

# AMERICAN CANALS

BULLETIN OF  
THE AMERICAN CANAL SOCIETY

BULLETIN NUMBER 35

Editorial Address - Box 310, Shepherdstown, W.Va. 25443

NOVEMBER 1980

## PRESIDENT'S MESSAGE

Since our last issue we have sadly said "Goodbye" to two old stalwarts of canal days - C. Howard Hiester of Reading, Pa. (September 26th, 1980) and Theodore A. Sherman, of Lehigh, Pa. (October 30th, 1980). We have been fortunate to have them with us so long - Howard, with his canal-boat-building yard, canal memorabilia and his many tales of meetings of the Pennsylvania Canallers Society at Port Trevorton; Ted, with interesting stories of his days as a canal boatman and the great canal ballads which he sang personally at many a canal-buff meeting.

Our members will be pleased to know that Ted was sufficiently concerned about the future of the American Canal Society to make a \$1000 bequest to ACS in his will, which I have already gratefully acknowledged to his estate attorney. A thought for all of us!

Since my last message also, our appeal for help with the Canal Index Committee has born fruit! The new Chairman of this Committee is Terry K. Woods, (6939 Eastham Circle, Canton, Ohio 44708) former President of the Canal Society of Ohio and author of many canal articles and booklets on Ohio Canals. As Assistant Chairman we are fortunate in securing the services of Bradley L. Haigh (4926 Herkimer Street, Annandale, Virginia 22003) an ardent canal buff and writer. Also, we have heard from J. Hayward Madden (5847 Decker Road, Livonia, N.Y.) a canal researcher who had offered to fill us in on New York State. We are lacking in detailed information on the historic canals of New England, Canada, New Jersey, Maryland, and Louisiana. Any of our members who wish to help in this important project are invited to contact the above Committee.

Another important project which we are about to undertake is the publishing of an ACS-sponsored book, which will probably be entitled "CANAL ENGINEERS OF THE 1800's". In this connection we have an editorial team composed of T. Gibson Hobbs, Jr., Lynchburg, Virginia; Robert S. Mayo, P.E., of Lancaster, Pa.; and Thomas F. Hahn of Shepherdstown, W. Virginia. Yours truly will act as Coordinator. Any ACS members wishing to be recognized as contributors to this project are invited to contact me.

As we enter our new fiscal year, Treasurer Charlie Derr reports that, instead of our usual very low balance just before dues time, we have a net of \$2779 on hand (without considering Ted Sherman's bequest). Our healthy situation is due to extensive sales of "BEST", as well as an overage from our Welland Canal Tour. With your help, we look forward to a busy and meaningful series of activities in the year 1981.

At this time permit me to extend my personal best wishes for a Happy Holiday Season, and a Great Year in 1981!!

Bill Shank

## C. & O. Canal Becomes ASCE "Historic Landmark"



A portion of the group which assembled for the ASCE Historic Landmark Ceremony at Great Falls Tavern, being entertained by a young musician (seated, center) playing and singing canal ballads, using an old string instrument.



Left to right; Ralph B. Sheaffer, Chairman, Nat'l. Cap. Section ASCE History and Heritage Committee; John H. Wiedeman, Nat'l. Vice President, ASCE; David M. Harlan, President, Nat'l. Capital Section ASCE; Hon. Gilbert Gude, former congressman from Maryland; Manus J. Fish, Director, Nat'l. Cap. Section, National Park Service; and Theodore M. Andriotis, Vice President, Maryland Section, American Society of Civil Engineers.

At ceremonies Saturday, September 6, 1980, attended by approximately sixty people, and held at Great Falls, Maryland, the Chesapeake and Ohio Canal was officially designated as an "Historical Civil Engineering Landmark" by two local chapters of the American Society of Civil Engineers.

The principals are shown in the accompanying photograph. A handsome, bronze plaque was presented by the National Capital and Maryland Sections of ASCE to Manus J. Fish, of the National Park Service, which maintains the canal route as a National Park. The plaque will be installed on or near the Great Falls Tavern (now a C. & O. Canal Museum) behind which the ceremonies were held. Bill Shank and Tom Hahn represented the American Canal Society.

The ASCE Civil Engineering Landmarks Program "identifies historic civil engineering works that have made a significant contribution to the development of the United States and to the profession of civil engineering, and encourages preservation of (such) landmarks". The citation, in this instance, reads as follows:

"The Chesapeake and Ohio Canal has been designated a Historical Civil Engineering Landmark by the National Capital Section and the Maryland Section of the American Society of Civil Engineers. The C. & O. Canal, which was constructed between 1828 and 1850, was an

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# 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 \$8.00. Individual copies may be purchased at \$2.00.

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SECRETARY-TREASURER - Charles W. Derr, 117 Main Street, Freemansburg, PA 18017.

## COUSTEAU SOCIETY

The following was received from the Cousteau Society, C. Richard Farley, Jr. (Norfolk)

What an incredibly good idea, your society is, and one with limitless spin-off potential for educational efforts to increase the public's awareness of man's - and specifically American society's - dependence on its waterways for travel, agriculture, commerce and the many uses man has drawn from the inland waterways through history.

Your group certainly is an excellent forum also for increasing public awareness of the ecological pressures such engineered uses - and sometimes, disregarded - have placed on those rivers and the global sea into which all of them flow.

By encouraging the preservation of historically significant and pleasing canals, your group certainly seems to be working to bring more people into appreciative contact with the water system.

Realizing that most of the world's peoples live along its seacoasts or rivers, The Cousteau Society has in recent years been exploring and documenting conditions along rivers of significance. The Nile Expedition and resultant films are an example.

The current Canadian voyage, including a transit of the St. Lawrence Seaway, is another, and our anticipated Amazon expedition is still one more effort to work our way back from the sea along the pathways the water follows in its continual recycling through our global biosystem.

