

# AMERICAN CANALS

BULLETIN OF  
THE AMERICAN CANAL SOCIETY

BULLETIN NUMBER 71

Editorial Address—809 Rathton Road, York, Pa. 17403

NOVEMBER 1989

## PRESIDENT'S MESSAGE

What's the question to, "At the height of construction in 1913, 43,000 people worked on this canal"? The TV game show "Jeopardy" had a whole category on canals recently, so we've finally entered the mainstream of American culture. The contestants didn't have much trouble with the canal questions. We could have given them some tougher ones, such as "On July 4, 1828, President John Quincy Adams went to this canal's groundbreaking, instead of to the B&O Railroad's" or, "William Adolph Baillie-Grohman complained that building this canal in British Columbia was 'a gentlemanly way to commit suicide'!"

Further proof that canals are still a vital part of our culture was obvious to everyone who attended the Second National Conference on Historic Canals, this time hosted by the Canal Museum in Easton. In fact, it was even proposed that the delight humans take in the past and in historic preservation is not a frill, but a basic human need. Trying to figure out how the world works, and learning from the past, is probably a basic survival instinct built into our brains!

The conference was a definite success, from the keynote address by Brent Glass to Lance Metz's inspiring discussion of canal history sources. It deserves to continue as an annual event where professionals and amateurs can get together for several days to discuss canal research, preservation, restoration, and park development. This is the place for your local planner to learn how serious and widespread canal preservation is in America, and to share his problems and enthusiasm with others. We're going through a good period for canal preservation now, so let's keep the ball rolling while we can.

Our joint meeting with the Canadian Canal Society on the Welland Canals was also a tremendous success thanks to the Welland Canals Foundation, St. Catharines, the St. Lawrence Seaway Authority, and the planning of Lou Cahill and our northern neighbors. We even jointly unveiled a plaque in the new museum under construction at Lock 3, so for the first time, the names of both societies have been permanently molded in bronze.

ACS member Mark Newell, who has carried out some excellent archaeological work on the Santee-Cooper Canal, is developing an ACS Canal Archaeology Committee with Fred Warner and Emory Kemp. If you would like to become involved, contact Dr. Newell at the University of South Carolina's Institute of Archaeology and Anthropology, 1321 Pendleton St., Columbia, SC 29208-0071. More later.

Happy holidays!

Bill Trout

## BEN FRANKLIN III AT METAMORA



The new canal boat on the White Water Canal at Metamora, Indiana. Note the country's only covered-bridge aqueduct in the background. Photo courtesy Linda Ethridge, President of the Marine and Industrial Fiberglass Corporation.

A new canal boat to replace the old Ben Franklin has been built, transported to Metamora and launched in the canal at the Whitewater Canal State Historic Site.

Ben Franklin III was built in Pascagoula, Mississippi by the Marine and Industrial Fiberglass Corporation. According to the Director of Engineering and Production, Clarence Martin, she is 75 feet long, eleven feet eleven inches at the maximum beam and draws 5½ inches of water. Her hull is of fiberglass cast in one piece and is unsinkable. She will accommodate 80 passengers.

The model for the boat was a typical line boat of the canal era. She will be put into service for the 1990 season and appropriate dedication activities are being planned.

*(Canal Society of Indiana Newsletter, Fall 1989).*

Charlie Derr, ACS Secretary, tells us that the following are new LIFE MEMBERS of our Society: Harry Adam of Hamburg, PA, Martha Hazen of Belmont, MA and Peter Walker of Montclair, NJ. This brings ACS Life Membership to a total of seventy-three. Our thanks to all of you for your support!

## NEW CANAL BOOK

*THE DELAWARE AND LEHIGH CANALS*, compiled by Ann Bartholomew based on research by Lance Metz, contains approximately 330 photographs of both canals selected from the extensive collection of the Canal Museum in Easton. Many are published here for the first time. In 160 pages the book takes the reader on an odyssey through time up the Delaware Canal and the Lehigh Navigation, through Bucks, Northampton, Lehigh, Carbon and Luzerne counties and past such towns as Bristol, New Hope, Easton, Bethlehem, Allentown, Catasauqua and Mauch Chunk (Jim Thorpe). Photos of New Jersey's Delaware & Raritan and Morris canals, which connected with the Delaware Canal, are included, as are views of Carbon County's famous Switchback Railroad.

Brief histories of each waterway and detailed captions impart to the reader an understanding of the canals' historical importance and of the men and women who boated on them. The book will appeal not only to anyone who is interested in canals but also to those familiar with the scenic beauty of the Lehigh and Delaware Valleys.

8½" x 11" Hardbound. Price \$28.00. Hugh Moore Historical Park and Museums, P.O. Box 877, Easton, PA 18044.



# American Canals

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**“DEDICATED TO HISTORIC CANAL  
RESEARCH, PRESERVATION  
AND PARKS”**

AMERICAN CANALS is issued quarterly by the American Canal Society, Incorporated. Objectives of the Society are to encourage the preservation, restoration, interpretation and use of the historic navigational canals of the Americas; to save threatened canals; and to provide an exchange of canal information.

Annual subscription to “AMERICAN CANALS” is automatic with a minimum ACS dues payment of \$12.00. Individual copies may be purchased at \$3.00.

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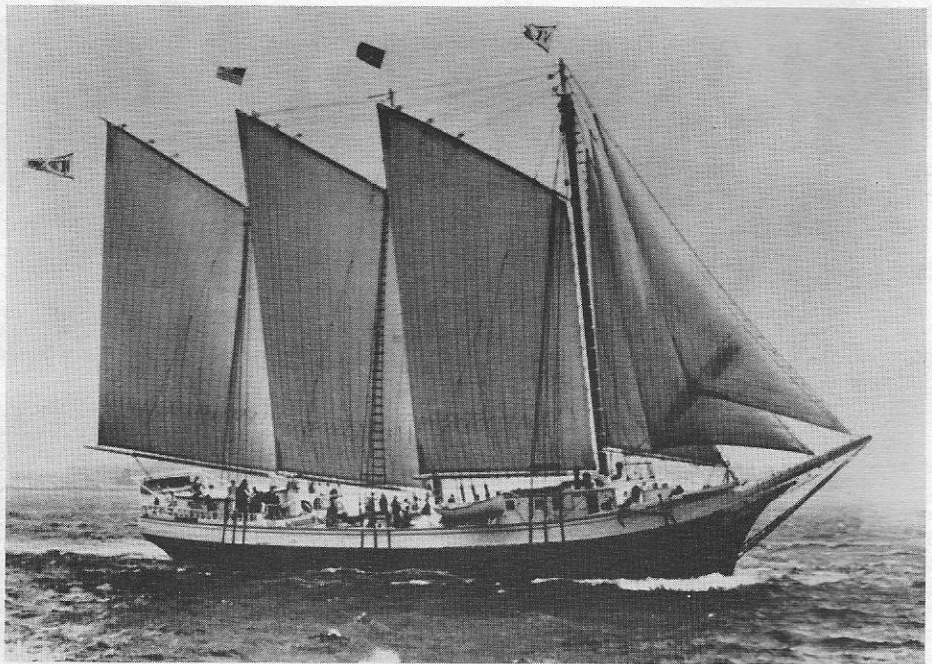
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## “VICTORY CHIMES” UPDATE



The “Victory Chimes” under full sail, the last of many Chesapeake Bay “rams”. (Photo credit: Capt. Frederick B. Guild.)

By William J. McKelvey, Jr.

The end of an era for venerable Main Coast Cruises schooner “VICTORY CHIMES” of Castine, ME came at the end of the 1985 season. Capt. Frederick B. Guild, owner and operator since 1959, retired and put the vessel up for sale. When built in Bethel, DE, in 1900 with U.S. Registry #136784, the three masted vessel was named “EDWIN & MAUD” and carried cargoes in and around Chesapeake Bay including lumber from the Carolinas to Philadelphia and New York. She is the last of many Chesapeake Bay “rams” to survive. This type of schooner was built with shallow draft, wall sides and narrow beam to permit passage thru the restrictive locks of the pre-1927 Chesapeake and Delaware Canal. Rams received their name because they usually “rammed” their way thru the canal pushing aside lighter and smaller vessels which they met.

In the fall of 1985 “VICTORY CHIMES” was sold to Duluth, MN interests and was towed to Florida for the winter of 1985-6. During her stay there she was damaged in a storm while tied up at Tampa, FL but was repaired. Subsequently in the spring of 1986 she was towed north then thru the St. Lawrence Seaway, the Welland Canal, the Sault Ste. Marie locks and the Great Lakes to Duluth, MN where financial difficulties were encountered. On 22 September, 1987, “VICTORY CHIMES” departed Duluth under tow bound for St. Michaels, MD. On this trip, in lieu of the St. Lawrence Seaway route, a short cut thru the New York State Barge Canal was taken. The three masts were unstepped and stowed on deck. The canal was entered at Oswego and Lock #9 at Rotterdam Junction was cleared on 10-19-87 at 10:25 a.m. with towing performed by the tug “NORFOLK REBEL” (Registry #4863), departing lock #2 the same evening. They departed Troy lock and went south on the Hudson River, along the NJ coast to the Chesapeake Bay Maritime Museum via the sea level Chesapeake & Delaware Canal, culminating a 33 day trip on October 24th.

Early in 1988 “VICTORY CHIMES” was sold to Tom Monaghan (owner of the Detroit Tigers and the Dominoes Pizza chain) of Drummond Island, MI and in February, 1988 she was towed north to Boothbay Harbor, ME. Upon arrival she was hauled at Samples Shipyard where 8 to 16 workmen per day were employed in restoration work for the next eight months. On October 10, 1988 the ex-“Chimes” with the new name “DOMINO EFFECT” departed Maine in tow by “TUG DOMINO” to participate in the festivities of the commissioning of the new “PRIDE OF BALTIMORE” in that city. “DOMINO EFFECT” is the largest wood hull vessel in American Commercial Registry and the largest centerboard vessel in the world.

This veteran ex-cannaler should be on the national register!

### Bibliography:

1. McKelvey, William J., Jr., *Champlain to Chesapeake, A Canal Era Pictorial Cruise*, Canal Captains' Press, 103 Dogwood Lane, Berkeley Heights, NJ 07922. See Chapter 6 - (C&D Canal), Chapter 8 - (Chesapeake Bay Rams), and pgs. 208-210 (*Victory Chimes*).
2. *Steamboat Bill* Vol. #185, Spring, 1988, pgs. 56 & 57\*
3. *Steamboat Bill* Vol. #186, Summer, 1988, pgs. 141\*
4. Great Lakes News “Telescope” Vol. 37, No. 1, p. 20.
5. Lake Log Chips newsletter Vol. 16, No. 10, p. 3; No. 11, p. 2; No. 12, p. 4; No. 15, p. 1; No. 18, p. 2)
6. American Canals, No. 24, Page One. (Feb. 1978)

\*Rev. Raymond M. Donahue, Editor: Duluth to Niagara.

