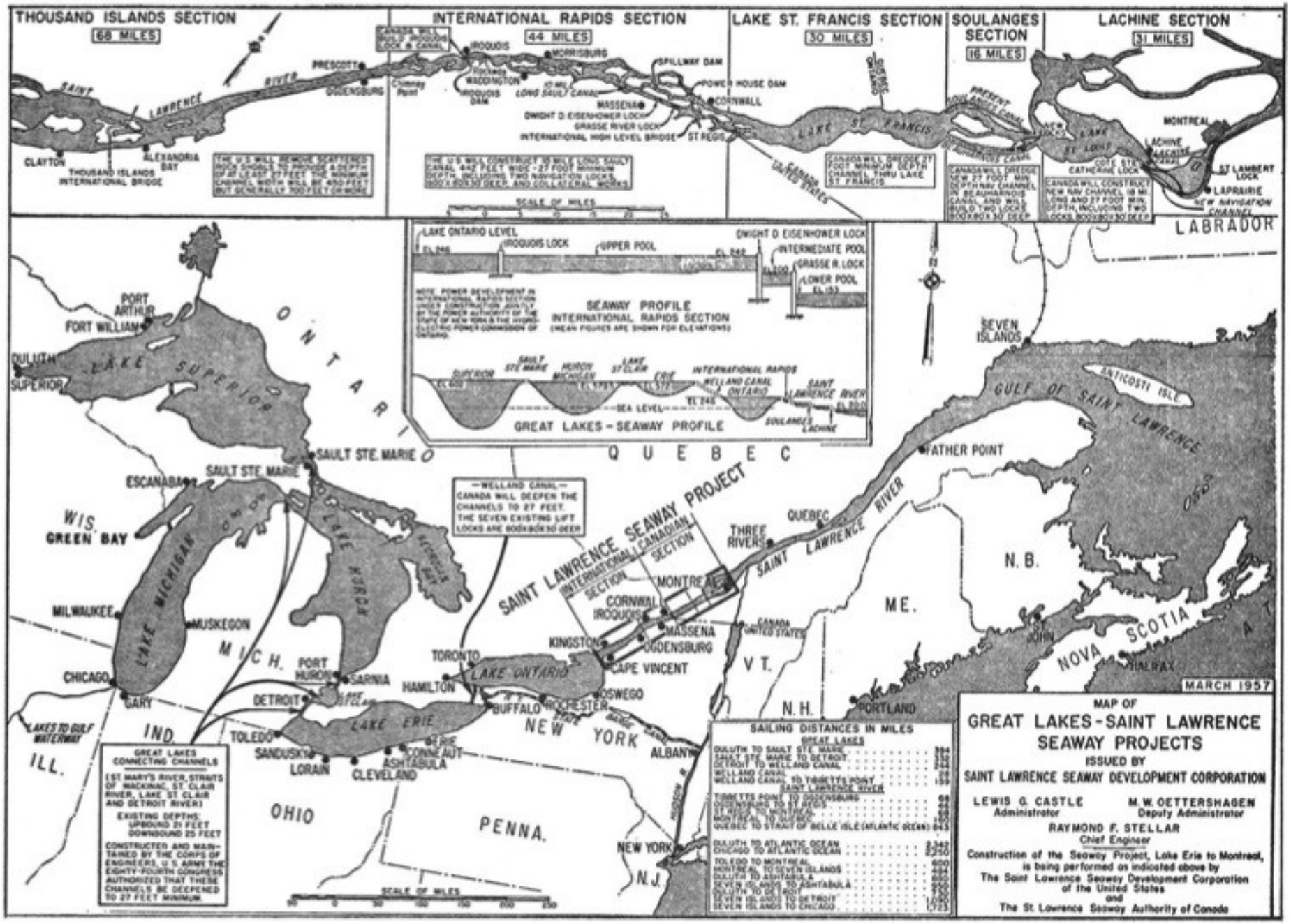
After the decades it took (and the millions spent) on the enlargement of the Erie Canal, it was unlikely that New York was going to begin another enlargement of the locks. The future of the Erie Canal lie in making it a cheaper route in-spite of the size disadvantage. The easiest way to reduce the cost of shipping was to reduce the tolls. After this, the only methods to reduce the cost of shipping was to reduce the time it took to transverse the canal and increase the capacity of the canal by offering more water. Improvements were made to the Erie to make it competitive. The 1878 Frick or Illinois system of lashing boats together to allow one crew to operate two boats in a sense doubled the size of the boats to 400 tons. In 1881, the State installed water powered machinery at the locks to help lessen the time it took to pass through. And to aid the boatmen with their longer boats, in 1884 the State began to lengthen the locks to 220 feet. The only other options New York had to compete was to deepen the canal. This was attempted with the nine million dollar enlargement of 1895, an project that would quickly fail because of a lack of funds and gross mismanagement.

Meanwhile in Canada, the canals and locks were being improved and enlarged to reach a uniform goal of 270 by 45 x 14. The sailing ship that could pass through the locks could carry around 350 tons. A non-powered lake barge (186 by 44 by 8) could carry 750-800 tons. After the construction of the Soulanges Canal in 1899 and the enlargement of the locks, ships could carry between 1500 and 3000 tons.

If New York was to continue to compete, it would need to make a drastic enlargement of the Erie Canal. In 1903, the State voted to spend 101 million to build the barge canal with locks 328 by 45 by 12. This would allow boats of 2000 tons. The Barge Canal was opened in 1918. In the 1930's the canal was deepened to 14 feet and bridges raised between the Hudson River and Oswego so that larger boats could reach Lake Ontario. This would be the last physical improvement on either side of the border until the construction of the St. Lawrence Seaway in 1958. If improvements were to be made, it would be by the boat builders.

For the purposes of this guide, we will visit small segments of each canal as we follow the canals of the St. Lawrence from east to west, highlighting each stop of the tour.

A section of a map from the 1878 Annual Report of the State Engineer and Surveyor