While it is not readily apparent whether any actual joint activities between our organizations are likely or appropriate, exchanges of ideas and information might be mutually beneficial.

## C. & O. Canal Becomes ASCE "Historic Landmark"



Following the ASCE program at Great Falls, the entire group enjoyed watching the "Canal Clipper" locking-through the Tavern Lock to unload its passengers at a dock below. There are six locks, in excellent condition, in less than a mile of canal below the Tavern, to overcome the drop of Great Falls of the Potomac.

(Continued from Page One)

engineering marvel of its time. In its 184.5-mile (297-km) length, the canal rises 605 feet (184 m) through 74 lift locks. Masonry aqueducts were built to carry the canal across 11 major Potomac tributaries. One of these, across the Monocacy River, is 438-feet (134-m) long with seven 54-foot (16-m) arches, a significant engineering feat at that time. The Paw Paw tunnel, which is 3120-feet (950-m) long, was the greatest engineering undertaking on the canal.

"The C. & O. Canal was a training ground for many early civil engineers, among them the bridge designers Charles Ellett, Jr., and William R. Hutton. Ellett later designed the suspension bridge at Wheeling, WV, and Hutton designed the Cabin John Aqueduct; both of these structures are National Historic Civil Engineering Landmarks.

"The Chesapeake and Ohio Canal was acquired by the U.S. Government in 1938 and is administered by the National Park Service, Department of the Interior."

## CANAL CALENDAR

**December 4, 1980** - Canadian Canal Talk by Dr. Roger Squires, Melbury House, Melbury Terrace, London, and presentation by Sir Frank Price, Chairman of British Waterways Board, of their new film "Waterways - Our Heritage" to the American Canal Society, via Dr. Squires.

**December 7, 1980** - "Holiday on the Canal Dinner" sponsored by Neversink Valley Area Museum, Cuddebackville, N.Y. Tickets: by phoning Museum Office: 754-8870.

**January 16-25, 1981** - Lake Erie Marine Trades Association Mid-America Boat Show, Cleveland Convention Center. Write LEMTA, 2805 Superior Avenue, Cleveland, Ohio 44114.

**January 24-25, 1981** - Steamship Historical Society of America annual business meeting, Philadelphia. Details from Mrs. Alice Wilson, Secretary, 414 Pelton Ave., Staten Island, N. Y. 10310.

**March 15-19, 1981** - Second Inland Waterways and Ports Development Exhibition, Cologne, Germany. Write TMA-AG De-Isbergerallee 3B, CH-4018 Basel, Switzerland.

## Welland Canal Activities

In view of success of the Welland Canal 150th Anniversary Program last year, a continuing organization, the Welland Canals Heritage Foundation Inc., has been established to co-ordinate and promote the work of various organizations in the Niagara region dedicated to the economic, historical, and tourism advantages of the four canals. ACS Director for Canada, Lou Cahill of the Ontario Editorial Bureau, will serve as the consultant for public relations.

"Merritt Day," sponsored by the St. Catharines Historical Museum on 29 November, featured a bus trip up the Grand River. It was the "Grand" which made possible the First Welland Canal when it was dammed at Dunnville to provide the additional water necessary to overcome the high area of land in the Deep Cut section of the Welland Canal. William Hamilton Merritt was also involved with the Grand River Navigation which built a series of locks along the Grand River.

The trip included the Feeder Control Lock and the Royal Navy Dockyard at Port Maitland, plus a full dinner.

## Squires Plans ACS English Canals Study Tour

Our very active ACS Director in the United Kingdom, Dr. Roger Squires, reports that the October 15th American Canals film showing was a great success! Over forty people showed up for the event, to see six different films on the Mississippi Waterway, Panama Canal, St. Lawrence Seaway, Rideau Canal and Trent-Severn Waterway.

Included with this issue of American Canals, you will find a general information sheet, which Dr. Squires has sent us, for a three-part Study-Tour of the English Canals, extending from August 1 through August 16th, 1981. Parts of the program may be booked separately, or "en total". We are deeply appreciative of the time which Dr. Squires has spent on the details of this program and hope that all ACS members who are interested will communicate with him as soon as possible.

Correction to the item about the rental of the English lock cottage and/or canal narrow boat owned by the Greg Klaes family (ACS), the address is Box 4952, APO, New York, N.Y. 09194.



# THE TRENT-SEVERN WATERWAY

By Roger Squires

The Trent-Severn Waterway is a vast canal system which extends some 240 miles across the Province of Ontario from Trenton in the East, on the Bay of Quinte, which is part of Lake Ontario, to Port Severn, in the West, on Georgian Bay, which is part of the Great Lake Huron. The system comprises of 43 locks, 2 Marine Railways and some 40 miles of man made channels, which connect original rivers and lakes and by-pass waterfalls. There are 17 large lakes, with over 1000 miles of shoreline and 160 large islands, in the system and the remainder of the route consists of improved river paths and lock flights to overcome the falls, where earlier portages had to be made around the rapids.

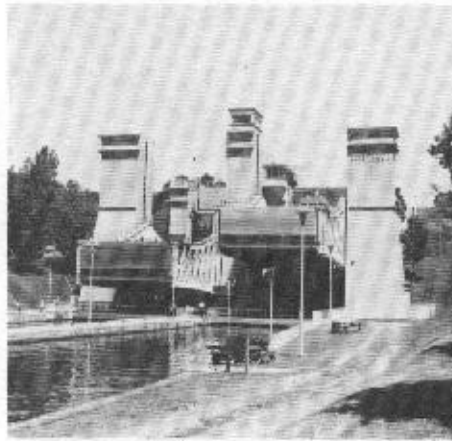
The waterway can be neatly divided into two parts. The southern Trent catchment area and the more northerly Severn river system, which rises near Lake Simcoe and empties into Georgian Bay. A man made channel unites the two river basins near Kirkfield. The summit of the canal being 814 ft. above sea level at Balsam Lake. When used as an extension of the Rideau Canal, which can be reached by a sheltered passage through the Bay of Quinte, the network offers some 425 miles of inland cruising from Ottawa through to Georgian Bay.