Our apologies to Robert J. Demer, J.D. for the mis-spelling of his name in the August 1989 AMERICAN CANALS. He is the author of “When the Iron Horse was Foaled” in that issue.



# JOINT ACS-CCS MEETING—A SMASHING SUCCESS!

By Bruce J. Russell, Contributing Editor

The joint meeting of the Canadian and American Canal Societies held on the weekend of Sept. 29-Oct. 1 was a success of the first order. Everything that could have gone right did so, and all participants had nothing but praise for those who organized the gathering. The weather cooperated, giving us warm temperatures in the mid-60s, and the sky stayed crystal clear for 3 straight days. In short ideal conditions for hiking along old canals. All of the events went off without the slightest complication, and it was the universal sentiment of both the Americans and Canadians that this was one of the top ten activities in organized canaldom. The lion's share of the praise must go to John Burtniak and Louis Cahill, members of the Canadian Canal Society who started things in motion over 2 years ago. Both men are fully cognizant of the role canals played in the history of their nation, especially on the Niagara Peninsula. Likewise George Hume, Canadian Canal Society President and Sherman Zavitz, editor of the informative publication *CANADIAN CANALS*, made sure everything happened as it was intended to.

Friday morning we visited the Seaway Control Center. This steel and glass building contains TV monitors which show the exact location of every vessel in every lock. It also contains a giant wall sized electronic screen which schematically depicts the canal from one end to the other. The position of every ship and every lock is indicated by color lights. Traffic controllers can relay messages to the ships telling them when to move ahead, stop etc. Data pertaining to wind velocities and ship's speed is fed into computers which then figure out where the passing maneuvers should take place. (Wind on a canal such as the Welland has a major effect on the speed of ships, often slowing them down.) Also the computer banks at the control center which the groups toured contain up to date information on every ship which has ever transited the St. Lawrence Seaway System, including whether or not tolls have been pre-paid or a deposit placed with the Seaway's accounting department. Prior to any vessel using the Seaway including the Welland Canal either the full toll must be paid in advance or a deposit received.



(From Left) Bill Trout, President of ACS; George Hume, President of CCS; and Lou Cahill, ACS Director and organizer of the Joint Canadian-American Canal Meeting, in front of the Parkway Inn at St. Catharines. (Russell photo.)



The "Garden City" which carried us from Port Weller through Lock Number One on the Welland Canal, and back again to Port Weller. She began life as a tugboat and was later rebuilt as a sight-seeing boat, operating out of Port Dalhousie. (Russell photo.)

A ceremony was held at Lock #3 in which a historic plaque was unveiled detailing the history of the Welland Canal as well as the more recent history of the St. Lawrence Seaway. It will eventually be placed inside the new museum and visitor's center being built nearby. As part of the festivities the president of the Canadian Canal Society, George Hume, and the president of the American Canal Society, Bill Trout, said a few words about the historical significance of the Welland Canal, and of its benefits to both the United States and Canada. Had the Welland Canal not been built, Great Lakes commerce would have been severely stunted. Bill Trout was attired in the costume of an 18th Century boatman plying the James River as well as the James River and Kanawah Canal. He certainly looked the part with his knee length britches and tri-cornered hat. Also suitably clothed was David MacKenzie who was dressed to resemble WILLIAM HAMILTON MERRITT, the father of the Welland Canal. Representatives of the media were on hand to record the event, and everyone present agreed it was a terrific reenactment.

Later in the afternoon a wine and cheese reception was held for members of the two canal societies, and a great deal of information was exchanged. News of important discoveries of canal artifacts, accounts of canal holidays in Britain and Europe, and a host of other topics were discussed by the Americans and Canadians. Both societies are growing, and interest in inland waterways shows no signs of tapering off. Among the Americans, the Ohio and Pennsylvania canal

societies appeared to have the largest contingent, with New York and New Jersey not far behind. Furthermore there was no shortage of canal oriented pins, logos, and insignias.

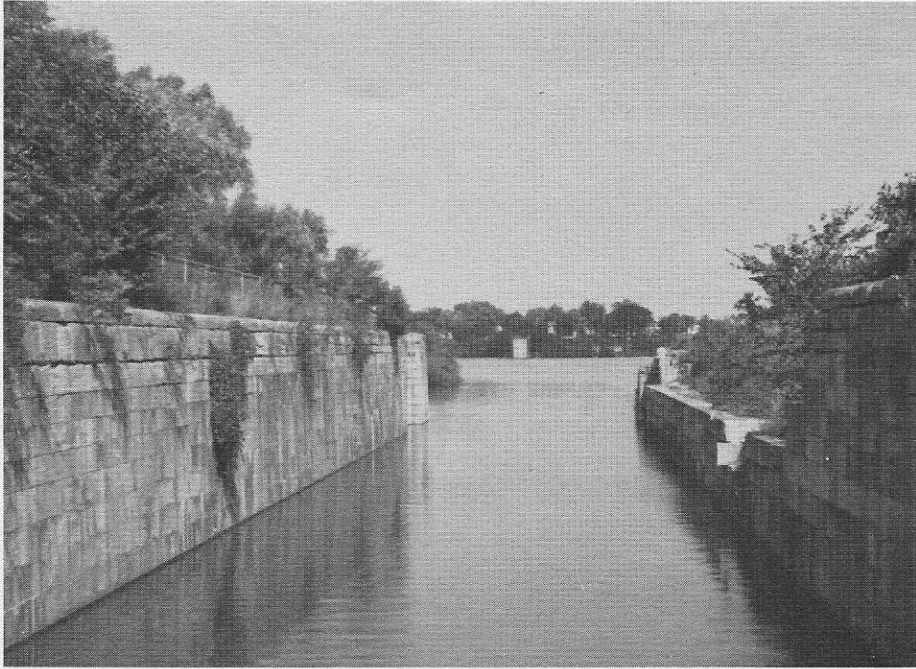
The dinner held in the banquet room of the Parkway Inn was preceded by toasts to President Bush and Queen Elizabeth. In the spirit of Anglo-American friendship Bill Trout of the American Canal Society presented George Hume, his Canadian counterpart, with a book on the batteau of the James River. Other remarks were made by John Burtniak, the Vice President of the Canadian Canal Society and Sherman Zavitz, editor of "Canadian Canals".

Following dinner Lou Cahill of the Welland Canals Foundation made a few remarks about the organization — its aims, purposes, and goals. He stressed the importance of preserving Canada's and America's canal heritage and not letting it be obliterated in the name of "progress". He likewise expressed his continuing admiration for WILLIAM HAMILTON MERRITT who in the 1820s pushed to have the first Welland Canal dug using mainly immigrant labor and borrowed capital. John Jackson, a professor of geography at Brock University and one of the guides for Sunday's bus trip, spoke briefly on the need to preserve old locks and other reminders of man's continuing success at surmounting obstacles such as the Niagara escarpment. Professor Jackson is the current president of the Welland Canals Society, one of the major driving forces behind the building of the museum and visitors center at Lock #3.

(Continued on Page Four)



# AMERICAN-CANADIAN CANAL MEETING



**An abandoned dock on the Third Welland Canal (circa 1870-1933) at Port Dalhousie. 270-feet in length it could accommodate steam-powered "lakers" of the early type. (Russell photo.)**

*(Continued from Page Three)*

The principal speaker of the evening was Mr. Harley Smith, assistant to the vice president, Western Region, St. Lawrence Seaway Authority. Mr. Smith gave the audience a brief overview of his career, concentrating on the many years he has been with the St. Lawrence Seaway Authority. He then recalled some interesting facts regarding the waterway, completed in 1959 after years of planning. He stated that it takes about 400 people to run the Welland portion of the Seaway which is actually an older canal finished in 1932 but incorporated into the newer, longer water route from the Gulf of St. Lawrence to the far western portion of Lake Superior.

Mr. Smith explained that because the Welland is much older than the rest of the Seaway it is now facing the need for extensive repairs. The concrete for its lock chambers was poured in the 1920s,



**Entrance Lock to the Second Welland Canal at Port Dalhousie. Built in 1841, it was extra large to allow larger vessels to reach St. Catharines from Lake Ontario. Balance of the Second Canal locks were smaller. (Russell photo.)**

and is starting to crack. All of this must be taken care of, and an ongoing rehabilitation program is designed to keep things in top condition through the year 2030.

Larry Turner of the Ohio Canal Society spoke very briefly, mentioning his state's canal history. He informed the audience that much preservation work was going on in the Buckeye State.

## Saturday Sept. 30

The day dawned bright and clear as almost 100 canal enthusiasts boarded two charter busses in front of the Parkway Inn for the short trip to Port Weller Harbor on Lake Ontario. Port Weller is the northern end of the present Welland Canal, and was constructed in the 1920s. It consists of two enormous breakwaters stretching over a mile into the lake, providing a sheltered approach for ships entering or exiting the waterway. Our guide for this portion of the trip was Mr. Douglas Trussel, a professional engineer with the St. Lawrence Seaway authority and also an active member of local canal societies. He explained that these breakwaters were built using the fill excavated from the six main lock chambers of the present waterway.

Upon arrival at the port we disembarked from our busses and waited for the docking of the motor vessel GARDEN CITY which would take us on a short trip through Lock #1 of the canal. What better way to experience and get the feel of a canal than to travel through one of its enormous locks? Anyhow within 5 minutes the GARDEN CITY appeared at the edge of the breakwater. She's based in Port Dalhousie located a few miles west of Port Weller. The GARDEN CITY began life as a tugboat in 1957, and for years worked the northern waters of Canada often above the Arctic Circle.

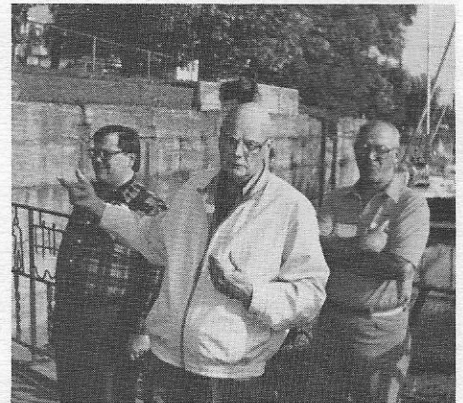
The group boarded in about 10 minutes, but we were delayed from entering Lock #1 because another Great Lakes vessel was occupying the chamber. However once things cleared up the GARDEN CITY received permission to advance.