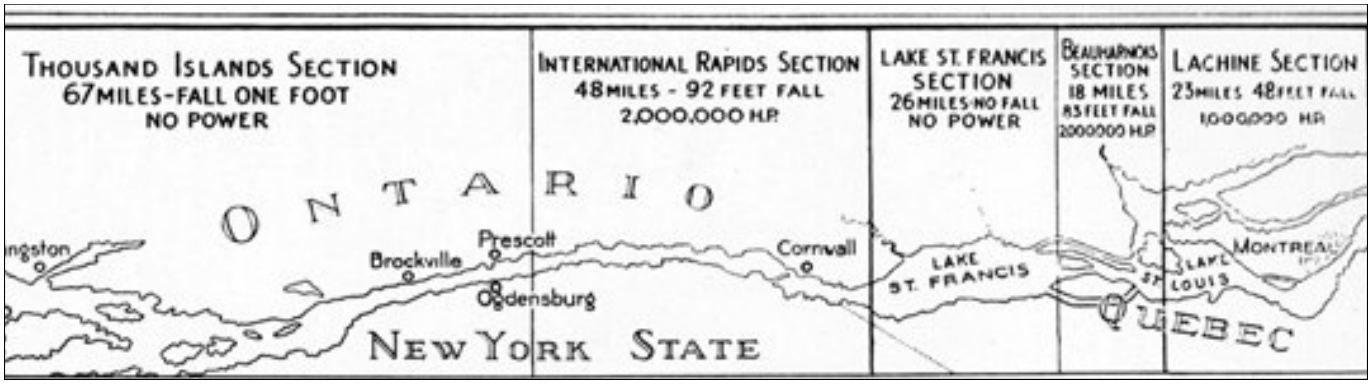

THOUSAND ISLANDS SECTION
68 MILES
INTERNATIONAL RAPIDS SECTION
44 MILES
LAKE ST. FRANCIS SECTION
30 MILES
SOULANGES SECTION
16 MILES
LACHINE SECTION
31 MILES
SAINT LAWRENCE RIVER
PRESCOTT
OGDENSBURG
CLAYTON
ALEXANDRIA BAY
THOUSAND ISLANDS INTERNATIONAL BRIDGE
IROQUOIS
MORRISBURG
CHIMNEY POINT
WADDINGTON
IROQUOIS DAM
SPILLWAY DAM
POWER HOUSE DAM
CORNWALL
MASSENA
DWIGHT D. EISENHOWER LOCK
GRASSE RIVER LOCK
INTERNATIONAL HIGH LEVEL BRIDGE
ST. REGIS
LAKE ST. FRANCIS
CANADA
UNITED STATES
MONTREAL
LACHINE
ST. LAMBERT LOCK
LAPRAIRIE
NEW NAVIGATION CHANNEL
LABRADOR
SCALE OF MILES
LAKE ONTARIO LEVEL
IROQUOIS LOCK
UPPER POOL
DWIGHT D. EISENHOWER LOCK
INTERMEDIATE POOL
GRASSE R. LOCK
LOWER POOL
SEAWAY PROFILE
INTERNATIONAL RAPIDS SECTION
(MEAN FIGURES ARE SHOWN FOR ELEVATIONS)
SAULT STE. MARIE
HURON
MICHIGAN
LAKE ST. CLAIR
ERIE
INTERNATIONAL RAPIDS
WELLAND CANAL
ONTARIO
SAINT LAWRENCE RIVER
SEA LEVEL
SOULANGES
LACHINE
GREAT LAKES - SEAWAY PROFILE
ONTARIO
QUEBEC
LAKE SUPERIOR
PORT ARTHUR
FORT WILLIAM
DULUTH
SUPERIOR
SAULT STE. MARIE
ESCANABA
WIS.
GREEN BAY
MILWAUKEE
MUSKEGON
MICH.
CHICAGO
GARY
IND.
ILL.
LAKE MICHIGAN
LAKE HURON
MACKINAC
PORT HURON
SARNIA
DETROIT
TOLEDO
SANDUSKY
LORAIN
CLEVELAND
ERIE
CONNEAUT
ASHTABULA
LAKE ERIE
OHIO
PENNA.
NEW YORK
N.J.
TORONTO
HAMILTON
LAKE ONTARIO
BUFFALO
ROCHESTER
OSWEGO
KINGSTON
CAPE VINCENT
ALBANY
HUDSON
SAINT LAWRENCE SEAWAY PROJECT
INTERNATIONAL SECTION
CANADIAN SECTION
CORNWALL
IROQUOIS
MASSENA
OGDENSBURG
MONTREAL
THREE RIVERS
QUEBEC
SAINT LAWRENCE RIVER
SEVEN ISLANDS
GULF OF SAINT LAWRENCE
ANTICOSTI ISLE
FATHER POINT
N.B.
ME.
VT.
N.H.
PORTLAND
NOVA SCOTIA
ST. JOHN
HALIFAX
PRINCE EDWARD ISLAND
WELLAND CANAL
CANADA WILL DEEPEN THE CHANNELS TO 27 FEET. THE SEVEN EXISTING LIFT LOCKS ARE 80 FEET BY 80 FEET
GREAT LAKES CONNECTING CHANNELS
(ST. MARY'S RIVER, STRAITS OF MACKINAC, ST. CLAIR RIVER, LAKE ST. CLAIR AND DETROIT RIVER)
EXISTING DEPTHS:
UPBOUND 21 FEET
DOWNBOUND 25 FEET
CONSTRUCTED AND MAINTAINED BY THE CORPS OF ENGINEERS, U.S. ARMY THE EIGHTY-FOURTH CONGRESS AUTHORIZED THAT THESE CHANNELS BE DEEPENED TO 27 FEET MINIMUM.
LAKES TO GULF WATERWAY
SCALE OF MILES
SAILING DISTANCES IN MILES
GREAT LAKES
DULUTH TO SAULT STE. MARIE 384
SAULT STE. MARIE TO DETROIT 352
DETROIT TO WELLAND CANAL 254
WELLAND CANAL 27
WELLAND CANAL TO TIBBETTS POINT 159
SAINT LAWRENCE RIVER
TIBBETTS POINT TO OGDENSBURG 68
OGDENSBURG TO ST. REGIS 43
ST. REGIS TO MONTREAL 129
MONTREAL TO QUEBEC 180
QUEBEC TO STRAIT OF BELLE ISLE (ATLANTIC OCEAN) 643
DULUTH TO ATLANTIC OCEAN 2,340
CHICAGO TO ATLANTIC OCEAN 2,210
TOLEDO TO MONTREAL 600
MONTREAL TO SEVEN ISLANDS 454
DULUTH TO ASHTABULA 880
SEVEN ISLANDS TO ASHTABULA 950
DULUTH TO DETROIT 738
SEVEN ISLANDS TO DETROIT 1,092
SEVEN ISLANDS TO CHICAGO 1,723
MARCH 1957
MAP OF
GREAT LAKES - SAINT LAWRENCE SEAWAY PROJECTS
ISSUED BY
SAINT LAWRENCE SEAWAY DEVELOPMENT CORPORATION
LEWIS G. CASTLE
Administrator
M. W. OETTERSHAGEN
Deputy Administrator
RAYMOND F. STELLAR
Chief Engineer
Construction of the Seaway Project, Lake Erie to Montreal, is being performed as indicated above by
The Saint Lawrence Seaway Development Corporation of the United States
and
The St. Lawrence Seaway Authority of Canada

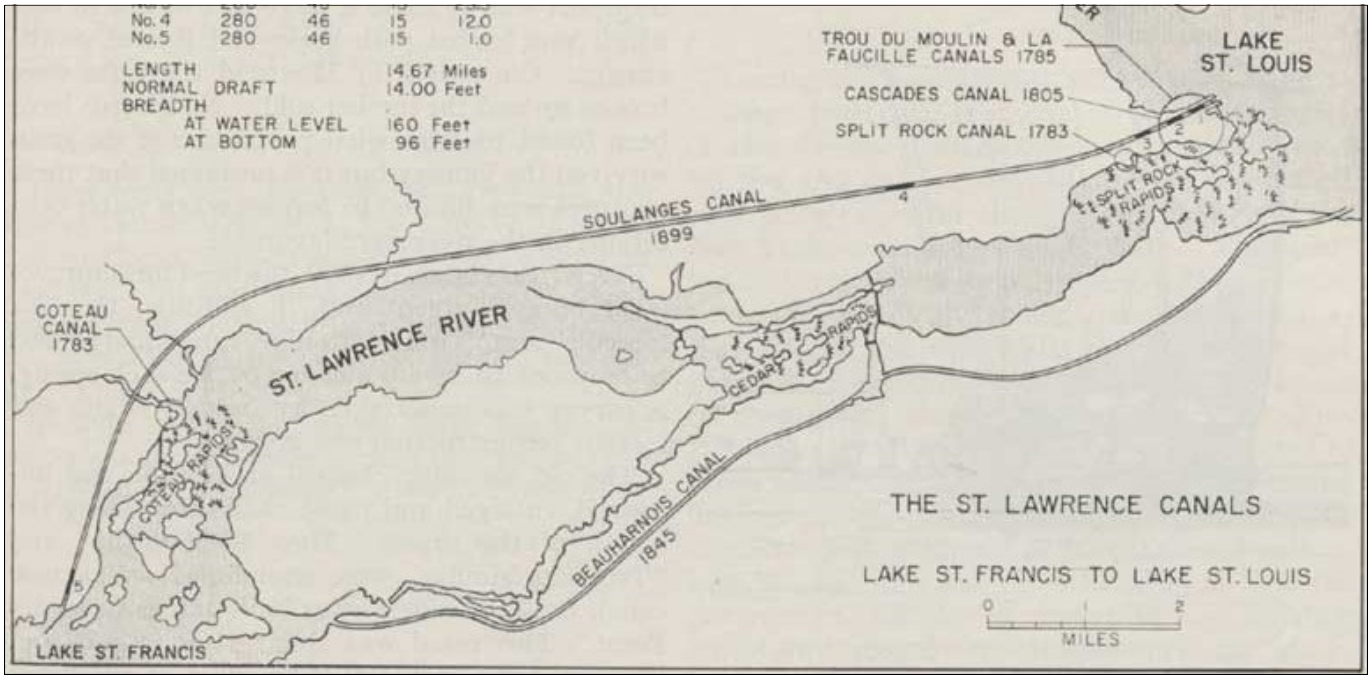
The Military Canals

In our tour of the St. Lawrence Canals, we are attempting to describe and highlight the many parallels between what took place in New York and Canada. So it is fitting to start with the early canals along the river, in this case, perhaps the first canals constructed in North America.