The origin of the Trent-Severn Waterway lies in the need for access to the sparsely populated interior of Upper Canada and facility to link the Great Lakes with protected routes entirely under Canadian control. Much of the route was originally used as an Indian trade route. It was first surveyed by the French explorer Champlain in 1615, when the French exploited the area for its furs. At this time the interior lands were Indian domain.

The future of the whole of Upper Canada changed when Wolfe captured Quebec in 1759 and opened the route to the Province of Upper Canada, part of which is now Ontario. The early immigrants found vast forests of prime timber and used the existing waterways as access to the remote areas. As the land was surveyed, the learns of lumbermen arrived to exploit the rich reserves of maple, oak and pine. They used the rivers and lakes as conveyor belts to get their logs to the Great Lakes and the sea. United Empire Loyalists founded their first settlement at Trenton, on the Bay of Quinte, in 1794 and the first sawmill was opened in the town in 1806. This established the river Trent as a prime outlet for the whole new land.

The first real plan to link Lake Ontario with Georgian Bay and Lake Huron was promoted by N. H. Baird, a civil engineer, in 1812, though earlier plans to make the Trent navigable had been suggested as early as 1785. In 1820 the British Government proposed that the Trent Canal should be built as a combined military and colonization scheme. Unfortunately it did not proceed. Even so more and more lumbermen had started to build saw mills along the water route at Frankford, Glen Ross, Peterborough, Bobcaygeon, and elsewhere. A series of new towns sprang up around these mills and also on Rice Lake, where small communities were established at Bewdley and Gore's Landing as trans-shipment ports, where goods could be loaded into scows for transit to Peterborough and beyond.

In 1826 John W. Bannister suggested a novel method of building the Trent Canal. He had the idea that the unemployed men from Britain and Ireland should be shipped to Canada so that they could work on the Canal for a year in return for the 'necessities of life' and some canal shares. Needless to say the plan did not proceed.

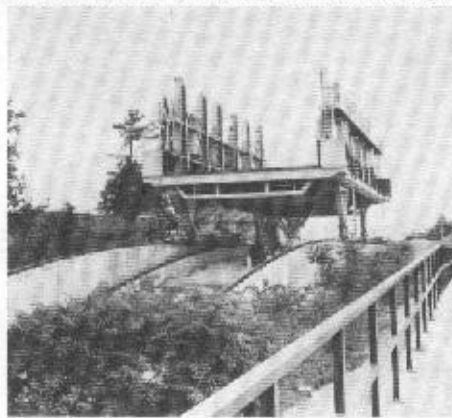


**Peterborough Lift Lock on the Trent-Severn Waterway. With a lift of 65 feet, it is the highest hydraulic lift in the world. Each chamber is 140 feet long by 33 feet wide and weighs 1700 tons when filled with water. (See also A.C. #19, Nov. 1976) Photo by R. Squires.**

By the 1830s the earlier settlers and the lumbermen had joined forces to advocate the building of a reliable water route between Lake Huron and Lake Ontario to stimulate trade. Showered with their petitions, the Government finally agreed that the Trent Canal should be developed, but on a piecemeal basis. The first lock that was constructed was a small wooden structure at Bobcaygeon that opened in 1835. Others quickly followed it at Glen Ross, Hastings, Whitlows Rapids (near Peterborough), and Lindsey over the ensuing decade. These enabled Lake Scugog to be linked with Sturgeon and Pigeon Lakes, and Rice Lake to be joined to Percy Reach. They did not, however, offer a through water route to Lake Ontario from the hinterland.

As this work proceeded in an uncoordinated and piecemeal way a full survey was conducted of the Trent River through to Rice Lake by N. H. Baird. He suggested that some 37 locks, 134 ft. long and 33 ft. wide, together with 18 dams and 5 miles of side cuts were needed to link Trenton with Bewdley, on Rice Lake. A second survey suggested that a further 37 locks, 13 dams and 14 miles of canal would be needed if Rice Lake were to be linked with Lake Simcoe. The whole scheme would cost over \$1,000,000 and take several years to build.

Political unrest and other calls for limited funds prompted the Government to decide the whole Trent Project was too costly and unnecessary in



**The Big Chute, showing the new carriage and twin, offset tracks. This photo (by R. Squires) may clear up some of the questions which resulted from our Big Chute diagram in A.C. #32, Feb. 1980.**

1841. They decided that only a few log chutes were required to enable the timber rafts to move downstream. Even so, works proceeded at Chisholm's Rapids, Percy Boom and Crooks Rapids, with the completion of further locks and dams.

The 1850s were boom years for the lumber industry. Favourable trade legislation opened up, for the first time, the huge American market for building materials to Canadian suppliers. The saw mills rapidly expanded and the population of the associated towns enlarged in leaps and bounds. However, at the same time, the railways started to expand and the growth of numerous branch lines seemed to scotch all future hope for the through water route.

The gradual influx of more and more settlers to the remoter lake shores slowly led to the piecemeal development of the waterway, but for the most part the period between 1849 and 1870 work was restricted to periodic maintenance and some upgrading of existing structures. During this time the original lock at Bobcaygeon was rebuilt, but by 1859 it was the only operational lock on the Upper Lakes. And due to the success of the railways, by 1860 the locks at Crooks Rapids and Whitlows were seldom used.