Since we were small in comparison to the commercial vessels, we shared the lockage with a tugboat which took its position behind us. It was a marvelous sensation moving inside the cavernous concrete lock chamber and almost being able to touch its forboding walls, still dripping wet from the last filling and emptying. Most of the passengers had never had such an experience.

Once the lock gates were closed behind the GARDEN CITY the process of filling the chamber began, and slowly we began to rise. Within a few short minutes we had reached the upper level and were able to proceed into the next portion of the waterway. No matter how many times this writer experiences a lockage, the process will never cease to amaze.

It requires about 10 minutes to "dump" a lock of the Welland Canal. (i.e. to allow the water to escape from the floor and sides of the chamber.) The lockmaster is able to control all operations including the opening and closing of the gates by push button switches. Previously a man in a control booth was situated on each side of every gate. Since automation many of these concrete structures have been removed. Great Lakes vessels transiting the Welland generally do not require a pilot because their captains are familiar with the waterway and its 8 locks. Ocean going ships on the other hand do need one since their skippers are normally unfamiliar with the Great Lakes.

Upon exit from the lock the GARDEN CITY traveled about 1 mile along the canal as far as the shipyard where a Royal Canadian Navy destroyer built in the 1950s was receiving a mid-life overhaul



**Professor John Jackson (white jacket) explains some of the fine points of lock design to the visitors at Port Dalhousie. (Russell photo.)**

and retrofit. This facility was actually built for the purpose of fabricating the gigantic gates and associated machinery for the Welland Canal when it was being made in the 1920s. Once past it the GARDEN CITY reversed direction and retraced its steps back to Port Weller where we disembarked and reboarded our busses. Because the weather stayed picture perfect with a warm sun and gentle breeze it would be no exaggeration to say that our journey through one segment of the Welland Canal was an unqualified success.

Lunch was served at the social hall of a local church in Thorold, and most of the group used the time to reminisce over their varied canal activities and memories both in North America and abroad.

Following the midday meal the group returned to the Welland for an in-depth examination of some of the locks, and to get a close view of the on-going



restoration. Our stop at Locks 4, 5 and 6 was particularly illuminating. These are so-called "flight locks" which are arranged in sequence, one directly behind the other. Furthermore, these three are "twinned" meaning that ships can pass through them going in opposite directions.

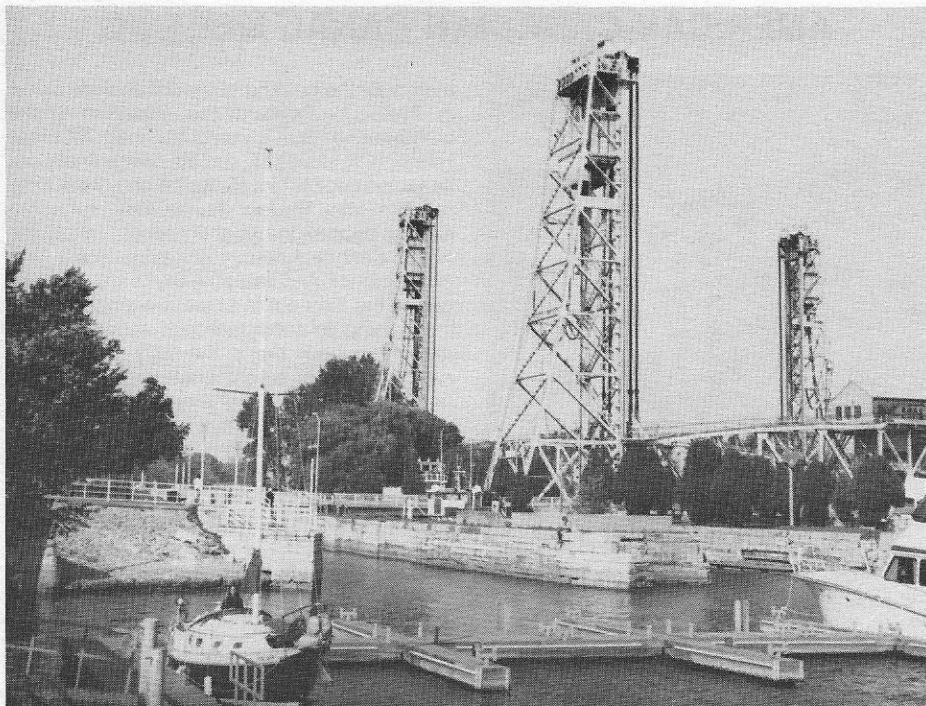
Lock #4 contains the hydro-plant which furnishes electrical current for the entire Welland Canal — power to open and close the giant lock gates, to keep the overhead lights on, etc. Although we were not permitted to enter the power plant, we could look at it from a distance. A tall cylindrical tower is located at Lock #4, and Doug Trussel explained that it was called a "surge tank" and its purpose was to hold extra water to be used to feed the turbines during certain times when there wasn't enough from normal operations.

The group then went to Lock #7 in Thorold, often referred to as the "summit lock" since it represents the highest point on the waterway. Lock #8 at Port Colbourn on Lake Erie is essentially a guard lock with no "lift" per se. In Thorold we saw the famous LOCK 7 MOTEL which overlooks the chamber. Ship watchers from all over the world come to this hostelry and rent the canal-side rooms. From their balconies they can observe both ocean going as well as Great Lakes shipping. In addition we were shown the exact spot where a 40 X 40 Ft. portion of chamber caved in during the fall of 1986 at a time of peak traffic as the summer's grain harvest was moving through the Seaway System for destinations throughout the world. This calamity was the impetus to the present rehabilitation program which hopefully will prevent repetitions.

As the October sun began to set our busses returned to the Parkway Inn and following dinner a reception and slide show was staged for the benefit of the participants. A superb picture display consisting of sharp 8 by 10 photos of the Welland Canal made this gathering most enjoyable. There were views of ships, all coal fired, passing through the 1887 vintage third canal, including some taken at the same locks we visited earlier in the day.

The slide show brought back memories of both Great Lakes shipping and life along the canal, and it's sad to think that in the USA and Canada there are no longer companies which operate large overnight luxury boats between various ports on the five major lakes and connecting rivers.

Sunday's trip was a tour of the "heritage" Welland Canals, meaning specifically the three predecessors of the current one. It was led by Professor John Jackson and John Burtniak and was



**Entrances to Welland Canals #2 and #3 side by side at Port Colborne, the Lake Erie terminus of all four Welland Canals. On the extreme right is the present Welland Canal, between the lift-bridge towers. (Russell photo.)**

one of the most comprehensive, fascinating canal tours this writer has ever been on. Both men were canal historians and industrial archeologists PAR EXCELLENCE, and were able to show us exactly where the older, now abandoned waterways went. To be able to see where four separate and distinct man made canals ran parallel to one another was an impression not easily forgotten.

We began in Port Dalhousie on Lake Ontario which is where Welland Canals number 1, 2, and 3 began. Professor Jackson, an elegant Englishman on the faculty of Brock University in St. Catharines, was our guide for the bus I was on. Upon arrival he showed us where the first waterway built by MERRITT began, and where its first wooden lock chamber was situated. As a practicing geographer he explained how land formations change over the years in response to the forces of man and nature. Little of canal #1 remains, partly because its wooden locks crumbled very quickly and canal #2 which used stone locks supplanted it. In fact much of what this tour involved was an inspection of the surviving portions of this second waterway which was the most interesting on account of its long flight of locks — known as "Neptune's Staircase" from a river valley in St. Catharines to the summit level in Thorold. At Port Dalhousie we saw the abandoned but still intact Lock #1 chamber (of the 2nd canal) which had been built in 1841 to abnormally large dimensions to enable bigger ships to reach St. Catharines. However, only smaller vessels could continue up "Neptune's Staircase" the entire distance to Thorold and on to Lake Erie.

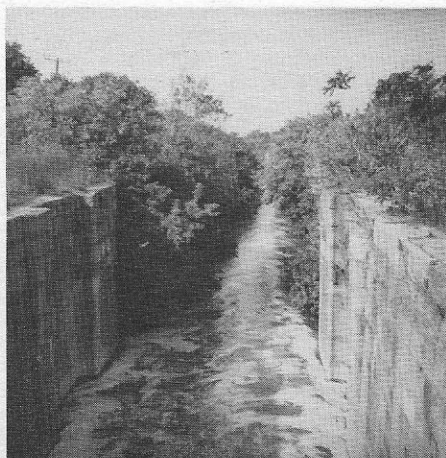
The group walked almost the entire distance of "Neptune's Staircase" consisting of locks 17, 18, 19, and 20 in rapid succession. While the wooden gates are gone the chambers themselves are remarkably well preserved and it's possible to use your imagination and visualize ships slowly climbing up the escarpment from St. Catharines to Thorold. After the canal was abandoned as a transportation waterway in 1887 upon the opening of Welland Canal #3 it remained in use as a "power canal" to bring water to a number of hydro powered mills. Even today water runs through it

for the purpose of feeding electric generating stations.

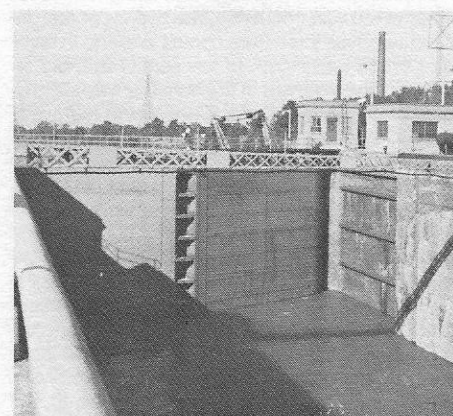
Moving into the afternoon the busses stopped in the city of Welland which contains a number of colorful and surrealistic murals painted on the sides of buildings. These generally depict life as it was in the World War I era when the third canal was still in use although its replacement was under construction.

The day's activities ended in Port Colborne, the Lake Erie entrance to the Welland Canal. Here were clearly visible the remains of the locks belonging to canal #2 of 1845 and canal #3 of 1887, side by side. A short distance away was Lock #8 of the present Welland Canal which is also an outlet or guard lock since there is no lifting per se of ships. The two old chambers were in a remarkable state of preservation and were only lacking gates. A walk around them helped visualize their "functional days" when vessels passed through in an almost constant procession.