This map, taken from a power study in the 1950's, shows the St. Lawrence broken into sections of fast and slow moving water. For our purposes, and for those not familiar with the river, it shows where (why) the canals were built. The first canals were built to assist boaters through the part of the river shown as the Beauharnois Section which consisted of (west to east) the Coteau, Cedars, Split Rock, and Cascades rapids. This section of fast moving water was 18 miles long and would later be by-passed by the Beauharnois (1845) and then Soulanges (1899) Canals. However, in 1779, the first canals in North America was built at Coteau du Lac and Split Rock. The Coteau Canal was 7 feet wide and had three locks about 40 feet long. The Split Rock was 6 feet wide. Both offered 2 feet of draft. The canoes and batteaux that used it could carry three tons. These canals were later enlarged to 9.5 feet wide and 3 feet deep. After 1812, Durham boats came into use and these were used up till the opening of the Beauharnois Canal in 1845.

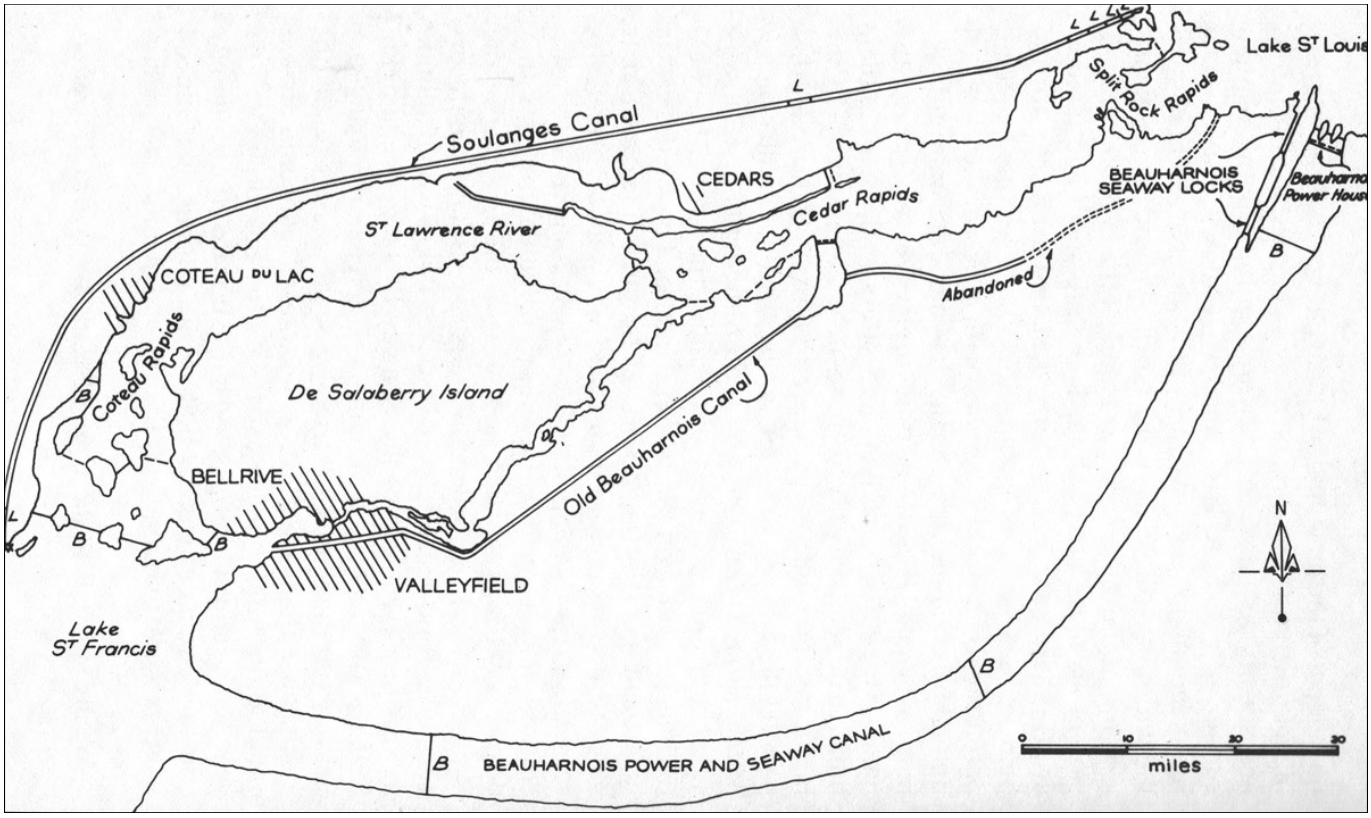
We can compare these canals to those of the Western Inland Navigation Company and their pre-Erie Canal works along the Mohawk River at German Flats and Little Falls.





The Soulanges Canal

Our first stop of the day is on the Soulanges Canal at the Pointe des Cascades and Lock 3.



The Beauharnois Canal was built in 1842-1845 and was the only canal built on the south side of the river. It was 11.5 miles long and had 9 locks (Locks 6-14), with a total lift of 83.5 feet. The canal is described as being twisting and the entrance as being dangerous since it was on a narrowed section of the river and at the head of a rapid. The Beauharnois was replaced as it was difficult to increase the flow of water and get the needed 14 feet depth for the newer locks proposed after the 1867 Canadian Confederation. The Beauharnois was replaced by the Soulanges Canal built along the north shore and opened in 1899. After 1899, the western section of the Beauharnois Canal was kept as a power and water regulation canal. (To confuse matters, the new canal dug for the Seaway was named the Beauharnois Seaway Canal.)

The Soulanges was the last canal built along the river until the Seaway construction of the 1950's. The locks were 280 by 45 with 14 feet draught. The canal was 14.6 miles long In an issue of the Queen's Quarterly, the author described the new Soulanges Canal as "an example of matured practice in hydraulic engineering", and "a monument of human skill". He writes; "It has four lift-locks and a guard lock; the first three locks have the tremendous lift of 23.5 feet, the fourth a lift of 12 feet and the guard lock of 2 feet. It was decided to construct the Soulanges on the north shore of the St. Lawrence, for several reasons; partly as the curve was less, less locks were required, and also on account of the presence of quicksands on the south shore. The banks along the upper level, 11 miles in length, are built three feet higher than the high water in Lake St. Francis, so that the guard lock can be left open if necessary. This canal was carried over three rivers, the Delisle, River Rouge and River a la Graisee, where electricity is generated for both lighting the canal and operating gates, valves and bridges. The lights are closer than the ordinary city street light, being of the same power, and nowhere more than 160 yards apart, and clustered at the locks. Boats can pass up and down this canal as easily by night as by day. The dimensions of the locks are 260 feet long by 46 feet wide and the water is fifteen feet on the sills. [ed-the locks were

280 feet long]. The canal is beautifully finished with sodding, closely cut, graveled paths, and macadamized roads, and tree are planted on the north side. The bridges are graceful in design and are painted white– as in railways they are painted red, so in canals white is used."

The Le Petit Pouvoir , the small power house built to provide electricity along the Soulanges Canal. This building still stands and can be seen from both the Chemin du Canal and the Chemin du Fleuve.

The lock numbering on the Soulanges can be a bit confusing. Over the years, changes brought on by canal enlargements and other modifications have left the lock numbering system a bit of a mystery to the new explorer. Basically the lock numbers run from east to west, and did run sequentially with Lock #1 being at the eastern end of the Lachine Canal, and Lock 27/28 at the western end of the Galops Canal.
Lachine– Locks 1-5
Beauharnois- 6-14
Cornwall– 15-21
Farrans Point– 22
Rapide Plat– 23-24
Galop-25-27/28

Our guide Ron Beaupre explains it this way;

The official government numbering of locks begins in Montreal Harbour and ends at the locks west of Cardinal, Ontario. The first series of locks, completed in 1847, required 26. To bypass the Lachine Rapids near Montreal, it required 5 locks. The second set of Lachine Locks were in parallel to the first, so no change in numbering. To bypass the Cascades, Cedars, and Split Rock rapids, the first canal, which began at Beauharnois, required 9 locks. The second, or Soulanges Canal only needed 5 lift locks. The government referred to these locks as Soulanges Lock 1-5.