With a further growth of settlement, events changed for the better for the waterway in 1869, and between then and 1872, new locks were built at Young's Point and Rosedale. By these and other construction works, a number of unconnected sections of the waterway were made navigable and new life came back to the waterway with the growth of regular steamer routes, which supplemented the sparse railway links to the Upper Lake shores. Regular schedules were established between Lakefield, Fenelon Falls, Bobcaygeon, Lindsey and Port Perry by 1887. Between 1895 and 1907 the outstanding sections of the waterway between Peterborough and Lakefield, and Balsam Lake to Lake Simcoe, were finished with the construction of two giant hydraulic lift locks at Peterborough and Kirkfield.

The two hydraulic lift locks at Kirkfield and Peterborough were spectacular engineering projects in their own right, and visitors came to see them from all around. The one at Peterborough, with a lift of 65 feet, is still claimed to be the highest of its kind in the world. Both lift locks have dual chambers of 140 ft. in length and 33 ft. width with a normal water depth of 8 ft. The load of water and steel which comprises the lock chamber is 1,700 tons. The raising of the lock chamber is completed by the simple transfer of pressure between two hydraulic rams. The upper chamber is overbalanced with an extra foot of water and when the valves are opened between the rams the top chamber sinks pushing the locks lighter chamber up. Both locks overcame problems that had formerly presented apparently unsumountable barriers to the earlier engineers.

When the link between Rice Lake and Lake Ontario was finally completed in 1918, only the breaks in the Severn section remained to be bridged to allow through traffic between 2 Great Lakes. The completion of the through Trent-Severn route was made in 1920, with the opening of two marine railways at Swift Rapids and Big Chute. In July 1920 the first pleasure steamer, 'Irene', made the complete 240 mile journey from Trenton, on Lake Ontario, to Port Severn, on Georgian Bay, and finally established the inland route that had first been conceived in 1812. The fact that a pleasure steamer was the first craft through the waterway set the scene for the years that followed, when leisure activities grew and grew. In fact since 1920 it has been the rapid growth of pleasure craft that have ensured the waterway has continued to be maintained. Perhaps the most radical development came in

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## HAWAIIAN CANAL



Bill and Ruth Shank have just returned from a visit to our Fiftieth State and were surprised to discover the above canal just north of Waikiki Beach. It is a tide-water canal, built in 1925 to take "run-off" from the mountains and eliminate a former swamp. It is known as the Ali Wai Canal and runs nearly two miles to empty into the Ali Wai Boat Harbor, on the Ocean at Honolulu. The Manoa-Palolo Drainage Canal feeds it from the mountains, north of University of Hawaii. There is a park and small Marina on its north bank. It provides an attractive addition to the heavily populated area east of Honolulu.

## Who Said the Irish Built the Erie?

By Todd S. Weseloh

(From The Canal Packet, the Newsletter of the Canal Museum Associates, Syracuse, N.Y., Vol. III No. 2)

"Just the facts, ma'm. All I want are the facts." - So spoke Sgt. Joe Friday each week on *Dragnet*. The historian is in that same situation in trying to relate the past through the printed word. The facts of history are not easily found in many cases, as the historian has to wade through hearsay, tall tales, folklore, and myths to get to the truth. Try though he might, the historian still relates some of the myths as fact when his history is finally written.

One of the prevailing myths of New York history has been that the Irish built the Erie Canal. Everyone knew that it was a truth; they had heard it over and over again and even read it in novels and histories of the Erie Canal. The story had charm, was pleasing and made a darn good tale. One problem: it isn't true.



**Laborers on the Barge Canal (1905-1918). They were predominantly of Southern and South Eastern European origin as the low paying canal work was historically done by the newly arrived immigrants to the United States.**

The true facts came to light recently when Mr. Richard Wright, Director of the Onondaga Historical Association, gave a talk on the early settlement of Onondaga County for Onondaga History Week. He had related that the county was settled mostly by people of New England stock, and those were the people who built the original Erie Canal. He stated that he had known that the Irish had built the Erie. Hadn't he heard that time and time again? He had no more thought of questioning that "fact" than he would that Washington was our first president, until he was asked to prove it by the U.S. Immigration Service. They were doing an exhibition on Irish immigration and wanted the proof for that odd character who would come along and challenge known facts. Knowing that the Irish had dug the Erie, Wright went to find the proof.

But things were not as they seemed. He said, "I would tell you here and now that four Irish worked on the original Erie, but I haven't been able to find that fourth Irishman." After exhaustive research he had found only three Irish who worked on the original ditch.

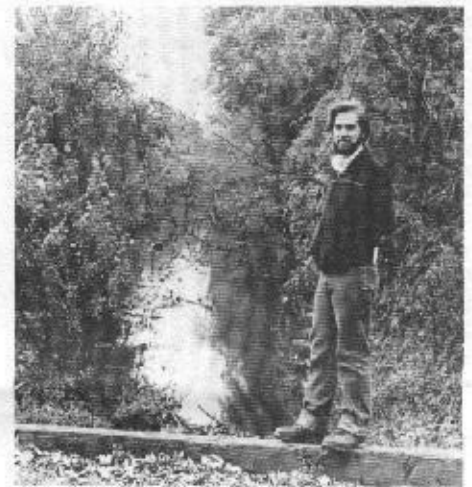
It really makes sense when looked at objectively. The Erie was built from 1817 to 1825 and the waves of Irish immigration didn't begin until the 1830's. Contracts on the original (1817-1825) Erie were let to farmers and businessmen who used local people who were primarily of New England origin.

How then did the myth get started? There is a simple explanation. The Irish Immigration began in earnest in the 1830's and turned to a flood in the 1840's. In 1836 the first enlargement of the Erie began and the contractors used the abundant cheap Irish labor. The newspapers of the enlargement period are full of stories of the brawling rugged Irish who worked along the canal. The Irish worker spurred many colorful stories and legends of work on the canal which caught the public's imagination. Many of those who worked on the enlargement could have told their children how they dug the Erie Canal, not specifying that it was the enlargement and not the original ditch. Thus the story passed from father to son that the Irish built the Erie and became an established fact in the minds of all.