*(Continued on Page Six)*



**Abandoned lock on the Second Welland Canal, highest on the Neptune's Staircase (summit level). Water for power still runs through the Neptune flight of locks. (Russell photo.)**



**Enormous lock gates on the present Welland Canal (Lock Number 7). This is the lock whose wall collapsed several years ago, tying up Sea Way traffic for about one month. (Russell photo.)**



## AMERICAN-CANADIAN CANAL MEETING



**Bill Trout, President of the American Canal Society, dressed in the garb of an 18th-Century Virginia river boatman, with Al Celley, Trustee for the Canal Society of the Ohio and Editor of the CSO "Towpaths".**

*(Concluded from Page Five)*

Meanwhile a large ocean going ship was getting ready to enter the present canal, bound for Lake Ontario, the St. Lawrence River, and the open Atlantic.

Upon reboarding the two busses we began the journey back to St. Catharines. On our way we drove on the side of what's known as the Welland Bypass Canal. This is an entirely new portion of waterway begun in 1967 and finished in 1973 which permitted the abandonment of about 10 miles of original channel through the heart of downtown Welland. Ship captains had long complained against that particular stretch because it contained numerous bridges, twisting curves, and tight clearances. In addition the city became immobilized whenever bridges had to be opened for ships which was frequently. The bypass or realignment removes them from central Welland in favor of a brand new "cut" to the east of that old industrial city. Involved in the scheme was the digging of tunnels to permit railways and highways to pass beneath the waterway. It was a stupendous piece of canal engineering, and if a 5th Welland Canal is ever built this 10 mile long piece will be incorporated into it. Meanwhile the old channel through Welland remains but the many bridges over it have been welded shut and their lifting mechanisms removed. It is considered a "recreational waterway" used for pleasure boating in the summer and ice-skating in the frigid winter.

The three day joint US-Canadian canal conference terminated upon our return to Parkway House in St. Catharines. Kudos must go to Mr. Lou Cahill, a semi-retired newspaperman and public relations executive who was the behind the scenes "shaker and mover" for this event which in my opinion turned out better than expected. A "can do" man with a sensitivity for his nation's past, he saw a need in the mid-1960s to com-

memorate the building of the first Welland Canal in 1829. He lobbied the Canadian postal authorities to issue a stamp honoring WILLIAM HAMILTON MERRITT, and the design finally settled upon depicts him alongside one of the early wooden locks. The tour was likewise a smashing success because the weather cooperated fully giving us clear blue skies, mild temperatures, and great visibility. And finally the key to enjoying and getting the most out of an extravaganza such as this is using your imagination to visualize what it must have been like in the days when inland navigation was an essential means of transporting people and goods. I certainly did, and became totally enraptured by the surviving remnants of the three heritage canals of which we saw only a few highlights. The 1989 Joint American-Canadian Canal Society Conference in St. Catharines will be a tough act for any other canal oriented group to follow.



**An ocean-going vessel in Lock Number Four near St. Catharines. Note the tall "surge tower" on the left, which provides water for power generation on this section of the Welland Canal. (Russell photo.)**

## The National Waterway

*By Ralph D. Gray*

First published in 1967, *The National Waterway* is a record of struggle—financial, legal, and political—interwoven with the evolution of transportation in the United States. Built in 1825-29 and operated as a lock canal until the end of World War I, the Chesapeake and Delaware Canal became a toll-free, sea-level waterway in 1927. Less than 14 miles in length, it was strategically employed to protect Washington during the Civil War when northern railway and land communications were cut off. U.S. coastal shipping later used the inland waterway during World War II to evade German submarines.

In this new edition, Ralph D. Gray brings the story up to date in the 1980s. Following extensive hydraulic, biological, and environmental impact studies by the U.S. Army Corps of Engineers, the canal has been transformed into an inland waterway with dimensions capable of accommodating all but the largest ocean-going vessels. As a result of a tragic ship-railroad bridge accident in 1973, the canal is now served by a computerized traffic-control system. The waterway supported 1.3 million tons of cargo in 1872; it now carries nearly 20 million tons each year.

The Second Edition, published in 1989, has 376 pages, 33 illustrations, 10 tables of data and a comprehensive index. Available in cloth for \$29.95 or paper for \$13.95. Write University of Illinois Press, 54 East Gregory Drive, Champaign, Illinois 61820.

## Heritage Corridor

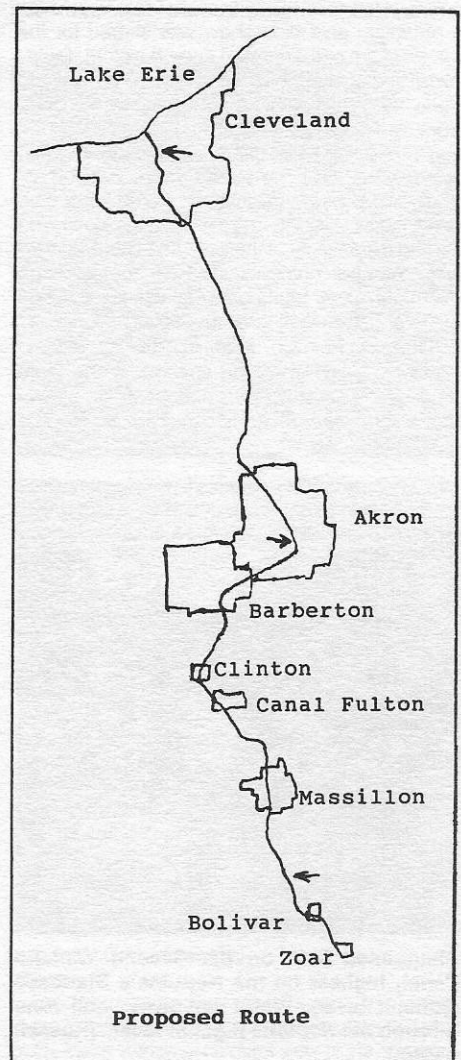
Canal Fulton Heritage Society President Ann McLaughlin recently hosted a meeting at Canal Fulton Village Hall, concerning the creation of a National Heritage Corridor along the northern section of the Ohio & Erie Canal. The corridor would stretch from Cleveland to Zoar. People from numerous organizations along the route attended the meeting.

The proposed corridor would be a boost to northeastern Ohio. If the area would receive the designation, a commission would be created to promote economic development and the preservation of historical sites. It would also help improve recreational facilities, as well as create new ones. Current foot and bike paths would be extended, new bride trails could be made.

A study is currently underway for a corridor between Cleveland and the Cuyahoga Valley National Recreation Area. The \$70,000 study should be completed in 1990. It should be beneficial in the creation of a longer corridor to Zoar in northern Tuscarawas County.

The idea for a corridor did not just spring to life yesterday. The first National Heritage Corridor was created in 1981 along the route of the Illinois & Michigan Canal. When it was first proposed 10 years ago, Ann McLaughlin suggested a similar concept for our area. Not until this year did the idea really take hold here.

*(From "The Canawler," Newsletter of the Canal Fulton Heritage Society, October, 1989.)*





# SAVING WATER AT THE LOCKS

(Editor's Note: Our President, Bill Trout, recently received a communication from overseas, as published below, concerning water use at the locks in England, where conservation is a more important factor than in the USA, due to heavy usage of the locks, particularly during the summer dry season. Bill asked a few of our board members to express their opinions. While we have no desire to start an un-ending controversy as with the various articles on "Sloping Canal Levels" of last year, we thought our readers would be interested.)

**Philip Ogden**  
(Inland Waterways Assn)

I am afraid that I, for one, do not agree with the statement made by Mr. Williamson in the November issue of "Navigation" that "when a lock is worked, the same amount of water is used whether there is a boat (any boat) in it or not."

Take the case of a boat descending. If the lock is empty, a lockful of water is used to fill the lock. As the boat enters a volume of water equal to the boat's displacement will be forced back through the gates in to the upper pound. If the lock is already full the same applies. Each descending boat uses one lockful of water less the boat's displacement. A loaded boat displaces more than an empty one, hence the reason for the rule that no boats were to run empty.

However, the above reasoning does not apply to a boat ascending. If the lock is full, it will have to be emptied, and a lockful of water will be lost. If the lock is empty the volume of water used to raise the boat will equal the volume of the lock less the displacement of the boat. However, when the boat emerges through the top gates a volume of water equal to the boat's displacement will run back into the lock. Thus every ascending boat, no matter what its draught, uses at least one full lock of water.

So there appears to be a bit of sense in this rather strange rule, but in practice it must have been pretty unworkable.

**Terry Woods**  
(ACS Engineering Design)

The President of our Society sent me an interesting article some time ago from *INLAND WATERWAYS*, a British Publication. Some comment had been made in an earlier issue that light (empty) boats were forbidden to traverse a particular English canal in going DOWNSTREAM. The article quoted agrees with that premise and stated that it 'cost' more in water for a boat to ascend through a lock than it did to descend.

This is hardly a thing to get worked up about since it doesn't really matter in canal restorations or preservations, the traffic just isn't there. But it is an interesting phenomena, and, admitting there is a risk of starting the same kind of foo-forah that was generated over why some canal engineers specified sloped canal bottoms, let's take a look at it.

In a high traffic canal (boats alternately ascending and descending through the locks) with the displacement of each boat identical, the same amount of water is lost from the upper to lower level of canal for EACH ascend/descend cycle.

With a lock's lower gates open, a boat enters and the gates are closed. The lock chamber now contains a lower-lock-full of water LESS the displacement of the boat. The wickets in the upper gates are opened, the lock is filled with water

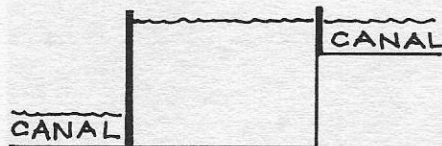


FIG. 1 FILLED LOCK



FIG. 2 EMPTY LOCK

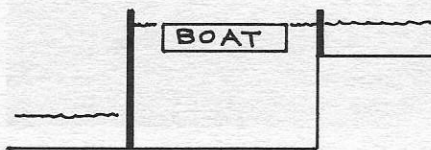


FIG. 3 READY TO LOWER

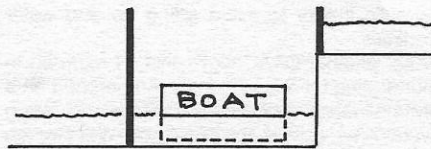


FIG. 4 IMMERSION NEEDED

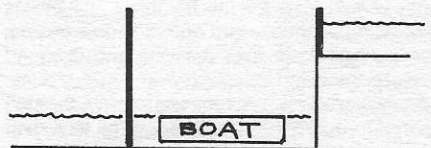


FIG. 5 BOAT LOWERED

from the upper level and the boat rises. That chamber now contains an upper-lock-full LESS the displacement of the boat. The upper gate wickets are closed, those gates opened, and the boat leaves. As it does, water from the upper level makes up for the boat displacement. That lock chamber now contains an upper-lock-full of water.