However, when the ships arrived at Cornwall, the lock number is Lock 15, reverting back to the old numbering system. The first locks had a series of three locks very close together. When the second enlarged canal was built in parallel, the engineers bypassed the first three locks with just two. Therefore up bound ships would depart Lock 15 and, after sailing across a short pool of water, enter Lock 17.

Similarly in the Galops Canal at Iroquois up bound ships entered Lock 25 and exited Lock 26 at Cardinal in the first canal. After the second canal bypassed Lock 26 and they ran up to Lock 27. Old Lock 26 is buried now by a generating station.

Two images of Lock 3.

Above- Lock 3 had a lift of 23.5 feet. The yacht is down-bound or headed east.
Below- The John H. Price is up-bound exiting Lock 3. Note the swing bridge in its open position .Swing bridges were critical as they allowed boats to have the superstructure needed to be seaworthy in open water.

The Cornwall Canal

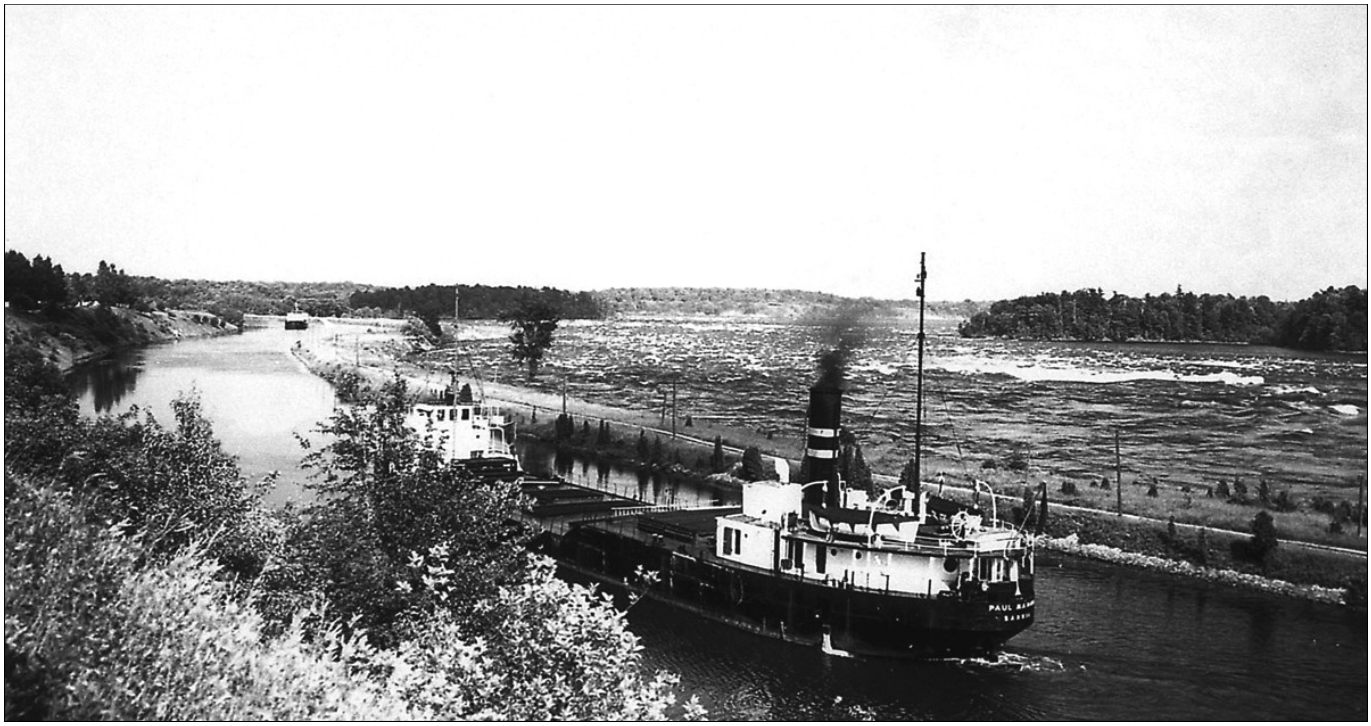
Our tour stops at the well preserved Lock 19 on the Cornwall Canal. As with the Soulanges, much of the route of the canal is intact, however, only two of the six locks remain intact and Lock 19 is the best of the two and is the most accessible. Locks 15, 16, and 17, which were located near the heart of the city and on the eastern end of the canal have been lost to a water front park. Locks 20 and 21 have been lost to the waters of the Seaway.

A view of Lock 19 The Shiercliffe Hall is west bound.

After passing through the Beauharnois or Soulanges Canal, boats entered Lake St. Francis, a 31 mile long widening of the river. Reaching the Long Sault rapids, the boats had to enter the Cornwall Canal, a 11 mile long canal with a total lift of 48 feet. The city of Cornwall lies at the eastern end, and Dickinson Landing lies at the western end. The confusing number scheme continues here, with the old numbering remaining intact. So after leaving Soulanges 5, the next lock is Cornwall 15. and then you skipped to 17.

Lock 17 was the controlling lock for the boats that would use the system. Instead of offering 45 feet of width, the actual width was 43 feet 8 inches, and so all boats could be no wider. Although Locks 15 and 17 are gone, it is worth a visit to the site to see the old lock tenders residence and offices, now repurposed as the Royal Canadian Air Force Association building. (Locks 15 and 17 are on the cover of this guide book.)

Lock 19 lies 7 tenths of a mile east of the Moses-Saunders Power Dam. The dam creates a pool that extends west to Iroquois for the present day Seaway. Across the river (and the international boundary) the Snell and Eisenhower Seaway Locks serve to replace the Cornwall Canal. (They are the only two Seaway locks built on the American side.) The Moses-Saunders Dam was constructed over the western end of the Cornwall Canal, and had to accommodate the Cornwall Canal during its construction. A gate can be seen in the dam that allowed traffic to continue to use the canal right up until the last day in 1958 and the flooding of the Seaway.



A view of the Cornwall Canal, showing the fast water of the Long Sault Rapids in the background.

The Galop Canal, Locks 25, 27 / 28, and the Deep Cut

While the rapids at Cornwall and Beauharnois were considered too dangerous for most boats to pass through, there were a number of smaller rapids that were passable at least for boats going downstream. Some of the more powerful boats could also pass through going upstream, but for most boats, canals and locks helped upstream boats overcome the obstacle. These canals were grouped together as the Williamsburg Canals and included the Farran Point, Rapide Plat, Iroquois, and Cardinal. The Iroquois and Cardinal were later connected and become the Galop Canal, named for the Galop Rapids which the canal bypasses. With the construction of the Seaway and the flooding caused by the project, the Farren Point and Rapide Plat are under water. Luckily for us, much of the Galop is intact, which includes our two stops at Lock 25 and Locks 27 / 28.

Lock 25 and Iroquois

We make a stop at Lock 25 in Iroquois. Lock 25 marks the eastern end of the old Iroquois Canal, which was connected to the Cardinal Canal to form the Galop. Here we see the old and the new Lock 25's. The old being the 200 by 45 locks, and the new being 800 feet long and 45 feet wide. During the locks lengthening to 270 feet long, Lock 25, along with Lock 22 at Farren Point, were enlarged to be "fleet locks". These triple length locks allowed "fleets" of three boats to lock through at one time. The new Lock 25 was put into use in 1899. Farren Point was put into use in 1901.

We also get a dramatic example of how the construction of the Seaway changed the landscape and people's lives. As you stand at Lock 25, look to the roadway that disappears under the water at the low end

A view of Lock 25 and the Village of Iroquois prior to the construction of the Seaway.
The old Route 2 can be seen running through the Village.

The new Lock 25 enlarged to 800 feet could lock through three boats at one time. In the top photo, we get a view of one of the older sailing ships that were converted to barges. The color photo gives a nice view of a "salty" a seagoing ship that was sized to fit the St. Lawrence.

of the lock. This was old Route 2, section of which became a victim of the Seaway. As you can see from the photo below, the road was also main street of the village of Iroquois. Many times in the march of progress, people find themselves in the way and are told that they will need to move.
From a 1955 paper…

Town Victim of Progress

Iroquois, Ontario– The town council has scrapped plans for an "Old Home Week" next July, because everyone will be too busy getting ready for the new. The townsfolk already are planning and even packing for July 1956 when they become guinea pigs in Canada's most ambitious resettlement project. Iroquois will become a victim of progress. The multi-million dollar St. Lawrence Seaway will pass right through it, and the entire community will be flooded. About half the homes, stores, and other buildings in the town will disappear beneath the water. The rest will be moved to a new town site, a mile to the north. The old and new towns are fast becoming a test case for similar operations in "Seaway Valley".