## SCIOTO VALLEY CANAL SOCIETY

We call the attention of our readers to a new canal society, - the Scioto Valley Canal Society, Inc., of Portsmouth, Ohio. Their objectives are to promote interest and awareness of the public to the historic significance of the old Ohio and Erie Canal in the southern portion of Ohio. They have already published three booklets: "Memories Along the Ol' Canal" (1978); "Life Along the Towpath" (1979); and "Union Mills, Circa 1898" (1980). Current officers are: Robert A. Delabar, President; Wilma Jarrells, Vice President; Rosalie Levine, Treasurer; Beverly McCall, Recording Secretary; Charlotte Schaeffer, Corresponding Secretary; and Truman C. Throckmorton, Public Relations. For further information on the Society and its publications, write Mr. Throckmorton at 1051 Galena Pike, West Portsmouth, Ohio 45662.

## CANAL RESTORATION PLANNED



Scott McCaffrey, Director of the Steelton-Highspire (Pa.) Recreation Commission, is shown here at the north end of a watered section of the "Pennsylvania Main Line Canal" in Highspire. There is a well-preserved section of the canal running between two borough recreational parks, which McCaffrey proposes to clean up as a linear park area, with hiking and biking trails, possibly with volunteer help from the community.

## Theodore A. Sherman 1899-1980

"Ted" Sherman, an active member of both the American Canal Society and the Pennsylvania Canal Society, died at age eighty-one in the Gaden-Huetten Hospital, Lehigh-ton, Pa., October 30th, 1980.

Ted was a canal boatman, working for the Lehigh Coal and Navigation Company, 1911 to 1920. Leaving the Canal, he joined the former Central Railroad of New Jersey as brakeman, conductor and yardmaster, before retiring in 1966. Since that time, he has been giving slide-lectures on the Lehigh and Delaware Canals, often regaling his audiences with canal-day ballads.

His will includes monetary bequests to both the American Canal Society and the Pennsylvania Canal Society.

Born in the Coalport area of Mauch Chunk (now Jim Thorpe) he was the son of the late Emanuel and Sarah (Walk) Sherman. His wife, Helen (Beers) Sherman, died in 1977.



# TWICE-A-DAY ISLAND

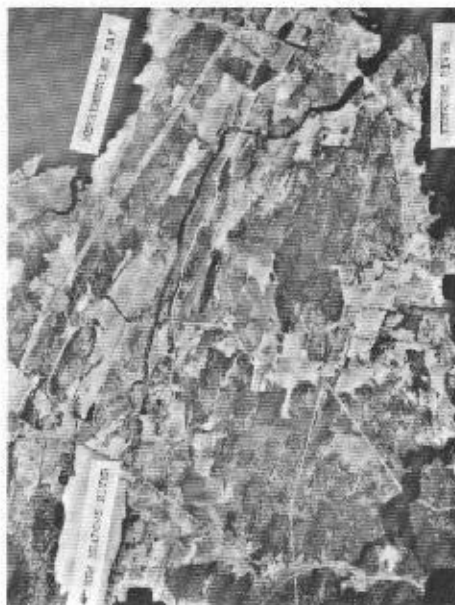
By William E. Gerber

"You who enjoy a stroll in the country these crisp winter days can find no more interesting and enjoyable tramp than that along the old canal which was built over 100 years ago to connect the *New Meadows and Kennebec Rivers*" so wrote a reporter for the *Bath Independent* in 1911, almost seventy years ago. His words give evidence that a long-forgotten feature of the landscape north of Bath had survived in a quite recognizable form at least until then. The reporter had visited the canal a few days prior and had walked its ice from end to end. Tidal flow, unconstrained by causeways had kept this waterway open from the time of its construction; then about 120 years. In addition to describing the beauty of his own crisp winter stroll and recounting a little of the history, the reporter speculated about what an asset it would be to small boats if the canal could be reopened.

Fate, aided by man, was not to be so constructive. In subsequent years, causeways were built across the Kennebec end of the canal to carry the North Bath and Lover's Retreat Roads. Likewise, a causeway was also built for the Bath-Brunswick Road. Together these structures choked off the flow that had for so long sustained the canal, leaving the adjacent waters to stagnate. Slowly the canal began to fill and disappear. Today, this waterway, once built by men of industry and vision, is little more than a wet scar on the earth. And Bath, which for more than 100 years became an island during each high tide, has once again become a peninsula.

But not all traces of the canal are gone. Inspired by the reporter of long ago, this writer also made his pilgrimage to the old canal and walked its frozen waters. There was, of course, no way to confirm that it was once three or four feet deep and it certainly no longer is. But in some places, the ice clearly exhibits the dimensions that history records; a width of 30 feet through much of its 2½ miles length, necking down to 20 feet at some points. Furthermore, Bath's peninsular status is still tenuous, at best. The entire end to end journey, except for perhaps half the length of a football field, can be made over the ice of the canal. Of course the walk is not so easy as it was 70 years ago. The northern section, between the North Bath and Lover's Retreat Roads, is still kept open by the flow of Welch's Creek (also known as Willam's Creek). But from Lover's Retreat Road west and south to the headwaters of the New Meadows River, the channel is thick with impeding scrub growth. Approaching the former crossing of the Old Brunswick Road, marsh grasses obscure most traces of the canal edges but south of this point, the route again becomes quite obvious.