If a boat now enters that lock from the upper level, and the gates are closed behind it, that lock chamber again contains an upper-lock-full LESS the displacement of the boat. The wickets in the lower gates are opened and the water rushes out of the lock, lowering the boat. That chamber now contains a lower-lock-full of water LESS the boat displacement. One ascend/descend cycle has been completed and a volume of water equal to the difference between an upper-lock-full minus a lower-lock-full passes from the upper level to the lower level.

It's a bit more difficult to see, but a series of boats ascending through a lock will use more water than a series of boats descending (because the isolated case of a boat ascending, uses an upper-lock-full minus a lower-lock-full, while the isolated case of a descending boat uses an upper-lock-full, LESS

a boat displacement, minus a lower-lock-full. This is probably why the quoted article says more water is used ascending than descending through a lock.

A bit more practical is the case where the traffic calls for alternate up and down movement, but ascending boats are more heavily loaded than the descending boats. Then each ascend/descend cycle will cost the upper level an extra volume of water equal to the difference in displacement of the ascending and descending boats. So in a canal where the water supply was critical, a ban could have been placed on descending light craft.

Confusing, isn't it?, and in my opinion at least, once it is understood, so what!

**William Dzombak**

The volume of water required to lift a boat in a lock is the same as the volume required to lower that boat in the same lock. That volume of water is the same as the volume of water required to fill or empty that lock even if there is not a boat in the lock at the time.

The volume of water required to operate a lock is determined only by the length (L), width (W), and lift (H) of the lock and has nothing to do with the size, shape, or weight (displacement) of boats which may pass through the lock. The volume (V) of water needed to operate a lock is constant, and is equal to the maximum volume of water that can flow into the lock chamber from the upper level of the canal:

$$V = L \times W \times H$$

A boat immersed to its waterline can be treated as a rectangular block (of wood) submerged such that the top surface of the block is in the plane of the water surface in the lock. Imagine, further, that every canal lock is not filled with water, but with soil, "packed solid". To lower a boat supported in such a lock, it would be necessary to shovel out of the lock all of the earth surrounding the boat, down to the lower level of the earth (water) in the lock and in the lower level canal. Figure 5 shows where the boat would be at that stage in the lowering of the boat in the lock. To complete the lowering of the boat down to the level of the lower canal, it would be necessary to excavate a rectangular "hole", resembling a grave, so that the boat could sink into ("displace") the earth (water) in the lower level of the lock and canal, in that way to be immersed once again to the water line, before exiting the lock.

There is no need to resort to solid geometry to convince ourselves that the volume of earth that must be removed from the lock is  $V=LWH$  and is independent of the size, shape, and weight (displacement) of the boat, and of course it does not matter if the boat is being lifted or lowered in the lock. There doesn't even have to be a boat in the lock! The same volume of earth (water) has to be removed in any case.

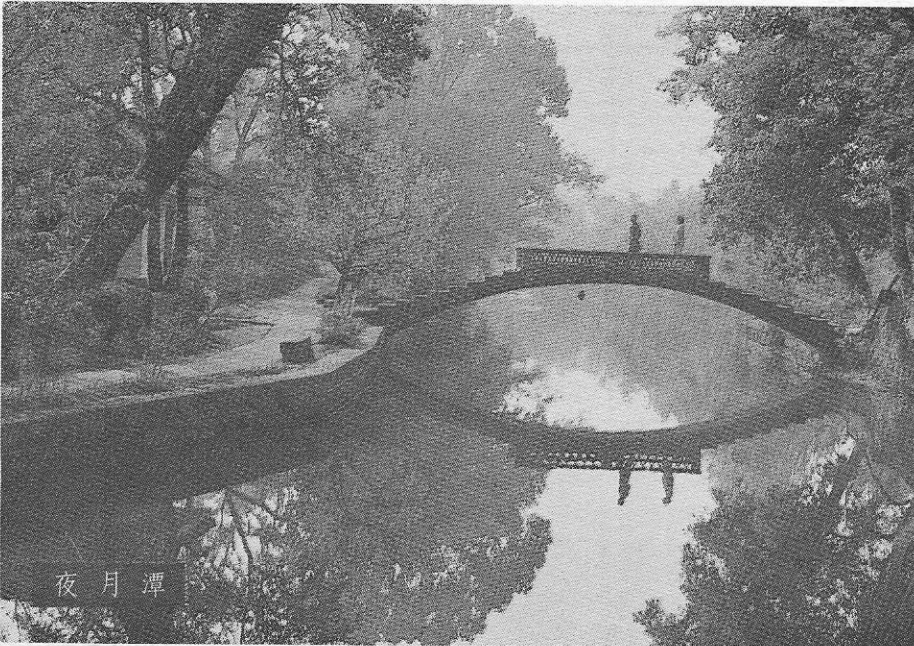
To reduce the volume of water used in raising or lowering a boat in a lock, several things can be done:

(1) Require that all boat hulls be rectangular, with vertical sides, and that the hull be almost as wide and as long as the lock chamber, to minimize the volume of "dead water" in the lock — the water around the boat, from the level of the water line down to the level of the bottom or the keel. These conditions are approximated in some

(Concluded on Page Ten)



# A VISIT TO CHINA



夜月潭

An artistic arch bridge crossing the Lingqu Canal. It is easy to see why this canal is called one of the most beautiful in China.

by Roger W. Squires

The events of the 4th June did not prevent me from visiting key Chinese Waterways during September 1989. My tour started in Hong Kong where I was able to enjoy the bustle of Hong Kong Harbour from the Star Ferry and see the sights of Kowloon.

My onward flight to Guilin, China, arrived after dark. What a culture shock. Not a street light to be seen. Just the sound of cycles cruising through the night. My first visit there was to the Li River. A spectacular navigation which winds between egg shaped hills and river cliffs. A cruise down stream provided flavour of what China has to offer to the waterways enthusiast. As did an evening boat trip to see cormorant fishing by locals, who use three thick curved bamboo poles bound together as their river craft.

The Ling Qu or Magic Canal was the next highlight of my tour. It was built in the Qin Dynasty around 219 B.C. to offer easy transit for troops and supplies between North and South China. The 30 kilometre waterway linked the Hainyang River, which flows south to the Pearl River, and the Xiangjiang River, which joins the Yangtse. It is still used for the transit of logs. The key engineering feature of its construction was a plough shaped dam at Xingan which I inspected at waterlevel from a rustic punt. A subsequent visit to the local market told me I was in a different world.

My first experience of CAAC (Locals say-Chinese Airline Always Cancels/Crashes) was a surprise. I expected to arrive in Chengdu but somehow landed at Chongqing. The excuse was bad weather. I finally arrived at Chengdu just in time to see the remarkable Old Town area before sunset. Chengdu is the centre of Panda country but I saw none. However I did see sixty types of Bamboo in the local park before going to a commune where they had a working (?) Water Mill. From there I went on to Dujiangyan where I was amazed at the size of the scheme developed in 250 B.C. to irrigate the vast Chengdu Plain. A major dam and a channel cut through a rock hill side

were the main elements of the scheme which used hydraulic theory to avoid silting up and water overflows.

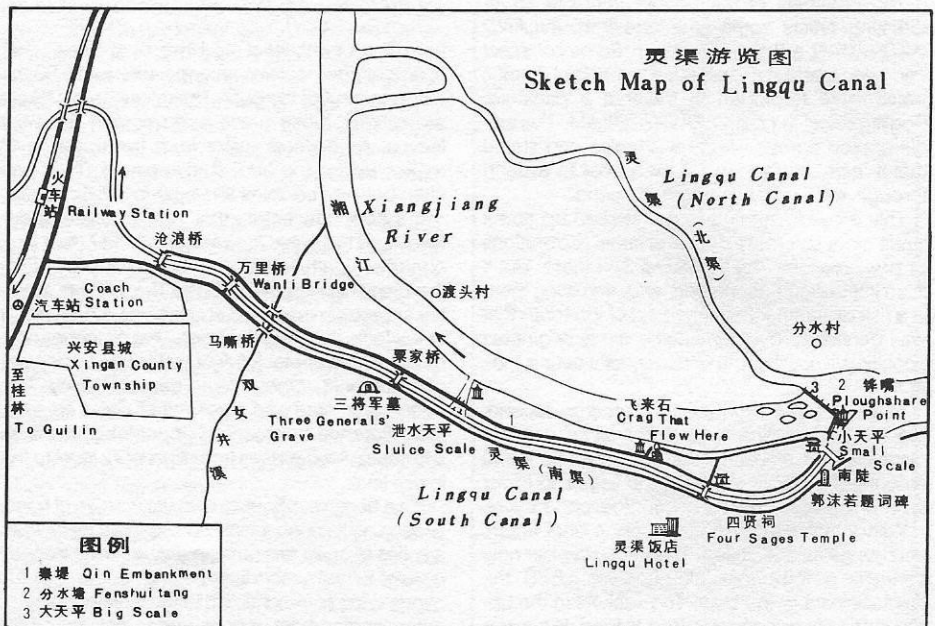
After another CAAC flight delay, I returned to Chongqing for a tour of the town perched on a hilly confluence between the Yangtse and Jialing Rivers. After visits to the two Cable Ways which span the rivers, and finding them both under repair, I crossed the modern Yangtse River bridge. Perhaps the highlight of that day was a walk along the waterfront where I witnessed the unloading of water buffalo from a small freighter. The beasts were being sold on board and their new owners then pushed them over the side and dragged them up the levee.

An early start the next morning took me through the mist to board the scheduled, three day, river boat service to Wuhan. I travelled 'tourist' class. The locals either shared cabins of six, twelve or

twenty-four, or travelled stowage sleeping on rush mats in the lower corridors. The trip through the three Gorges — Qutangxiz, Wuxia and Xilingxia, was quite remarkable. The orange coloured river seemed to boil as the boat charged past. Unfortunately the mists failed to clear completely on the two days I was in the gorges and a subsequent stoppage made us arrive at the Gezhouba dam, with its vast ship locks, after dark. Even so it was a memorable sight to pass through with six other fully laden passenger vessels. The next day was bright and I enjoyed the cruise through to Wuhan, where the river is crossed by a double deck road and rail girder bridge.

