
President's Message

Greetings to all, and I hope that you have weathered the winter! Now it is time to think of other things, such as C.C.S. meetings and field trips.

Just a word to say that the **Annual Meeting** of the Society will be held on **Saturday, 28 May, 1994**, with the main business being the ratification of the proposed amendments to the Society's constitution, and the election of a new slate of officers for 1994. The field trip will be a cruise around the **Buffalo, N.Y., harbour** on board MISS BUFFALO II, and we look forward to an interesting view of the harbour, lake and Black Rock lock. There will also be a visit to the Naval Park and a U.S. battleship. Please make a note of this date and plan to attend. Details will be sent nearer the time.

As to news about our projected U.K. trip in 1996. First, my thanks to all the members who applied to the very long very detailed questionnaire. It was perhaps a little intimidating, but the replies did give the Travel Committee a better idea of members' expectations and preferences. The month preferred seemed to be June, and two weeks appeared to be the optimum time for canal-oriented activities. The most important sights (and sites) were canal and waterways related. The Travel Committee, in close touch with Ron Oakley, of the Inland Waterways Association of Great Britain, is now trying to co-ordinate times and places when our Society could join in with other groups at special events, and options are being worked out. Now, of course, the next step is to ask members for commitment to this project, so that airline times, hotel and boat rentals can be organized. I urge interested members to fill in and return the enclosed form, prepared by the Travel Committee (and see story, p. 3).

Best wishes for a successful C.C.S. year!

Sheila Wilson

Peterborough 20-23 September 1994 - International Historic Canals Conference

Notice has been received that the Trent-Severn Waterway of Parks Canada will host the International Historic Canals Conference in Peterborough, Tuesday 20 Sept. to Friday 23 Sept. 1994. This will coincide with the 90th anniversary of the Peterborough Lift Lock. It had been hoped that the C.C.S. could plan to be there, but since the event is not on a weekend, that appears difficult to arrange. C.C.S. members are, of course, welcome to attend on an individual basis. Further information from Trent-Severn Waterway, Parks Canada, P.O. Box 567, Ashburnham Drive, Peterborough, Ontario, K9J 6Z6.

Map of European Inland Navigation

Reminder! We still have copies of this newly-published map, which should appeal to anyone interested in European inland navigation. Designed and published in France and England, it is the only map available with comprehensive information about such inland waterways on a single sheet. Showing special features, navigable waters and canals, as well as historic ones, it is well worth buying for general interest, or for a gift - especially interesting if you plan to go to the UK or Europe! The CCS has ten copies available for members, suggested price about \$15.00. Nice Christmas gift! - see detail on p. 2. Copies may be ordered (supply is limited!) from Sheila Wilson, 158 Ontario St. Apt.701, St. Catharines, Ont., L2R 5K6.

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C.C.S. Logo

Members will recall that we asked for suggestions regarding the possibility of changing our logo, on the grounds that the packet boat is not truly representative of Canadian canals. Since we had very few comments from the membership, and those were in favour of retaining the present logo, the C.C.S. Board has agreed to retain the current logo at least for the time being. With the trip to the U.K. coming up, perhaps we should once again consider the fact that, while the packet boats did ply the Welland Canal for a time, there is no evidence that they were ever in service on any other Canadian canals. Those of us living in the Niagara area naturally focus on the Welland (and rightly so!), but the C.C.S. must not forget that it purports to be "Canadian" and that our logo should, if possible, in some way reflect that wider context. The U.K. tour would certainly be an opportune time to have a new logo available.

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Rideau Watch - "Talking up the St. Lawrence"

Members who have had the pleasure of using the Rideau Watch's "Talking up the Ottawa" and "Talking up the Rideau" will be delighted to know that Gordon Cullingham has produced the companion work, "Talking up the St. Lawrence." Details re cost, ordering, etc. can be obtained from:

Rideau Watch
P.O. Box 196, Station B.
OTTAWA, K1P 6C4
(613) 236-2502

[The Editor's sincere apologies to both Gordon Cullingham and Walter Webb, who sent me the notice, for not mentioning this earlier. I had good intentions, and in fact thought that I had put in a notice last fall! Better late than never, I trust — and in good time for this summer's activities.]

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Turf-sided canal lock will hold water again

The Garston lock, built in 1720 at the eastern end of the Kennet and Avon canal near Reading, Berkshire, is being restored by British Waterways. Instead of timber-sided lock walls, the engineers simply laid turf up the sides of each bank! In addition to reinforcing the flooring and wall struts, and providing new lock gates, today's engineers are growing special grasses and water meadow flowers, able to survive regular flooding and silting, on a synthetic carpet, to form the walls. [The Times, 21 Feb. 1994]

C.C.S. U.K. Tour in '96

The C.C.S. tour is being planned to coincide with some of the 50th anniversary celebrations of Britain's Inland Waterways Association. Members will recall receiving a copy of World Wide Waterways in which the possibility of establishing an International Waterways organization was discussed. It is now expected that this organization will be active very shortly, and it is hoped that their first international meeting will be held in Britain in conjunction with the 50th anniversary celebrations. The tentative date for that meeting is 22-23 June 1996, with groups from Britain's IWA, Irish waterways, as many of the American canal societies as possible, and representatives from France, Germany and perhaps Australia, in attendance. It is intended that activities on the 22nd will include the presentation of a number of papers on waterways topics, as well as social activities to enable members from the various groups to meet and compare notes. A field trip will be organized for the 23rd.