What are the origins of the canal? When was it built; by whom and for what purpose? It hasn't made the news in a long, long time; in fact, the *Bath Independent's* story of 1911 may have been the most recent significant news coverage. But a little digging produced the following: the first record of the canal concept is a petition to the General Court of the Commonwealth of Massachusetts for permission to cut a canal from the head of the New Meadows River into Merrymeeting Bay. It was dated January 1, 1786, and was signed by 98 citizens of Brunswick and Bath. (What a New Year's Party that must have been!) The purpose of the canal was to bring "Lumber and Masts . . . directly into Casco Bay and to Falmouth without going to sea or running the hazard of going down that rapid torrent, the main Stream of the Kennebeck." The principle beneficiaries, of course, were to be the owners of the tidal mills along the New Meadows River. Timber local to the West Bath area was becoming scarce by this time and the canal would give the mills access to logs which even then were being floated down the Androscoggin and Kennebec Rivers into Merrymeeting Bay.



On this aerial photo, the route of the old canal, between the New Meadows and Kennebec Rivers, is clearly visible.

About four years later on March 5, 1790, the General Court passed an act authorizing the creation of a corporation to build the canal, listed the members of the corporation, and specified that no tolls would be required for public use. But on June 17th of the next year, a second act was passed amending the list of corporate members and making provisions for the collection of tolls. It read in part:

"A canal from the head of the New Meadows River to Merrymeeting Bay . . . the New Meadows Canal . . . that the said canal shall be kept open for the passing of boats, rafts and other water crafts, and for all persons who may wish to pass or transact business therein, they paying . . . the following toll; . . . every boat . . . of one ton, the sum of nine pence, and in the same proportion for vessels or boats of greater or less burthen not exceeding six shillings for any such vessel or boat. For every thousand feet of boards in rafts four pence half penny; and in the same proportion for all other kinds of lumber."

On March 22nd, 1793, the court passed an act recognizing that the canal had been opened . . . from the New Meadows River to the waters of the



Canoing in summer is still possible over much of the old canal route. (Photo by Geri Abrams)

river Kennebec, a little below Merrymeeting Bay, at a place called Welch's Creek, it having been found impracticable to open a canal directly to the Bay aforesaid, by reason of rocks and other obstructions." This act also empowered the proprietors to keep the canal open and to enjoy all rights and privileges. Based upon this act, it appears that the canal was probably completed the preceding year; i.e., in 1792.

One John Peterson, must have been the driving force behind the canal or perhaps became its principle user. He built a dam across the upper cove, apparently in the vicinity of the present Maine Central Railroad Bridge, and established a grist mill at the eastern end and saw mills at the western end. Eventually the New Meadows Canal became unofficially known as the Peterson Canal, and a road on the west side still bears his name.

The records don't tell us much about how the canal was operated. Among a number of people interviewed around the turn of the century, several insisted that the canal had never been completed and no logs had ever been transported through it. Others could recall their parents talking about going down to the locks but no conclusive evidence of locks or tidal gates has ever been found. It is not clear that anyone has ever seriously looked for them. There is a remnant of some kind of stone and mortar structure in the canal, near the north end but it is clearly not a lock and probably not a tide gate. One man, however, remembered his father telling how hard he had worked as a boy poling logs up through the canal. His father was born in 1795 and if he worked on the canal when he was only 10 years old, then the canal operated for at least 12 or 13 years. Of the various accounts, this one seems reasonably plausible. It is further substantiated by at least one other statement that under favorable conditions, two rafts of logs placed end to end, each raft composed of six large logs laid side by side, each log not less than 60 feet long, were easily floated through the canal.

Nevertheless, all evidence suggests that the canal was less than a resounding success. One problem concerned the difference in the times of high tide at each end of the canal. Typically, the canal could be used for only about three hours of each tide cycle. Other limiting factors seem to have been the insufficient depth to which the builders blasted through the ledge at the summit and the apparent lack of any flow control such as might be afforded by locks or tide gates.

Whatever problems the canal may have had, the concept of a waterway between the two rivers was a good one and would be quite useful today if it were reestablished.

(The author, William E. Gerber, resides at 16 Princess Ave., Chelmsford, Mass. 01863)

## CANAL MUSEUM OPENS

The Neversink Valley Area Museum, featuring displays and historic information on the Delaware and Hudson Canal, officially opened its doors on July 13, 1980, at ceremonies attended by over 300 people, including local congressmen, canal authors, and canal buffs generally.

The Museum has recently received a \$6000 grant from the New York State Council of the Arts, and also a \$24,000 Federal Grant from the recently formed Institute of Museum Services. Future plans include development of a D. & H. Canal Park in connection with the Museum.

A special "Holiday on the Canal" dinner is being planned for December 7, 1980 at the Cornucopia Restaurant in Huguenot. Tickets available from Neversink Valley Area Museum, Box 263, Cuddebackville, N.Y. 12729.

# CANAL HYDRAULICS - A LA FRANKLIN

John S. McNown, of the Civil Engineering Department of University of Kansas, has called our attention to one of Ben Franklin's letters quoted in "Hydraulics in the United States, 1776-1976" by Hunter Rouse. The letter was written by Franklin in 1768 to Sir John Pringle, while Franklin was living in England. Pertinent excerpts of the letter follow:

SIR, Craven-Street, May 10, 1768

You may remember that when we were travelling together in Holland, you remarked that the track-schuyt in one of the stages went slower than usual, and enquired of the boatman, what might be the reason; who answered, that it had been a dry season, and the water in the canal was low. On being asked if it was so low that the boat touch'd the muddy bottom; he said, no, not so low as that, but so low as to make it harder for the horse to draw the boat. We neither of us at first could conceive that if there was water enough for the boat to swim clear of the bottom its being deeper would make any difference; but as the man affirmed it seriously as a thing well known among them; and as the punctuality required in their stages, was likely to make such difference, if any there were, more readily observed by them than by other watermen who did not pass so regularly and constantly backwards and forwards in the same track; I began to apprehend there might be something in it, and attempted to account for it from this consideration, that the boat in proceeding along the canal, must in every boat's length of her course, move out of her way a body of water, equal in bulk to the room her bottom took up in the water; that the water so moved, must pass on each side of her and under her bottom to get behind her; that if the passage under her bottom was straitened by the shallows, more of that water must pass by her sides, and with a swifter motion, which would retard her, as moving the contrary way; or that the water becoming lower behind the boat than before, she was pressed back by the weight of its difference in height, and her motion retarded by having that weight constantly to overcome. But as it is often lost time to attempt accounting for uncertain facts, I determined to make an experiment of this when I should have convenient time and opportunity.