Some of Iroquios old homes, here since the present town was founded as Cathcart in 1857, will be moved as they stand. Other– new ones paid for by the Ontario Hydroelectric Commission which will use the 18,000 acre lake that now is Iroquios, will spring up. Some are already built. Anyone who hasn't been here might be justified in thinking the "big move" has the town in an uproar. They would be only partly right. There is a sort of frenzy. But most of the street corner and drug store talk still centers around the standing of the local baseball team. The baker still makes bread. Teenagers meet at the store, and youngsters trade comic books as usual. The hardware store still has an occasional customer for a new doorbell or a bag of grass seed. The butcher shop is busy as ever on pay nights.

But behind the small town bustle at least two things show the people of Iroquois are getting ready to move. Homeowners are reluctant to buy new furniture, and the remark is heard that it's time something seldom used was packed or crated.

The other sign is the council meeting, where the mayor reports on latest negotiations with "the hydro" for compensation. Reeve (Mayor) Lloyd Davis said the townspeople are winning what only a short time ago seemed to e a losing battle to have the commission provide for the new Iroquois which they envisage as a town of 40,000 population. The council already has picked out street names. The main street of the new town will be called Queen in honor of Queen Elizabeth II. The biggest argument over moving Iroquois has so far revolved around money. Hydro authorities figure on settling for the valve of expropriated property plus the cost of moving and rehabilitation, and a 10 per cent "inconvenience" payment. However the "inconvenience" money is to be withheld until people actually move to the new Iroquois, as a safeguard against anyone pocketing the money and going elsewhere. Many folks contend they should get the special payment anyway, because no matter how you look at it being forced to move anywhere is an inconvenience. Troy (NY) Times Record, May 4, 1955

In all 6500 people had to be relocated during the construction of the Seaway, and the villages of Aultsville, Dickinson's Landing, Farran's Point, Maple Grove, Mille Roches, Moulinette, Santa Cruz, Sheek's Island, Wales, and Woodlands ceased to exist. Iroquois was relocated about a half mile north and parts of, but not all Morrisburg were moved.

The Deep Cut at Cardinal

Locks 26 and 27 were located at Cardinal, a small village that sits on a hill that juts out into the St. Lawrence. To follow the river, the Cardinal Canal had to follow this bend which was severe enough that it hampered sight distances for boat captains. In 1900, it was decided to eliminate this bend by digging straight through the hill in a deep cut. This would also eliminate Lock 26 and improve the approach to Locks 27 / 28.

A postcard view of the new deep cut and a later view of the cut with the Westcliffe Hall passing through.

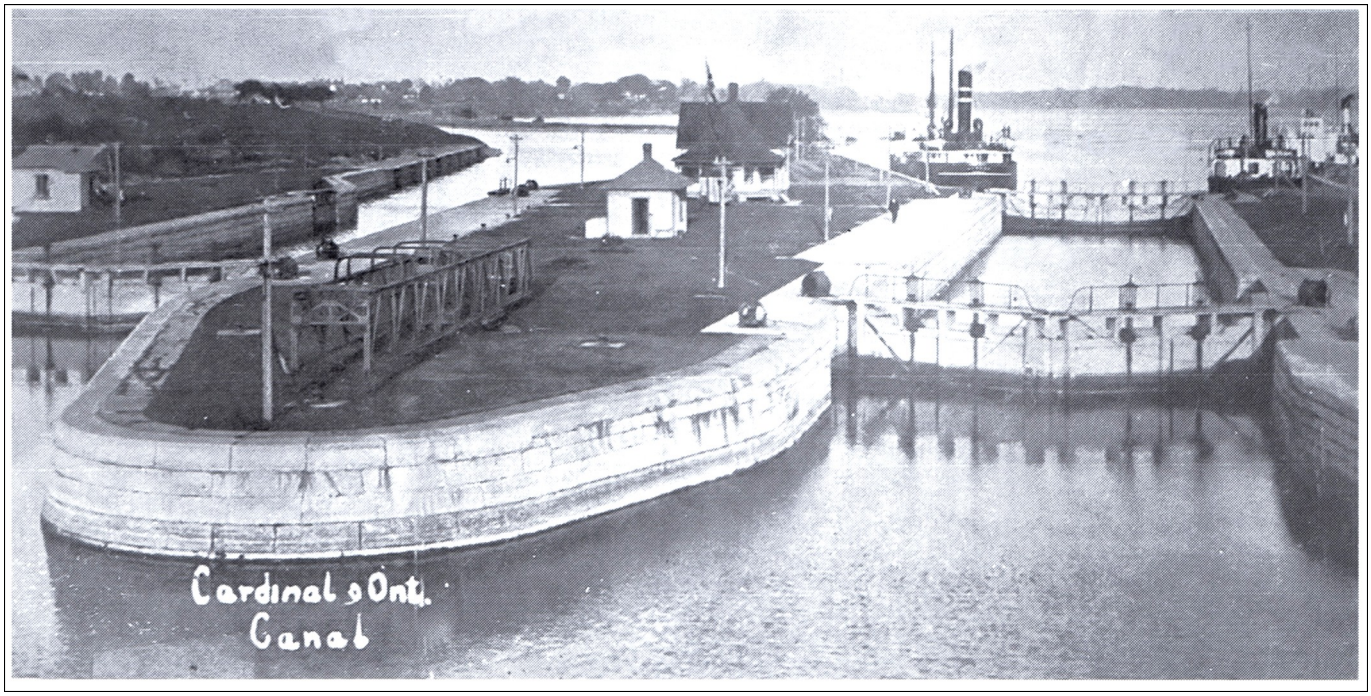
Locks 27 / 28.

Locks 27 / 28 mark the western end of the St. Lawrence canals. The locks help to create a safe channel of slow moving water to the west, which downstream boats could enter to pass around a section of fast and rough water. The boats could safely reenter the river by passing through Lock 28, where they would follow a marked channel that would take them through the Galop rapids. Upstream boats would have entered the canal at Lock 25 and bypassed the rapids, and stepping up to the level of Lake Ontario by passing through Lock 27.

Locks 27 and 28.

The ship in the top photo is headed downstream. It has used the western sections of the Galops Canal to pass around the worst of the Cardinal and Galop rapids. Here it is reentering the river here by passing through Lock 28 and will run the river until reaching the Cornwall Canal.

The lock to the left is Lock 27. It is the western most lock on the Galops Canal, which allows up stream boats to pass around the faster water in the river.



The Boats of the St. Lawrence*

In our study of canal history, we are influenced by the available photographs. For the Erie Canal, the boats we see are from the enlarged and the barge canals, since the advent of photography post dates the first Erie Canal. The same seems to hold true for the St. Lawrence, as many photographs are available for the later years showing the "canalers", yet few exist from the late 1800's.

Early boats on the St. Lawrence were sailing vessels suitable from both the canals and the lakes. (Think of the Lake Champlain sailing / canal boats) In some photos we catch a view of these boats, although modified as barges and accompanied by tugs. The photo we show here was taken at Soulanges Lock 5 after the turn of the 1900's. These early boats were limited by the dimensions of the locks on the Welland Canal to 135 feet long. The typical load was 350 tons. For boats that only used the St. Lawrence and Lake Erie, the length could be 185 feet with a capacity of 750-800 tons. River barges were also used to bridge the canals between Kingston on Lake Ontario and Montreal. River barges carried 750-800 tons. Both of these would be towed by teams or tugs through the canals.

Postcards show paddle wheel boats shooting the rapids; an exciting way to envision the difficulties presented by the river and highlighting the reason for the canals. The early locks on the Cornwall Canal were 55 feet wide to accommodate the side bays of the paddle wheels. This was later reduced to 45 as the locks were standardized and paddlewheel boats gave way to propeller driven boats.