An early start took me over the bridge to Wuhan Airport for a flight to Shanghai where I visited Suzhou Creek to see the vast array of local craft. Then on by train to Suzhou. The days at Suzhou were the climax of my tour as this was the town on the busiest section of The Grand Canal. There were canal boats everywhere. Barge trains twenty-five boats long; small Sampans and working boats made from reinforced concrete. Crowded river busses carry the locals to and from the markets with all their wares. I took the standard canal trip and visited the Watergate, but longed for something more. A deal was struck and the next day I chartered a boat to tour the canals. Around the moat. Up a side arm and out into the countryside to visit the Precious Belt Bridge for a photo stop. Then back into town. I shall never forget the bustle of that living waterway. After visits to local Silk Factories to see silk production and embroidery, I had to leave Suzhou and return to Shanghai. There I had another cruise, this time through Shanghai Docks and down the Huangpu River to the mouth of the Yangtse. A clear colour difference marks where the rivers meet. It was also amazing to see the vast array of local craft of all shapes and sizes that use this waterway.

The next day I flew to Xian to visit the standard tourist sights. The Huaqing Hot Springs, the Terracotta Army, the Banpo Village and the towns Bell Tower. But my luxury hotel suite in the Peoples Hotel and a walk along the moated town Walls offered lasting memories. However these were thrown into insignificance when I saw the plane on which I was to fly to Taiyuan. I did not know there were any Ilyushin 14's left. The square windows, a 50's interior and twin petrol engines went





back to my early days of flying. I wondered if it would get into the air. It did, and after a two hour flight all arrived safe and sound. Quick visits to the Jinci Temple and the Twin Pagodas rounded off the day. The next morning I was fortunate to visit a local engineering works making water pumps and machines for making metal drums. Its small foundry would benefit any Industrial Museum, then on to the Station for the train to Datong. The route was superb, first through plains of loess, with rivers in ravines, then through mountain passes and finally past the coal mines to Datong.

At Datong I had planned to visit the Factory that built steam locomotives. Sadly production ceased in the Autumn of 1988. But I was able to see Datong Engine Repair Depot where they still rebuild steam locos. Some twenty were there in various states of repair including a couple ready to return to work. The footplate offered a vantage point normally unavailable to the tourist. Whilst I was at Datong I fitted in a visit to the Hanging Temples, where I experienced my first earth 'flush' 100, a triple squatter! I also saw the Yungang Grottoes, with their 51000 carved Buddha statues, before catching the night train to Beijing. For this journey I sampled six berth Hard Class 'sleepers' open to the corridor, but made up for it in Beijing with first class rooms in the International Hotel. The weather in Beijing was unkind. The Forbidden City was strangely gloomy in the mist but my spirits were raised with an evening Banquet of Peking Duck.

### The Great Wall

The next day also was wet as I headed out by coach to Badaling to visit the Great Wall. The locals did a great trade selling plastic macs. Just as I drove off the mist cleared and I was able to see the remarkable landmark in all its grandeur. Once back in Beijing there was a final dash to the shops, then down to the railway station to catch the Trans-Siberia Express back to England. I took the 'Russian' train through Manchuria, enroute to Moscow.

The journey started well with a new soft class twin berth sleeping car to speed me on my way. The route through Manchuria was the more scenic and green of the two options open to foreign tourists returning from Beijing. The other route passes through Mongolia which is flat and brown. That takes half a day less but misses out the remarkable journey through the mountains to Lake Baikal, the deepest freshwater lake in the world. Delays at the Russian Frontier for bogie changing took an hour longer than scheduled but the terrific views enroute to Irkutsk made the extra time worthwhile. From there to the Ural mountains (sadly misnamed as they are only hills) the line crosses the Russian Steppes. We had snow along this section of the journey and a mechanical fault meant that our arrival in Moscow was 5 hours late. This only left me time for a brief visit to Red Square to see the Kremlin and St. Basil's Cathedral and a ride on the Metro. Then I was back onboard a sleeping car, this time heading for East Berlin. I arrived the next evening at 22:50 at the East Berlin station with an onward booking from Berlin Zoo in West Berlin at 23:35. After a mad dash on the S Bahn to Friedrichstrasse, for the Border crossing on foot, I rejoined the S Bahn to Berlin Zoo. Fortunately my connection was running 80 minutes late so I made it with time to spare. Thereafter all went well and I arrived at Liverpool Street Station, in London, 2 minutes early, on Sunday 2nd October after a 20,000 mile journey halfway around the world, having achieved two of my lifetime ambitions. One, to have sailed on The Grand Canal and the other to travel on the Trans-Siberia Railway all across Russia. It was an experience that I shall never forget.



**A water-level control dam discharging surplus water from the Lingqu Canal. A pedestrian walkwalk makes the connection between two sections of the old towpath.**

## LINGQU CANAL

Situated next to Xingan County Town 66 kilometres north of Guilin City, Lingqu Canal is one of the oldest canals famous the world over in China. Under the Qin Dynasty at 219 B.C. when Qinshihuang tried to unify Southern China, he ordered Shi Lu to build the canal in purpose of supporting the frontline.

There is a folk rhyme: "Xingan is ten thousand feet high, and its river runs in different directions". It is the Lingqu Canal running in different directions. At Fenshui Pool the Haiyang River is diverted into two, one goes to the northern channel and the other, to the southern channel. The 4-kilometre long northern channel runs northward joining the Xiangjiang river at Zhouzi Islet and empties itself at the mighty Yangtze River. The southern channel winds its way about the County Town extending for 30 kilometers and joins the Lijiang River at Linghe which is a tributary of the Pearl River. These two channels form a link for the Yangtze and the Pearl Rivers, thus linking the waterways of North and South China. This canal project played an important role in history.

Lingqu Canal includes two level diversion dykes, Huazui, Qindi Bank, spillways and locks. The two level diversion dykes are in the form of an inverted V to dam the river. Huazui is a colossal block of masonry shaped like a plough-share intending to divert the river, making 30% of the waterflow to the southern channel and the rest to the northern channel, hence the saying: "30% of the waterflow belongs to the Lijiang River and 70% to the Xiangjiang River." The two level diversion dykes are able to dam the river and to drain water during floods, just like the spillways, making it possible to keep a safe water level to the County Town. Qindi Bank which was dug under the Qin Dynasty is referred to the part of the channel from Nandoukou Lock to Great Spillway. One side of the Bank is the Southern channel and the other is the original Xiangjiang River course. When floods come, Qindi

Bank is easily damaged. Legend has it that during the construction of the channel, there was a Sow Demon who would undo all the work the labourers had done and later, she was rooted on the spot by a flying boulder. The Flying Boulder is still there on the Qindi Bank. The great and small spillways built along the Qindi Bank could divert water from the channel during floods so as to protect the channel and the County Town inhabitants. The Locks along the channels were used to dam up part of the channel to raise the water level for boats coming from or going to the Lijiang and Xiangjiang rivers. There were as many as 36 locks built along the channel at various times.

Linking up the waterways in Northern and Southern China, Lingqu Canal played an important role in history, especially in spreading culture and promoting economy from Central China to Southern China. Ever since the building of railways and highways were completed, the canal has very little use in transportation, but is still useful for irrigation and tourism.

The water in Lingqu Canal is crystal clear; the Qindi Bank is surrounded by vegetations; Zhuangyuan Hill towers on the east of the canal and Diandeng Hill on the west. On the southern bank of the southern channel there is a grave of three generals. Legend has it that this grave is set up for three stone men who gave their lives for the construction of the canal. Around Flying Boulder there are seasonal blossoming flowers and fragrant grass, like a beautiful garden. A Ming Dynasty poet Yu Anqi once wrote:

The Canal winds like the Yangtze,  
with hills towering from the ground,  
And its water floats among,  
A solitary boat circles around.

Only with their own eyes can visitors believe the beauty of Lingqu Canal.



# CHINA'S GRAND CANAL

(Windy Briese of Woodbine, Georgia sent us this item. It was written by Jim Abrams, Associated Press Writer.)

HUAIAN, China (AP) — In the Tang dynasty 1,000 years ago, boatmen carried rice and supplies to fight the northern barbarians. Today, boatmen on barges still pass through Huaiian, but now they carry coal and bricks to keep China's great metropolises humming.

Life goes on, changing but always the same along the world's longest man-made waterway, the 1,000-mile Grand Canal, which Hua Yuhua, a local official, describes "as great a feat as the Great Wall."

In Huaiian, a 1,600-year-old town in coastal Jiangsu province, the canal remains the lifeline.

Huaiian is a bumpy, four-hour drive from the provincial capital of Nanjing and has no railways.

"We have looked to the water in developing our land," said the local radio station director, Wang Ruoyuan.

Every day about 1,200 barges, some in convoys of as many as 10, pass through the town's two locks, where they are lowered or raised about 10 feet.

Along the shore, a sea of men in green and blue jackets load and unload the coal, grain, vegetables, oil, roof tile, cotton, lumber and gravel that traverse the 220-mile Jiangsu stretch from the Yangtze River in the south to the city of Xuzhou in the north.

The lucky ones have donkeys, but for most a strong back and sturdy shoulders are crucial. People strapped to harnesses tug at carts and

wagons. On one bridge, a unique pulley system helps them up an incline.

Bicycles weave around bridgeside stalls that sell cabbage, oranges, soft drinks and sugar cane. Children gather around to watch an elderly couple puff oats with hand bellows that fires a blackened iron pressure vessel.

Fishermen come by with cormorants perched on bicycle handlebars, taking the black seabirds to catch fish for them.

Work on the canal began in the 6th century B.C. But the early 7th century Emperor Yangdi built the main sections, from the western capital of Luoyang eastward and the north-south channel linking Hangzhou to Beijing, China's modern-day capital.

Hundreds of thousands are believed to have been mobilized for the project.

Upon its completion, the emperor sailed its length at the head of a flotilla extending in close file for 60 miles.

During the Tang Dynasty (618-907), what served as the ministry of transport was in Huaiian, and the city had a population of 200,000, double its current number, town official Hua said.

The canal fell into disrepair after the Tang Dynasty, but the Kublai Khan rebuilt it in the 13th century.

The Communist government, after coming to power in 1949, has built an extensive irrigation and flood control system to make life easier for the people of this waterlogged, impoverished area.

The town fathers also hope Huaiian's rich historical heritage will draw tourists. It was the home to Han Xin, the Han dynasty (206 B.C.-220 A.D.) general; Wu Chengen, writer of "Journey to the West," the classic of the Ming Dynasty (1368-1644), and the late Premier Chou En-lai.

One small temple along the canal had a statue in memory of the "washerwoman," an upright woman who helped Gen. Han when he was a poor boy and later refused a reward of 1,000 taels of silver.