After our return to England as often as I happened to be on the Thames, I enquired of our watermen whether they were sensible of any difference in rowing over shallow or deep water. I found them all agreeing in the fact, that there was a very great difference, but they differed widely in expressing the quantity of difference; some supposing it was equal to a mile in six, others to a mile in three, etc. As I did not recollect to have met with any mention of this matter in our philosophical books, and conceiving that if the difference should really be great, it might be an object of consideration in the many projects now on foot for digging new navigable canals in this island, I lately put my design of making the experiment in execution, in the following manner.

I provided a trough of plained boards fourteen feet long, six inches wide and six inches deep, in the clear, filled with water within half an inch of the edge, to represent a canal. I had a loose board of nearly the same length and breadth, that being put into the water might be sunk to any depth, and fixed by little wedges where I would chuse to have it stay, in order to make different depths of water, leaving the surface at the same height with regard to the sides of the trough. I had a little boat in form of a lighter boat of burthen, six inches long, two inches and a quarter wide, and one inch and a quarter deep. When swimming, it drew one inch water. To give motion to the boat, I fixed one end of a long silk thread to its bow, just even with the water's edge, the other end passed over a well-made brass pulley, of about an inch in diameter, turning freely on a small axis; and a

shilling was the weight. Then placing the boat at one end of the trough, the weight would draw it through the water to the other.

Not having a watch that shows seconds, in order to measure the time taken up by the boat in passing from end to end, I counted as fast as I could count to ten repeatedly, keeping an account of the number of tens on my fingers. And as much as possible to correct any little inequalities in my counting, I repeated the experiment a number of times at each depth of water, that I might take the medium. And the following are the results.

## WATER DEPTH:

	1 1/2 inch	2 inches	4 1/2 inches
1st exp	100	94	79
2	104	93	78
3	104	91	77
4	106	87	79
5	100	88	79
6	99	86	80
7	100	90	79
8	100	88	81
	813	717	632
Medium 101	Medium 69	Medium 79	

I made many other experiments, but the above are those in which I was most exact; and they serve sufficiently to show that the difference is considerable. Between the deepest and shallowest it appears to be somewhat more than one fifth. So that supposing large canals and boats and depths of water to bear the same proportions, and that four men or horses would draw a boat in deep water four leagues in four hours, it would require five to draw the same boat in the same time as far in shallow water; or four would require five hours.

Whether this difference is of consequence enough to justify a greater expense in deepening canals, is a matter of calculation, which our ingenious engineers in that way will readily determine.

I am, &c. B. F.

John McNown makes the following comments concerning the above study by Franklin of canal size and ship resistance:

Benjamin Franklin's letter to Sir John Pringle shows both his inquiring mind and his perseverance. His deductions were sound and nearly complete, and his simple experiments to verify and quantify his deductions were the first recorded tests using a model of a ship. He was clearly a scientist as well as a writer and a diplomat.

His study of the increase in the drag of ships because of a lowering of the water level has been verified and extended by others. The slowing effect that he and the boatmen observed is real, and his tests gave a good idea of the effect. As the level of water in the canal dropped, so did the cross-section of the canal. In this situation a given force exerted by man or mule would yield a lower velocity. They could have reduced the ship's load and its draft had they wished to maintain the velocities. But that would have meant less income.

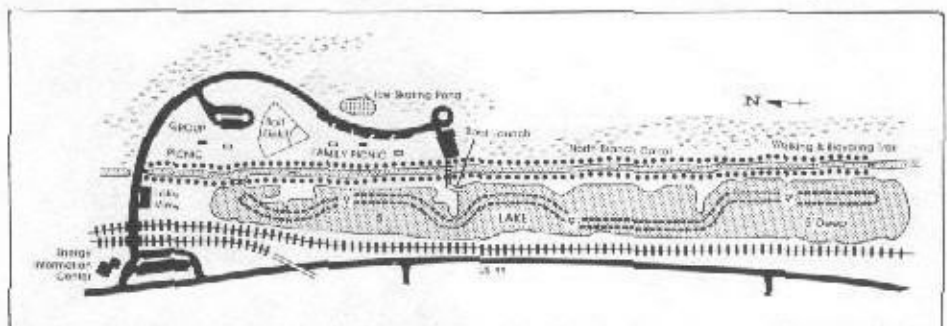
Franklin did not mention a related aspect of a ship's motion in shallow water that is known as "sinkage" or "squat." The increase in velocity of the water as it flows around the ship can only occur if the elevation of the water surface drops. Consequently the motion of a ship in a canal creates a depression in the water around the ship. The faster the ship goes, the greater the depression. Also the depression is greater in shallower water. This process is a part of the same phenomenon that increases the drag. For a ship whose submerged cross-section occupies about 20% of the channel, the sinkage can reach about 20% of the depth for the limiting speed. Large ships moving in large channels like the St. Lawrence Seaway have been observed to sink 3 or 4 ft.

The sinkage is limited and so is the speed a ship can attain in a canal. At the limiting speed, the water is just able to flow around the ship. A higher speed would mean pushing some water ahead of the ship in an ever-lengthening wave. Impracticably large propeller thrusts or towing forces would also be required. In practice ships usually do not exceed some 80-90% of their critical speeds. This prudent restriction keeps both sinkage and drag down to half of the maximum or less.