Launched in 1841, the Vandalia was the first screw propeller vessel used on Lake Ontario, but it wasn't until 1880 that steam boats began to replace the sailing vessels. The boats that passed through the St. Lawrence Canals were called "canalers", since as is true today, they were sized to fit through the locks. These boats were seaworthy for use on the open waters of the Great Lakes as well as for coastal navigation. There were larger boats on the Great Lakes that could not pass through the St. Lawrence locks, and this remains true even today.

* The definition for a ship verses a boat is that a boat can be carried by another larger vessel, typically a ship. However, the use of "boat" instead of ship for describing vessels on the Great Lakes is one of tradition.

Canalers were designed to maximize the amount of boat that could be squeezed into a lock. They were restricted by the narrowest lock on the system, in this case it was Lock 17 on the Cornwall Canal at 43 feet, 8 inches. The forward pilot house allowed for the captain or pilot to see the lock gates as they entered the lock chamber. They had a capacity of around 2000 tons.

In a enlarged Erie Canal world (1862-1917), a self propelled boat carrying 2000 tons was far superior to the horse drawn boats of the Erie with a tonnage of 200 tons. This might be a reason that the capacity of the NYS Barge Canal was increased from 1000 to 2000 tons during the design phase.

It must be noted that although the St. Lawrence boats look larger than the motorships used on the NYS Barge Canal, both carried equal amounts of cargo. The locks on the NYS Barge Canal are 328 by 45 by 12, slightly larger than the 270 by 45 by 14 of the St. Lawrence locks. The major difference came about from the bridges on the Barge Canal which limited overhead clearance to 20 feet, whereas bridges on the St. Lawrence were designed to swing out of the way. As seen here with the Transoil and the Day Peckinpaugh, the motorships were designed to fit what was available. However this limited the boats usefulness in open waters, both in terms of having a high vantage point to navigate, and to be seen by others. Yet, In terms of cargo capacity, both were very similar.

Further Reading

ORIGIN OF THE CORNWALL and WILLIAMSBURG CANALS.

Paper Written by MRS. L. N. RHEAUME,

And Read at the Monthly Meeting of the Women's Canadian Historical Society o/ Ottawa, On the lOtK o/ January. 19O8.

The Cornwall Canal is situated on the North shore of the St. Lawrence. It extends from the Town of Cornwall to Dickinson's Landing, a distance of eleven miles, and was built to overcome the "Long Sault" rapid. This rapid is the greatest of the really remarkable ones of the St. Lawrence River, being nine miles long.

The St. Lawrence, or, as they called it formerly, " La Grande Rivire," was the original first route followed by the French explorers on their way to Lake Ontario, called then " Skaniadona" (an Indian name for Ontario). These names are recorded in a map preserved in the Imperial French Library. As Jacques Cartier entered the bay on the l0th of August, 1535, he gave to the river the name of the Saint whose festival is celebrated by the Church on that day, and called it St. Lawrence. The French explorers also gave the names to the other rapids, but I will only mention those in connection with my subject.

The "Long Sault" literally means a long water fall. The next in order is "Rapide Plat", meaning a flat rapid; and the third, "Les Galops", signifies a swift or galloping current. These names have almost lost their original signification by being either mispronounced or misspelt. For instance, you will hear generally, or see in print, ' The Long Soo" instead of "Le Long Sault", " Rapid du Plate" for "Rapide Plat," "The Galoose" instead of "Les Galops." It is to be regretted that these descriptive names should thus lose their signification.

Smith, in his description of Upper Canada, 1799, describes the navigation of that time as being in a very primitive stage. The river was very dangerous because of its numerous rapids and the entire absence of canals. The only means of conveyance was by canoes, or batteaux. The batteaux were about thirty feet long, flat at stern and bow. The crew consisted of a captain and five or six men, who pushed the boat up the stream with long wooden poles, whose points were protected by iron. When the current was too strong for them to make headway, some of the men would go on shore and tow the boat up with a rope, two remaining on board to steer and keep her off the shore. The captain stood in the stern and steered with a large paddle. Each batteau had a moveable mast and a square sail.

This mode of navigation continued till 1809, when the Durham boat came from the Mohawk River. It was somewhat larger and more powerful than the batteau, and to a certain extent supplanted it, as a means of conveyance. The bow of the Durham boat was round and the stern square. It was steered with a long rudder, had a stationary mast, with a main sail, jib and top sail, and it was fitted with a slip keel or centre board.

The mode of conveying merchandise from Montreal at that time, was by cartage as far as Lachine, thence by boat to Kingston, which was then the head of the boat service. The goods were then transhipped into schooners for transport up through the lakes. Very small canals had been built to overcome the worst part of the "Long Sault" and "Galops" rapids. The boats were towed by oxen or horses, the goods being first unloaded and carted to the head of the rapid.

The lots in the front concessions were surveyed into narrow strips, in order to secure a water frontage for as many as possible, because there was then no other means of transit than by water. Most persons going to Montreal from Cornwall took passage on batteaux in preference to driving. The traveller would have to wait at the river bank until a batteau hove in sight, when he was paddled out in a canoe to meet it. A bargain was struck with the captain, and the traveller was then made as comfortable as the means of the boat crew would allow. There were no berths and each one was obliged to provide his blankets and food. The batteaux were manned by French-Canadians, and it was both picturesque and pleasant to hear them sing their songs, as they plied their oars and their boats glided down the river.

Caniff, in his History, relates a;i account of the experience of a clergyman crossing the St. Lawrence from St. Regis (an Indian settlement) in 1811. To use the clergyman's words, he says: "We crossed the St. Lawrence in a most romantic style. We hired four Indians to paddle us over. They lashed three canoes together and put our horses in them, their fore feet in one canoe and their hind feet in another. It certainly was a very singular sight. They were to take us over for three dollars, as the distance was nearly three miles; but when reaching Cornwall the Indians claimed an extra dollar, saying that they could not easily divide three into four. This was cheerfully given, and we were only too happy to have reached shore safely."

In 1814-i825 a small boat was placed between Cornwall and Coteau du Lac. In 1818-1829 the next steamboat was the "Neptune." The steamboats of the olden days were very different from those now in use. They had no saloons or cabins on .deck for passengers. The gentlemen's and ladies' cabins were both below the deck, the latter being in a small apartment at the stern of the boat. The passengers' meals were served in the gentlemen's cabin.

In 1830 the steamboat "Iroquois" began to ply between Prescott and Dickinson's Landing. She was replaced in 1832 by the "Dolphin," a larger and more commodious boat. The use of these boats did away with the stage drives between Prescott and Dickinson's Landing, leaving only twelve miles of a drive to Cornwall.

As far back as 1817, the Governor of Upper Canada, in his speech at the opening of the Legislature, called the attention of Parliament to the important question of navigation below Prescott. In 1818 a Joint Commission was appointed by the Governments of Upper and Lower Canada, which commission reported in favour of improvement. The question, however, remained in abeyance, and it was not till the 13th of February, 1833, that the improvement of navigation was authorized by

the Statute 3 William IV, Chap. 18, under which a sum of 70,000 was to be raised by a loan, not exceeding five per cent., for that purpose, and the following gentlemen were appointed Commissioners to carry the Act into effect: The Hon. Thomas Clark, Hon. Judge Hamilton, Philip VanKoughnet, Jonas Jones, Hiram Norton, George Longley and Peter Shaver. The Act directed that the improvement should begin and be finished between the head of the "Long Sault" and Cornwall, in the Eastern district, before any money could be laid out for the improvements in any other parts of the River St. Lawrence. The Commissioners entered at once upon their duties, caused further surveys to be made and adopted the line in which the canal now runs.

The services of Mr. J. B. Mills, Royal Engineer, were secured. In December of the same year, Mr. J. B. Mills made the report of the first survey to the Board of Commissioners, to ascertain whether it was practicable to improve the navigation of the St. Lawrence in such a manner as to accommodate steamboats and other vessels, by means of one or more canals, between Montreal and Prescott. He says in his report: "The estimated distance between Montreal and Prescott is 134 miles; 103 miles is good for steam navigation, and 31 miles needs improvement, of which 15 miles is in the Upper Province and 15 miles in the Lower." (Montreal, Dec. 3rd, 1833.)