Near that temple, outside their one-room brick homes with upswept tile roofs, the washerwomen of today are still down at the canal, hard at work.

# Saving Water at the Locks

(Concluded from Page Seven)

modern barge canal systems. The "dead volume" thus defined stays with the boat, so to speak, and therefore does not increase or decrease the volume of water required to pass a boat through a lock, and can be thought of as water that moves with the boat as it moves through the canal, too, although in fact it does not do so.

The "dead volume" would be zero if all of the boat was above the surface of the water — that is, if the displacement were zero, so that the bottom face of the boat (block) was on the surface of the water. In that case, it is obvious that the volume of water required for locking is  $V = LWH$ . The "dead volume" is almost zero for a flat-bottomed barge that fits in a lock so snugly that only a thin "film" of water separates the sides and ends of the barge from the walls and gates of the lock.

(2) Prohibit the practice of "swelling" down-bound boats out of a lock (by opening the upper gate paddles after the lower gates have been opened). Swelling requires the addition of more water to the lock than was needed merely to lower the boat in the lock.

(3) When an up-bound boat arrives at a lock, the boat will be locked through only if the lock happens to be empty; if the lock happens to be full of water, then the up-bound boat must wait until a down-bound boat arrives at the upper gates. The down-bound boat is locked through first, then the up-bound boat enters the now-empty lock.

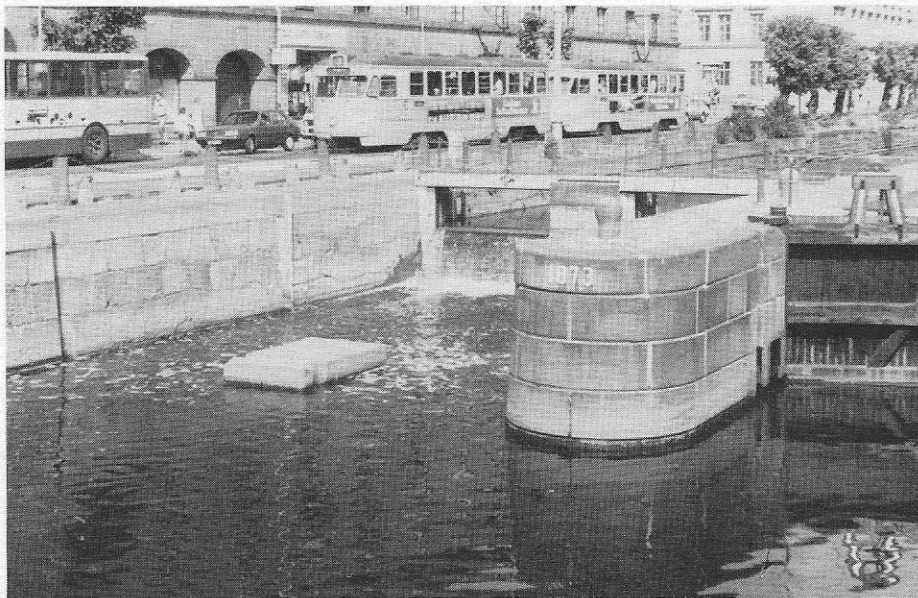
If a lock is full of water when an up-bound boat arrives, the lock must first be emptied, to allow the boat to enter the lock, then the lock must be refilled, to lift the boat to the upper level of the canal. Twice as much water is thus used than would otherwise have to be used to lock the boat through.

## Editor's Comment

In general, I have to agree with Philip Ogden. More water is "lost" with a boat of the same displacement rising in the lock than when being lowered. And certainly a light, or empty, boat would take more water to be raised or lowered in the lock than a fully-loaded one. In our historic American canals, I am sure a good locktender would try to balance up-going boats against down-going boats every time he emptied, or filled his lock, both to save work, and water. I am sure the same is true with the heavily-traveled English canals of today.

In Pennsylvania and Maryland, where much of the traffic was from the coal regions to market, the heavily-loaded boats were usually bound downstream, with the empty boats returning up-stream. Hence, more water would always be lost for up-stream boats than for downstream boats.

Frederica Kleist, Executive Director of the Portage Canal Society, reports the death of Henry Abraham, President of the Portage Canal Society, Portage, Wisconsin on October 15, 1989. Any correspondence should be addressed to Frederica at 528 West Cook Street, Portage, WI 53901.



There are not too many places in the world where you find a trolley line running alongside an old canal. Bruce Russell took this photo in Gothenberg, Sweden. As the date on the abutment tells us, this canal is part of a network built near Gothenberg in 1873. Much of it has been abandoned but this section is still used by boats to carry tourists around the city in the warm summer weather.

## CANALLER'S SONGBOOK CASSETTE TAPE

Now available, a cassette tape of all the songs in the CANALLER'S SONGBOOK. Made by the Author and his Golden Eagle String Band so you can hear the canal songs, just as they were sung one hundred years ago, while reading the music and lyrics in the SONGBOOK. To obtain the Cassette write: William Hullfish, 98 Lynnwood Drive, Brockport, New York 14420. Include a check for \$8.00, plus \$2.00 — shipping and handling.



# DISMAL SWAMP CANAL ACTIVITIES

(Picked up by Bill Gerber from a U.S. Navy newspaper dated June 29, 1989)

The Great Dismal Swamp Canal will be listed in the National Register of Historic Places and recognized as a National Historic Civil Engineering Landmark by the American Society of Civil Engineers. The newly-opened Dismal Swamp Canal Visitors Center at South Mills, N.C., was dedicated June 22 at the center.

The Visitors Center serves as a gateway to the history and hospitality of northeastern North Carolina. Joining in the festivities, a Coast Guard Auxiliary flotilla passed the Visitors Center on its way to Portsmouth, in observance of the Auxiliary's 50th anniversary.

The ceremony included remarks by state, regional and local dignitaries, and the unveiling of two plaques. One plaque indicates that the canal holds a place in the National Register of Historic Places, and the other tells visitors that the canal is a National Historic Civil Engineering Landmark. The plaques are mounted on stone moorings which once were used in locks on the canal.

The canal, completed in 1805 and the oldest surviving manmade waterway in the United States, is 22 miles long, running from Chesapeake (Deep Creek), Va. to South Mills, N.C. Its rich history includes being proposed by William Byrd (1728) and supported by George Washington, visits by Presidents James Monroe (1818) and Andrew Jackson (1829), a Civil War battle over control of the canal (1862), its purchase by the U.S. government (1929), and the establishment of the Great Dismal Swamp National Wildlife Refuge (1974). Present-day locks on the canal are at Deep Creek, Va., and South Mills, N.C.

The Visitors Center, on Route 17 at South Mills next to the Great Dismal Swamp Canal, is a \$1.7 million welcoming station serving those who travel by land or water. The facility offers parking, rest areas and a wide variety of travel and tourism information on northeastern North Carolina.

Uniquely serving both highway and canal traffic, the new Dismal Swamp Canal Visitors Center is three miles south of the North Carolina-Virginia border on Highway 17 in South Mills beside the Dismal Swamp Canal, the oldest surviving artificial waterway in the country.

The Center operates daily from 9 a.m. to 5 p.m., closed Thanksgiving and Christmas Day. Restrooms are open around the clock.

Facilities for boaters at the center include a 150-foot dock with water hook-up.

For highway and canal travelers, the center offers helpful information, including maps and details on dining, overnight accommodations, historic sites and current events. Visitors Center staff are always on hand to offer assistance in choosing the best route or arranging overnight reservations.

The Dismal Swamp Canal Visitors Center is operated by the Albemarle Commission.

(Sam Hopper sent us this Associated Press item, as published in the Fairfax, Virginia Journal, May 9, 1989:)

The U.S. Army Corps of Engineers is asking both Virginia and North Carolina to help foot the bill for the maintenance on the Dismal Swamp Canal connecting Chesapeake's Deep Creek with Elizabeth City, N.C.

"They've been saying they're going to close it ever since I started," said William Brickhouse, who has tended the South Mills Bridge on the North Carolina side of the canal for 27 years. "They say they don't have enough money."

Traffic on the canal has dropped from 2,518 vessels in 1960 to 1,072 in 1988 with the majority of boat traffic using the deeper and wider Chesapeake and Albemarle Canal to travel from Chesapeake Bay to the Albemarle Sound. Only 6 percent of the bay-to-sound traffic used the Dismal Swamp Canal in 1987, according to corps figures. Most of that traffic was pleasure boats.

Given those figures, the Corps this year asked both states to help pay the \$500,000 annual cost of operating the Dismal Swamp Canal. Now the corps is waiting for the states' reactions.

"They could both come to the meeting, say no, and go home," said Karl Kuhlmann, planner for the corps' Norfolk district, of a planned meeting with state officials within the next few months. "Then we throw it to the wolves and see where she lands."

Kuhlmann hopes North Carolina and Virginia will pay 20 percent of the cost of running the canal. "We're not talking about a lot of money. But it would put the canal in a better light for operating funds when we throw it into the federal pie," he said.

The canal was first proposed in 1728 by Virginia historian William Bryd. In 1793, slaves began construction of the 22-mile link between the bay and the sound, digging it by hand. It was finished in 1805.

The canal owes its continued existence to the neighboring Great Dismal Swamp National Wildlife Refuge. It began losing traffic to the Chesapeake

and Albemarle waterway immediately after that canal was finished in 1859. But in 1974 with the creation of the wildlife refuge, Congress required the canal remain open as an aid to preserving the swamp; operating it as a transportation link was given lesser priority.

That policy has closed the canal in recent dry years for as long as six months a year to preserve water in the swamp.

As part of budget cutting this year, the corps halted dredging on waterways carrying less than 25,000 tons of commerce annually.

"The canal doesn't have one ton of commerce a year, much less 25,000 tons," Kuhlmann said. He said that policy is still being reviewed.

Boaters who use the old canal praise its peace and beauty.

"It's a gorgeous, gorgeous trip," said Don Caster, a Californian who motored up the canal last week in a sailboat going from the Bahamas to Maine. "We came this way because of the historical value of the canal. We think it's the prettiest part of the intracoastal waterway."

Elizabeth City residents strongly support the old canal, which made that city a major transportation center until the Chesapeake and Albemarle Canal finally asserted its dominance in the early part of the century.

The city has redeveloped its waterfront, provided free boat slips for visiting boats, and even bought bicycles for visiting boaters. A 1987 survey found that the average boater passing through the city on the old canal spent \$127.

## SLOPED LEVELS, ACCORDING TO STRICKLAND

"In laying out the modern canals, it is not customary to give to the bottom a greater descent than four inches to the mile, and this only on long levels of feeders; canals of navigation are generally formed on a dead level from lock to lock."