It was in view of a) the desirability of having representatives at that inaugural meeting from as many foreign groups as is possible, and b) your responses to our first questionnaire, that the Travel Committee made the provisional arrangements indicated on the enclosed form, which we urge you to fill out and send in as soon as possible.

As indicated on that form, we will be sending out a further questionnaire, giving possible methods of transport, "ports of call," types of accommodation, etc., with suggested price ranges (members must remember that these will of necessity be based on current prices, and may change by '96!). The Committee will make all arrangements for the two-week tour only, but will be happy to provide advice and suggestions for an optional third week's activities.

The Committee will, of course, provide "progress reports" at intervals, as plans become more definite. And once our plans are finalized, we will also provide suggestions as to "what to pack" - always a concern on such concentrated tours. We will be compiling a "kit" for each member, with information on sites to be visited, and will also take along a different sort of "kit" for our various contacts while on tour, with information on our Canadian canals and waterways (oh yes, and membership forms for the C.C.S.!).

Sign up now, and start saving for our biggest-yet field trip!

Bobbie Styran, for the Travel Committee

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Canals of L.A.

After 50 years of decay and delay, controversy and teeth-gnashing, the old Venice canals in Los Angeles have been restored. The six canals, which officially reopened on Oct. 19 [1993], have been dredged, sidewalks and bridges rebuilt and — in the most hotly debated part of the protracted project — the banks lined with special sloping blocks that are supposed to allow natural wetlands plants to grow and children to climb out if they fall in. Many residents along the canal wanted vertical walls for esthetic reasons, but such walls were ruled out because they are not amenable to plant growth. The \$6-million [American] restoration has given new life to one of the oddest and most appealing parts of Los Angeles, 19 kilometres and world away from downtown.

[Reprinted from the Globe & Mail, 18 Dec. 1993]

Other Canals

[**Editor's Note:** This is the ninth installment from a paper entitled "The History of Canadian Inland Navigation System," presented to the Canadian Society of Civil Engineers Centennial Conference in Montreal, May 1989. The authors, C.C.S. member **Walter Webb** and E. Dumalo, have graciously agreed to the use of parts of the paper in Canals Canada.]

In the 19th and 20th centuries there were a number of other canals and canal projects some of which are briefly mentioned here.

On the Ottawa, a lock was completed at St. Annes in 1843 and the "military canals" were enlarged. There was also interest in the route to the Great Lakes via Ottawa. A survey was made in 1855 by Walter Shanley, an eminent civil engineer. Finally, the "Report upon the Survey for the Georgian Bay Ship Canal" was prepared in 1908. However, the St. Lawrence route won out and this grand scheme was not realized.

On the Richelieu, the Chambly Canal and a lock at St. Ours were built between 1831 and 1849. This connection with the American Champlain Canal (completed in 1825) was never enlarged although right up to the 1960s there were proposals for a canal from St. Johns to the Laprairie Basin — a distance of only some 12 miles (20 km) to bypass these locks and provide a direct connection to Montreal.

The Murray canal was built between 1882 and 1889 and the Trent system was built in stages between 1833 and 1920. The Trent had some innovative marine railways and two lift locks. The lift lock at Peterborough was a major engineering achievement. Based on European prototypes, it was designed by two Canadian civil engineers, Canal Superintendent Richard B. Rogers and W.J. Francis. The work was carried out by contract with the steel work and hydraulic rams being built by Dominion Bridge in Montreal. An interesting point is that the concrete structure, including towers, was built without reinforcing steel! The twin lift lock was completed in 1904 having a lift of 65 feet (20 m) and caisson dimensions of 140 feet (42.6 m) x 33 feet (10 m) x 8 feet (2.4 m).. At that time it was the highest ship lift in the world and remains today the highest hydraulic lift lock although over the years higher mechanically counterbalanced lifts have been built in Europe. In 1964, the structure was renovated including conversion to oil hydraulics and electric pumps but it remains in operation today very much as it was in 1904 — a tribute to its designers and builders.

In Nova Scotia, the St. Peter's Canal was built and rebuilt to connect the Bras d'Or Lakes in Cape Breton with the Ocean — an interesting feature being double mitre gates facing in opposite directions to provide for the reversal of the head due to tides.

In the early 1900s, the St. Andrews lock was built on the Red River near Winnipeg.

The Canso lock in Nova Scotia was completed in 1955 to essentially "Seaway" size and indeed its ship arresters and sector gates were the prototypes for those built on the Seaway a few years later.

In the 1960s Quebec Hydro built a power dam at Carillon that flooded out the Ottawa river canals and replaced them with a modern lock with a maximum lift of some 65 feet (20 m).

Then, finally, B.C. Hydro built the Keenleyside lock and dam in 1968, the interesting feature of this lock being an upper gate arrangement to accommodate a reservoir range of some 76 feet (23 m).