In another report Mr. Mills says: "The St. Lawrence is opened two or three weeks earlier in the Spring and Fall than the Ottawa. The St. Lawrence passing through a more Southern latitude, these two or three weeks in Spring and Fall are the most important in the whole year for navigation traffic." (I have transcribed the above Reports from the original manuscript, kindly shown me by Dr. Doughty, Dominion Archivist, at the Archives.)

The first sod was turned by Chief Justice Robinson in the Autumn of 1834, at a spot near the mouth of the old lock. Twenty-six contractors were awarded different sections. I will only mention a few: Robert and Wm. Hervey, Charles Kerr, Jas. Rogers, Jas. Dixon, Jas. Crawford, and Thompson, Simms, Fraser, and others. The engineers in charge were: Mr. J. B. Mills, Royal Engineer, and Mr. Benjamin Wright, of New York, as Consulting Engineer.

These gentlemen determined on the dimensions of the canal, as follows: Length, \\% miles. Breadth at bottom, 100 feet; breadth at top, 150 feet. Depth of water on sills, 9 feet. Number of locks, 7. Length of lock, 200 feet ; width, 45 feet. Total rise in lockage, 48 feet.

In March, 1836, Mr. Mills, resigned in consequence of disagreement between the Commissioners and himself, and Captain Philpotts, Royal Engineer, succeeded him.

Work was suspended in 1837, owing to the embarrassed state of Provincial finances, as well as the Rebellion, and was not resumed till after the Act uniting Upper and Lower Canada in 1841. The canal was not completed until 1842, when it was opened for navigation. The steamboat "Highlander" was the first of the mail boats that passed up the canal.

The postal service in the newly settled part of Canada did not afford much facility for correspondence at that time. The carrying of letters by private individuals was punished by a fine, as it diminished the public revenue. Occasionally an order would be issued, warning the public, but notwithstanding this, friends would entrust their letters to parties who were travelling to places to which these letters were addressed, but in this primitive way they did not always reach their destination. Pringle, in his "History of Lunenburgh," says : "When the old English Church in Cornwall was demolished, they found under one of the pews: two letters that had been entrusted, sixty years previously, to a gentleman to be delivered to friends in Quebec. The high rate of postage had no doubt a great deal to do with the persistency of the people in sending their letters by friends." At that time the management of the Post Office in Canada was under the control of the Imperial Government, and remained so till 1850.

After the canal was opened for navigation, the people of the town found that having no access to the river except through the culvert, was intolerable. Petitions were sent to the Board of Public Works. The Hon. H. H. Killaly, President of the Board, came to Cornwall, and after an examination consented to build a bridge, which was completed in 1843.

The Cornwall Canal has had two periods of enlargement. Tn 1876, a new cut was made and two new locks were built South of the town, and completed in 1882. Between 1884 and 1903, the second period of enlargement took place, when the canal assumed the following dimensions: Length, n miles. Number of locks, 6. Dimensions of locks, 270 feet long by 45 wide. Total rise in lockage, 48 feet. Depth of water on sills, 14 feet. Breadth of canal at the bottom, 100 feet. Breadth of canal at water surface, 164 teet. The equipment of the locks with electrical machinery was completed also in 1903. There are 230 arc lights situated along the bank of the canal; they are located 400 feet apart, which makes navigation at night as easy and pleasant as in day time The equipment for opening and closing the gates, as well as the bridges, is operated by electricity. The hundreds of maple, elm, willow and birch trees on the South side, and the brilliant lights on the canal banks, make a decided contrast with the days of the origin of its construction. The cost of the Cornwall Canal has been $6,963,299.

Above the Town of Cornwall the New York & Ottawa Railway bridge may be seen. This is the only bridge spanning the St. Lawrence, which joins the United States to Canada.

The trip Westbound from Cornwall to Prescott by canal, gives a magnificent view of the river and rapids on the left, as well as numerous islands, and on the right is a beautiful landscape dotted with so many pretty villages, towns, and most charming and costly residences.

THE WILLIAMSBURG CANALS.

Williamsburg was named after William Henry, Duke of Clarence, who in 1831 ascended the Throne of England as William IV. He visited Canada in 1787.

These canals are situated on the North shore of the River St. Lawrence, and were constructed chiefly to overcome the "Galops" rapids and others of less importance, as well as certain stretches of swift water. Although called collectively the Williamsburg Canals, they are situated in three different counties Stormont, Dundas and Grenville.

The first of the series, in ascending order, is Farran's Point, about four and a half miles West of Dickinson's Landing, the head of the Cornwall Canal. This canal was first built in 1847 for nine foot navigation. In 1897 a contract for enlargement was given, which was completed in October, 1902. The dimensions now are: Length of canal, \ l /t miles. Number of locks, 1. Length of lock, 800 feet, by 50 wide. Total rise in lockage, 4 feet. Depth of water on sills, 14 feet. Breadth of canal at bottom, 90 feet. Breadth of canal at water surface, 154 feet. This canal was extended to Empey's Bay.

Between Farran's Point and "Rapide Plat," or Morrisburg Canal, there is on the shore to the right as you ascend, a grey stone monument, which commemorates the Battle of Crysler's Farm. May I be here permitted a digression and allowed to recall the memory of those heroes of the Revolution of 1812-1813, who gave up their lives in defence of their country? It was on that very spot that on the I ith of November, 1813, the Battle of Crysler's Farm was fought between the British force of about 900 men under Colonel Morrison, and a portion, of Wilkinson's army, between 2,0x1 and 3,000 strong, under General Covington. The British gained a complete and signal victory, and the Americans retreated with a loss of about 93 killed, among whom was General Covington, and 237 wounded. The victory at Crysler's Farm over Wilkinson's army, and that at Chateauguay under de Salaberry over General Hampton's force, completely broke up the well, conceived plan of the Americans for the capture of Montreal.

The second of the series is "Rapide Plat." This canal is situated about nine and a half miles West of Farran's Point, and extends from the pretty Town of Morrisburg to Flagg's Bay, almost opposite Ogden's Island (an American island, noted for having been the scene of several skirmishes during the war of 1812/1814.) The first surveys of "Rapide Plat" were made in 1843. The works began in 1844 and were completed in 1847. This canal was intended for vessels drawing nine feet of water, and the enlargement to the 14 foot draught was commenced, in 1884. The building of a new lock was completed in 1904. The dimensions of the canal are: Length, 3%" miles. Number of locks, 2. Dimensions of locks, 270 feet long by 45 wide. Total rise of lockage, \\y 2 feet. Depth of water on sills, 14 feet. Breadth of canal at bottom, 80 feet. Breadth of canal at surface of water, 152 feet.

From the head of "Rapide Plat" Canal to Point Iroquois, the distance is a little over four miles. Midway, opposite "Pine Tree Point," is the narrowest part in the whole of the river, from the Gulf of St. Lawrence to Niagara, being only 390 yards wide. One could hardly realize it possible, when travelling by boat and seeing this narrow stretch of water, that we are navigating on the largest river of our continent. Opposite Kingston, for instance, the width is lo^i miles, from shore to shore. This part I am alluding to includes Wolfe Island.

The third division of the Williamsburg Canal embraces Iroquois and the "Galops." What is now known as the "Galops" Canal was originally built as two separate canals, with a short distance of navigation between these were also opened for a nine foot navigation in 1847.

The lower section, called Point Iroquois Canal, commenced at the Village of Iroquois and extended to Piesqu' Isle. It was three miles long and had a lockage of five feet seven inches, which overcame the rapid of Iroquois Point. This point is most picturesque and is said to have been a favorite spot with the Indians when holding their councils of war.

When Father Pierre Potier, one of the Jesuit Missionaries, was journeying from Montreal to Detroit in 1744, by canoe, he wrote in his diary the places of interest or landmarks that he passed from the 1 7th to the first of July. He noted that he had camped the night of the iyth at Iroquois Point, and remarked that it was "un bel endroit" (a beautiful spot.)

The upper or Western section, known as the "Galops," commenced at the Village of Cardinal and extended up stream to the head of the "Galops" rapids. It had a lockage of six feet eight inches, and surmounted the Cardinal and the "Galops" rapids.

About ten years after the completion of these canals, they were connected by an embankment, otherwise called the "Junction Canal," built in the river, and other improvements were made, so as to increase the total length of the canal to "] l /2. miles and the lockage to 14 feet 7 inches.