— William Strickland, Reports on Canals, Railways, Roads, and Other Subjects, Carey and Lea, Philadelphia (1825).

(Submitted by William Dzombak)

## HISTORIC LANDMARK

COLUMBUS, Ohio (Oct. 11, 1989) . . . The Ohio Historical Society's sternwheel river towboat, the *W.P. Snyder, Jr.*, was recently designated a National Historic Landmark by Secretary of the Interior Manuel Lujan. The sternwheeler, now moored at the Society's Ohio River Museum in Marietta, is considered the last remaining steam-powered towboat of its kind in America.

Measuring 32.3 feet wide and 175 feet long, the *W.P. Snyder* was built in 1918 as the *W.H. Clingerman* for the Carnegie Steel Corporation. In 1945, the Crucible Steel Company of America bought the vessel from Carnegie and dubbed the towboat its current name in honor of the company's president.

Steamboats such as the *W.P. Snyder* came into common use after the Civil War when shippers found they could move bulk cargoes such as grain, coal, and steel inexpensively. In 1955, Crucible Steel donated the *W.P. Snyder* to the Ohio Historical Society following the rise of diesel-powered craft as the dominant means of river navigation.

## NEW STERNWHEELER FOR THE MUSKINGUM

The July 7, 1989 Cleveland *Plain Dealer* carried a story about the new *Valley Gem* sternwheel boat which is now operating on the Muskingum and Ohio Rivers.

**Capt. James Sands**, of Marietta says this boat will be one of the fastest on the river and has been running very fast during Coast Guard inspections. The 102 foot steel vessel is in service from its Front St. berth on the Muskingum, offering hourly trips at 1,2,3,4 and 5 p.m. every day, but Monday.

The 300 passenger *Valley Gem* replaces the 98 passenger *Gem* which now plies the Parkersburg, W.Va. to Blennerhassett Island run.

For more information write The *Valley Gem* Sternwheeler, 123 Strecker Hill, Marietta, O. 45750 or call (614) 373-7862.

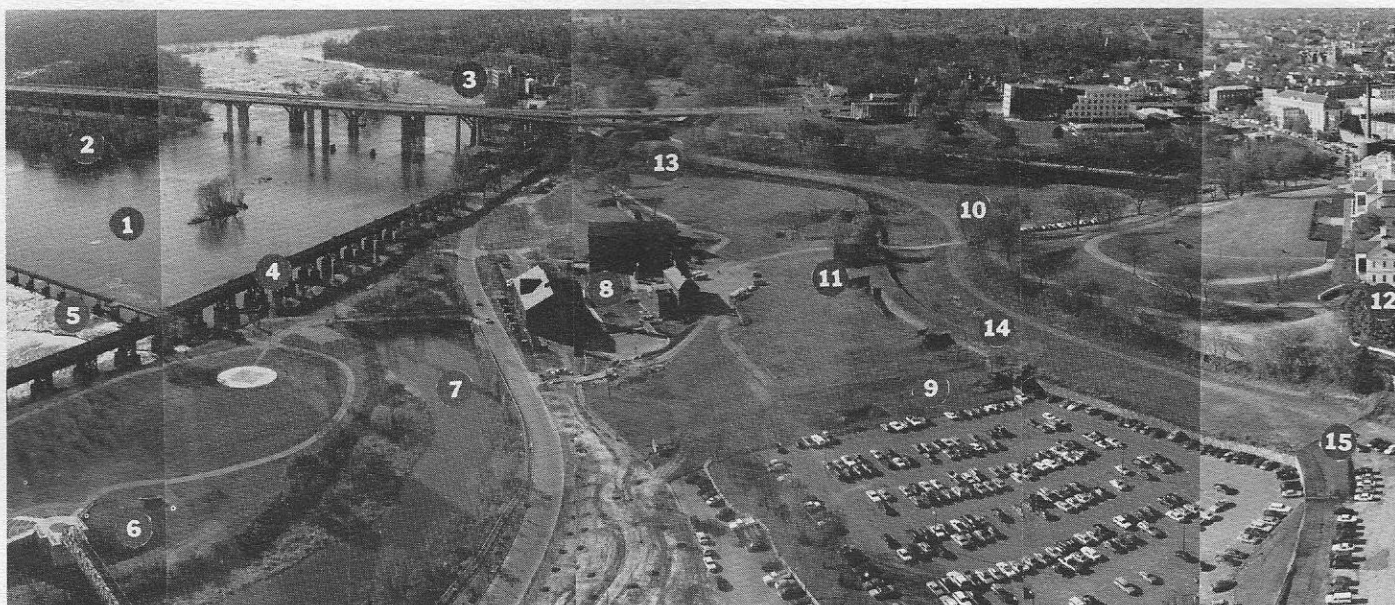
(Canal Society of Ohio Newsletter for September 1989.)

## CANAL CONFERENCE

More than 80 individuals representing canal-related historic sites and organizations in the U.S. and Canada attended the September 18-21 National Conference on Historic Canals co-sponsored by Hugh Moore Historical Park and Museums and the National Park Service. Held at the Historic Hotel Easton, the conference featured seven outstanding sessions which focused on real-life problems of canal management, restoration and interpretation. Highlights of the conference included the keynote address by Brent D. Glass, executive director of the Pennsylvania Historical and Museum Commission, a canal film night, and a day-long field trip to local canal sites.



# A LAST LOOK AT RICHMOND'S CANAL?



George Rawls took this panoramic view of a small but important part of the city's canal system, looking west from atop the Federal Reserve Building. (1) the James Scenic River, looking upstream; (2) Belle Isle (part of James River Park), crossed by the Lee Bridge (US 1); (3) James River Corporation headquarters beside the canal; (4) C&O railway viaduct (taking off from the JR&K Canal towpath in the background); (5) Brown's Island Dam, at the part breached for a fish passage; (6) Paul DiPasquale's "The Headman" batteau in Brown's Island park on Richmond's Canal Walk; (7) the Haxall Mill Race, scheduled to be made a part of the restored canal system through the city; (8) Ethyl's Tredegar Iron Works restoration, site of our celebration of the canal's bicentennial in 1985; (9) foundations of the recently excavated Virginia Armory, which ran off canal water; (10) the canal's "Upper Basin"; (11) a picturesque canalside building; (12) Ethyl Corporation's headquarters on Gamble's Hill; (13, 14, 15) the JR&K Canal sweeping around Gamble's Hill into downtown. The fate of the canal (13, 14, 15) and the Upper Basin (10) on Ethyl's property is precarious. Now that the canal is close to becoming a park, Ethyl Corporation has taken steps to "divorce ourselves from the canal and the water," as a spokesman said at a rare information meeting. Ethyl's canal may disappear anytime without notice, so better see it while you can. We all hope it will survive long enough to be appreciated as a valuable asset. (Bill Trout)

## ANY PORT IN A STORM?

By David F. Ross

*This is the first in a series by David Ross, Chairman of the ACS Navigable Canals Committee, telling of the experiences he has had in traveling the navigable rivers and canals of the U.S.A.)*

A publication of the Corps of Engineers echoes what seems to be common sense: "Head for shore if bad weather threatens." More specifically, it advises that "Dangerous waves can build up in a very short time. Stay out of open water, or if caught out head for shore, whenever winds of 25 miles an hour or more are forecast or blowing." This is exactly what we terrestrial mammals instinctively tend to do. Whatever it is that draws us to the water, we are only visitors there, and are never really secure without our feet on solid ground. However dedicated the sailor, it is not a trim ketch but a trim cottage where he longs to spend his repose, and never more earnestly than when the tempest howls through the rigging.

Nevertheless, you and I and the Corps of Engineers should know that the shore is not necessarily, or even generally, the best place to take a boat in a storm. Boats are made for water, not for land, and a boat that can bob harmlessly up and down in a heavy sea may easily be broken to pieces if the same waves find it at the shore—particularly if it is not a carefully selected shore, but merely the shore that was handiest to get to when the threat of a storm was perceived.

My own worst experience with a storm resulted from being at shore, on a gentle, sandy Ohio River beach. The radio had mentioned the probability

of occasional widely scattered thunderstorms, but the threat did not seem particularly dire. When the sky rather suddenly darkened and it appeared that the weather bureau's hypothetical thunderstorm was about to become my own actual thunderstorm, I took appropriate defensive measures against rain. The threat of wind did not alarm me. The Ohio River is not the North Atlantic, or even Lake Michigan—its only heavy seas ordinarily are produced not by wind but by passing boats; besides, I was resting on a sandy beach, without a rock in sight.

By the time I realized that this wind was producing waves large enough to cause concern, it was too late for me to leave the shore. Trying to back off with the propeller tilted for shallow-water operation only helped the waves to break over the stern. Within a moment, the waves were high enough to break over the side, and in no time at all the boat was full to the gunwales. Two facts conspired to produce this result, and both of them resulted from my being where the Corps of Engineers advises us to be in such circumstances. One fact, familiar to every surfer, is that shallow water turns swells into breakers; the other is that a boat resting on the bottom cannot ride up and down with the waves. Had I been in the middle of the river, a few things might have been jolted off shelves and I might have suffered from anxiety, but after the few minutes the squall endured, I could have been on my way with nothing worse than a memory of nature's violence. Instead, I had to call for a towing service, most of the contents of the boat were either carried off or ruined, and my engine had to spend three weeks in the repair shop being put right again.

If a storm comes up when you're out on the water, what should you do? The hard answer is that it depends, and you need to make a decision, not blindly follow your instincts or some official agency's advice. My sandy beach on the Ohio would have made a fine refuge if my boat had been a canoe, that I could pick and carry ashore. That's no excuse, though—I knew it wasn't a canoe. What I didn't know was how formidable the Ohio River can be at its angriest. Now that I do, if I'm caught there again in a storm, I'm going to do everything in my power to keep from following the advice of the Corps of Engineers and the dictates of simple human terror.

## ERIE CANAL

The original canal system paid for its self in only a few years of operation. Then for a considerable time it produced a profit for the state. But with the development of rail transportation and the competition it offered, canal traffic began to dwindle. To encourage use of state waterways a State Constitution amendment eliminated all tolls on the canals.

One recommendation now under consideration by those planning the future of the system involves the imposition of fees for passage on the canals. This would require a revision of the State Constitution.

Recreational vessels make up the bulk of present day canal traffic and this additional tax would most directly affect them. Reaction to this proposal should be monitored by the canal cruising public and decisions regarding its merits forwarded to legislators involved.

(From Canawler BARGE, May 1989)