The Seaway

After the completion of the Fourth Welland canal [1930], the St. Lawrence from Montreal to Kingston formed a 4.2 m draft bottleneck. Planned improvements in this section included power development and since the river was an international waterway from Lake St. Francis to Lake Ontario agreement between Canada and the U.S.A. was required. Planning commenced before the turn of the century and in 1924 a Joint Board of Engineers was established under the International Joint Commission. The "Joint Board" prepared a 1926 "St. Lawrence Seaway Project" report which called for the development of power and navigation by the two countries. This resulted in a 1932 Treaty which, however, was not ratified by the United States. The only major work in the 1930s was the construction of the Beauharnois power project which ultimately was to have an installed capacity of some 2 million horse power. In approving this project, the Canadian Government stipulated that provision be made in the power canal for a future deep waterway navigation channel and this indeed became the future Seaway route between Lake St. Francis and Lake St. Louis.

It was not until after the second world war that the economic and political will on both sides of the border could be mustered again to support the St. Lawrence Waterway Project. By this time, the need for hydro power in both Ontario and New York State along with interest in developing Quebec-Labrador iron ore deposits swung the balance in its favour. This resulted in agreements in 1954 that permitted the power entities to proceed in conjunction with navigation entities in both countries. Four agencies: The Power Authority of the State of New York (PASNY), The Hydro Electric Power Commission of Ontario (HEPCO), the Saint Lawrence Seaway Development Corporation (SLSDC) in the United States and the St. Lawrence Seaway Authority (SLSA) in Canada were charged with the task.

The project consisted of a series of canals and seven locks along with a power dam at Cornwall and control dams at Long Sault and Iroquois. All but the two locks on the Wiley-Dondero Canal near Messena, N.Y. were in Canada. Canadian navigation planning in the late 40s had been carried out by the Department of Transport's General Engineering Branch under Guy A. Lindsay and in the early 50s by the Special Projects Branch under R.A.C. Henry. Final design and construction was carried out by order of the St. Lawrence Seaway Authority with Carl West — member, Gordon Murphy — Chief Engineer and Lawrence Burpee — Deputy Chief Engineer being the senior engineers of the Authority.

The Canadian Seaway along with the power project and the United States section was constructed between 1954 and 1959. This was a major accomplishment in designing and building such a large project in less than five years. (The Suez and Panama Canals, respectively, took ten and twenty-four years to build. The Suez Canal is an open channel all the way, with no locks, and neither of the canals was associated with a major hydroelectric installation and several control dams.) Actually the power project was essentially complete in 1958 when the reservoir was flooded in August of that year.

In the Montreal area, the 18 mile (29 km) South Shore Canal with locks at St. Lambert and Cote Ste-Catherine overcame the 50 feet (15 m) difference between Montreal Harbour and Lake St. Louis. From that level to Lake St. Francis, the 15 mile (24 km) Beauharnois power and navigation canal with two locks provided for the 80 foot (24 m) elevation difference in that section. In the "International Section" the SLSDC constructed the Wiley-Dondero Canal with its Snell and Eisenhower locks to provide for the difference in elevation of some 82 feet (25 m) between Lake St. Francis and the upper river (essentially Lake Ontario Level). Further upstream, a guard lock was built at Iroquois.

The Seaway locks were built to the same standard as the Welland Canal with a usable length of 730 feet (222.5 m), width 80 feet (24.4m) and minimum depth on gate sills of 30 feet (9.1 m). All but Iroquois lock service gates are single skin mitre gates but sector gates are also provided at the upper end of Cote Ste-Catherine and Upper Beauharnois locks to serve as guard gates. Iroquois lock has sector gates as service gates and these are also used for lock filling and emptying as the lift at this location is minimal. The other locks all have multi port side filling systems based on a 1/30 scale hydraulic model (L.H. Burpee 1980). These were probably the first Canadian locks to benefit from model testing.

The locks and approach walls are constructed on bedrock, the sole exception being the greater part of the upper approach wall to the Iroquois Lock, which part was built on a very dense till. In respect of water infiltration, the worst section was at Beauharnois, this, because of the seamy sandstone. Apart from the odd section in the limestone and shales found further downstream, the excavations at Cote Ste-Catherine and St. Lambert were not bothered too much by water infiltrations. The Cote Ste-Catherine Lock site was, however, flooded out during construction, the flooding caused by an ice jam in the river.

[The concluding section of this paper will appear in the next Newsletter. The lengthy discussion on the Welland Canals will be presented in an abbreviated form at some later date.]

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English Cycleway

A new 11-kilometer, purpose-built canalside cycleway has opened in the heart of England's Black Country. Starting at the Black Country Museum in Dudley, 208 kilometres northwest of London, it forms part of a 23-kilometer route from Birmingham to Wolverhampton due to become complete this year. [Toronto Globe's "Globetrotter"]

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New Members

Michael E. Morthorst
6141 Ohio Avenue
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45236-3506

John Mehew
27704 Valley Run Drive
WILMINGTON, Delaware
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Peter McKenna
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The Canadian Canal Society

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