In 1888 the Government entered into a contract for enlarging the upper entrance, the work consisting of building a new lift-lock, as well as a guard-lock, each 270 feet long by 45 feet wide.

In 1897 work on the enlargement of the Iroquois section was commenced and consisted in building a new entrance channel, two entrance piers, and a "flottila" lock of 800 feet by 50 feet wide, thus deepening and widening the canal for about three and a half miles. An electrical cable was also placed under the canal, and the work was completed in 1902.

In 1898 it was decided to widen the entrance to the existing channel, South or towards Adams Island, with a view to eventually increasing the width to 300 feet, which is now completed. The cost of the Williamsburg Canals is $9,567,077.

The North channel commences about one mile West of the upper entrance of the Galops Canal, and extends in a straight line to Chimney Island, a distance of two and one-third miles.

(These notes are authentic, having been secured from the archives of the Jesuit Order in Montreal, who have in their possession most of the original manuscripts relating to Canada, where their missions were conducted during the French regime.)

The present degree of perfection in our canals was not attained at one bound, as they had several periods. The history of each one would require a very extended notice, if the military, political, commercial and financial aspect of the ques-

tion, as well as the engineering difficulties, were to be considered. Suffice it to say, that our present engineers and explorers are only following in the footsteps of the men of genius and science, who first blazed the pathway to the interior of our country and made the great St. Lawrence River the highway of our national transportation. The results of their intelligent and patient labor are enjoyed by us today, and we should therefore be proud of them and our common country which have produced such men.

C. E. RHEAUME.
University of Toronto Library

The Evening Post
November 28, 1899
The New St. Lawrence Canal Locks

Size of Vessels That Can Now Pass Between the Great Lakes and Sea
A Great Naval Advantage for England
The Locks Being Fortified

Washington November 27

The naval authorities are advised that the new St. Lawrence River canal locks have been opened during the past ten days, and that it is now possible to take through the St. Lawrence canal system any vessel which can be got through the Welland canal. Practically the first steamship having a length in excess of the limit imposed by the old locks to pass through the new system is the Porto Rico, built by the Craigs of Toledo. The Porto Rico arrived at New York only a few days ago. She has a length of about 250 feet. No trouble of any kind was experienced in getting her down from the Great lakes. The new locks are intended to take vessels of 270 feet length. This limit is imposed by the shortest lock in the system near the old Cornwall Canal. Until recently the maximum length admitted in the St. Lawrence River locks was 186 feet. On a pinch a length of 187 feet could be got through by placing a vessel diagonally in the locks. Only a narrow beamed vessel however, would admit of such laying.

In 1899, when the authorities were anxious to add the revenue cruisers Gresham, Onondaga, and Algonquin, all lake built cutters, to the naval force in Cuban waters, it was found necessary to cut those vessels in two, bulkhead up the ends, and take the craft through the lock systems in sections. The connecting-up work was effected at Montreal. The Gresham and her sisters did not exceed 205 feet in length.

One direct result of the opening of the new St. Lawrence River locks will be the shipment of large quantities of freight by water to the seaboard. The canal management is prepared to undertake next season, the handling of large number of ocean going steamers.

The new system, it must be understood, is wholly in English hands and advices state that the British authorities have planned a battery defense for every lock in the system. It is recognized that from a military standpoint Great Britain has suddenly acquired an immense advantage in the North. An examination of her navy lists ahows that nearly 146 modern ships of war are now able to carry the British flag from the Atlantic into the waters of the Great Lakes. So long as the United States and Great Britian remain on friendly terms the foregoing fact may not cause embarrassment but it is recognized that with batteries growing up around each lock on the St. Lawrence River the English, at any rate are not taking chances. Whatever argument held good in the past, officers say, for the defense of the important lake ports holds doubly good now. Whereas Great Britain before the opening of the new locks, could only pass gun vessels and torpedo boats in to the Great lakes, to-day she can send thither heavy cruisers and even a number of turrent and iron-clad ships. The opening of the new locks makes England absolutely master oof the Great Lakes. All talk and speculation of a possible destruction of the canal locks in event of war os declared by military men to be idle. England is preparing to defend the new with as much determination as if they were naval bases, and the proof of the assertion is to be found in her battery plans.

In view of the immense superiority suddenly acquired by the English, it is thought not unlikely that the old agitation may soon again break out calling for an abrogation of the 1814 treaty*. Under the spirit of the treaty provisions ship and engine builders on the Great lakes have been prevented in the past from undertaking was-ship construction work. The new naval bill calls for twelve gun vessels of 1000 tons each. All of these ships could be built on the Great lakes, and conveyed thence to the seaboard through the new St. Lawrence River canal system. It is generally conceded too, that ship work as a rule is cheaper in the Northwest than on the seaboard. The building at a lake port of the Porto Rico, an ocean going steamer, indicates that the cheapness of lake work is recognized on the seaboard. Heretofore the small size of the locks has prevented the placing of many coast orders with lake firms.

*[ed] This refers to the Rush—Bagot Treaty which was signed after the War of 1812 which demilitarized the boats and forts around the St. Lawrence and Great Lakes.

The St. Lawrence Republican
From Duluth to Tide Water
May 27, 1871

So much interest is now taken in the Northern Pacific Railway, and having heard to many questions asked about Duluth and the passage to the seaboard, I think the following distances and route may be of some interest to your readers. Let's start at Duluth and go towards the sea. Duluth is at the western extremity if Lake Superior, which is 600 feet above the sea level. From Duluth to St. Mary, the outlet of Lake Superior, is 420 miles. There is a canal one mile long with two locks and a fall of 19 feet. From the foot of this canal to Lake Huron is 54 miles, with a fall of 8 feet. From the mouth of St. Mary's River to River St. Clair, through Lake Huron is 270 miles, [the] depth of Lake Huron [is] 450 feet. From the entrance of St. Clair River to Lake St. Clair is 33 miles, [with a] fall 6 feet. Lake St. Clair is 25 miles to entrance to Detroit River, [the] depth of St. Clair 15 feet. Down [the] Detroit River to Lake Erie is 18 miles, [with a] fall of 4 feet. From the entrance of Lake Erie to Port Colborne, [the] entrance of Welland Canal, is 220 miles, [and the] depth of Lake Erie is 90 feet. From Port Colborne to Port Dalhousie, through the Welland Canal is 27 miles with 27 locks [totaling a] fall 330 feet. From Port Dalhousie to Kingston, [the] foot of Lake Ontario is 160 miles. [The] depth of Lake Ontario, 412 feet, [and the] elevation above tide water 234 feet. From Kingston to the head of the Galloups Canal, about 5 miles below Ogdensburg, is 76 3/8 miles [of river navigation, with a] fall 6 feet. The Galloups Canal is 7 5/9 miles long, [with] 3 locks, [and a] fall 15 3/4 feet. From the foot of Galloups Canal to the head of Rapid du Plat Canal is 4 1/2 miles [of river navigation with a fall of] 3 3/4 feet. [The] Rapid du Plat Canal is 4 miles long, 2 locks, [with a] fall of 11 1/2 feet. From thence to the head of Farran's Point Canal is 10 1/2 miles [of river navigation, with a] fall of 2 3/4 feet. [The] Farran's Point Canal is 3/4 mile long, [with a] fall 4 feet. [From] thence down to the head of Cornwall Canal is 5 miles [of river navigation, with a] fall one feet. [The] Cornwall Canal is 11 1/2 miles long, [with] 7 locks, [and a] fall 48 feet. From the foot of Cornwall Canal to the head of Beauharnois Canal is 32 3/4 miles [of river navigation with a], fall 1 4/10 feet. [The] Beauharnois Canal is 11 1/4 miles long, 9 locks, [with a] fall 82 1/2 feet. Thence through Lake St. Louis to the head of Lachine Canal is 13 1/4 miles, fall 1 1/2 feet. [The] Lachine Canal is 8 1/2 miles long, 5 locks, fall 44 3/4 feet; which brings us to Montreal. From Montreal to Three Rivers, head of tide water is 66 miles, [with a] fall 11 feet; showing a fall since leaving Duluth of 600 feet. Distances, 1493 miles, comprised of Lake navigation, 1096 miles, river 325 miles, canal 72 miles.