In the early days when canals were only 40 ft wide and 4 ft deep, the limiting velocities were low too. Conventional barges could go no faster than about 3 mph in one of them without undue increases in the towing forces. Even the smaller and speedier passenger ships had absolute limits of some 6-7 mph. Had they approached these speeds, their sinkages would have been 0.4-0.7 ft and their drags very high. At the actual maximum speeds, they may have settled a few tenths of a foot with horses that were strong and fresh.

In 1822 the Erie Canal authorities imposed a speed limit because fast passenger boats were operating at a "breakneck" velocity of 5 mph. The limit was set at 4 mph unless the operator had written permission from the canal commissioners to go faster. Was this perhaps a forerunner to the radar speed traps of today?

## Susquehanna North Branch Canal Park Opens



Several months ago a new canal park was opened at Berwick, Pa. It is part of a project known as "Susquehanna Riverlands" financed jointly by Pennsylvania Power and Light Company and Allegheny Electric Cooperative in connection with a Nuclear Power Plant, which is expected to be "on line" in the next several years. The plan of the Canal Park is shown above. It is located on the west bank of the Susquehanna River, near Berwick and includes nearly a mile of the old North Branch Canal channel, now fully restored and re-watered. A coordinator of the project is Lorraine Weidner, R.D. 1, Box 348-A, Berwick, Pa. 18603.



## Susquehanna & Tidewater Lockhouse



Front view of the Lockhouse in Havre de Grace, now being restored and re-furnished. (Photos by Bill Shank)

Work has begun on the restoration of the lockhouse housing the Susquehanna Museum at Havre de Grace, Maryland. The restoration will cost about \$180,000. The restoration of the lock and the holding basin will cost about \$180,000. Information is sought on the furnishing of the four rooms of the lockhouse, to make it compatible with its operating period from 1840 until 1894. Send responses to Editor, *American Canals* (Box 310, Shepherdstown, WV 25443), with copy to Charles D. Montgomery, P.E., Office of the Mayor, Havre de Grace, MD 21078.



Rear view of Lockhouse, showing part of the masonry of the Outlet Lock at Havre de Grace, also scheduled for restoration. (Made during visit of the Pennsylvania Canal Society in 1977).

## Information Needed on Turtle Creek Culvert

Information, technical aid and financial aid is needed to preserve a portion of twin-barrel culvert which carries the *Miami-Erie Canal* over the Turtle Creek Valley in Shelby County, Ohio.

This twin-arch stone culvert is approximately 166 feet long. There are concave curved stone wings at all four corners exhibiting the quality stone work of the period. Each of the two barrels has a span of 22 feet, height from flow line to spring line of the arches is 5 feet, and the rise of the arch is 13.5 feet.

Though the structure is probably unique in Ohio, information is sought as to better determine its significance within the American canal systems. Send information on any similar aqueduct to Editor, *American Canals* (Box 310 Shepherdstown, WV 25443), with copy to Stephen Dee Wort, PE, PS, 216 E. Poplar Street, Sidney, OH 45365.

## HAMPSHIRE AND HAMPDEN CANAL

By J. M. Franceschi

On February 4, 1823, the Massachusetts legislature passed the petition for incorporation of the Hampshire and Hampden Canal Company. The canal was to begin at the Connecticut River in Northampton and pass south through Easthampton, Southampton, Westfield and Southwick. It was hoped to link up with the Farmington Canal in Connecticut, providing a continuous canal route from New Haven to Northampton. One of the proprietors was Samuel Hinckley who was a strong supporter of canals and who later would support an extension of the Hampden Canal to the hinterland of Vermont. (Other initial proprietors were Ebenezer Hunt, Ferdinand H. Wright, Isaac Damon, Eliphalet Williams, Samuel Fowler, Elijah Bates, William Atwater, Enos Foote, John Mills, Heman Laffin.)

The construction of the above authorized canal had scarcely begun when the H. & H. Canal Company petitioned and was granted by the Massachusetts legislature permission to construct a canal from Northampton to the north line of the Commonwealth at Northfield in Franklin County. The act of incorporation stipulated that the water supply must come from feeders and reservoirs and not the Connecticut River. This was largely a result of the remonstrances of the rival Connecticut River Lock and Canal Company which favored river improvements and complained that diversion of waters of the Connecticut River would impair navigation in the southern part of the state. The legislature established tolls and dimensions: the canal was to be 34' wide at the surface, 20' wide at the bottom and 4' deep. The legislature also required that the canal be a public way. This section from Northampton to the north border was never constructed. The history of the south section to Northampton necessitates a diversion and brief discussion of the Farmington Canal in Connecticut.

The Farmington Canal was chartered by the Connecticut legislature in 1822 to construct a canal from New Haven to the Massachusetts-Connecticut border. Work commenced in 1825 and was completed in 1830. James Hillhouse was superintendent and Davis Hurd and Henry Farnum were the engineers. In 1826, at a meeting of the stockholders, it was voted unanimously to unite the stock of the Hampshire and Hampden Canal Company, to the extent and for the purpose of constituting the net amount of tolls and proceeds of both a general fund for dividends, as soon as both canals shall be completed. By 1830, the canal was open for traffic as far as Westfield, that portion of the Hampden canal having been completed. The remainder of the Hampden Canal was completed by 1835.

The Farmington Canal did adequate business but its income could not meet the extraordinary expenses caused by freshets which severely injured the canal and its feeders. In 1836, an especially disastrous year, a new company was formed. It was a merger of the Farmington Company and the Hampden Company and was called the New Haven and Northampton Company. The stock of the Farmington Canal was relinquished at which time the canal faced a loss of \$769,931. Since the Hampshire and Hampden was also in financial difficulties, the merger was acceptable. This involved the loss of all the stock in the company which amounted to about \$269,000. The debts of the company

The Summer 1980 issue of "The Tiller", official publication of the Virginia Canals and Navigation Society, includes an excellent series of articles by ACS Vice President Bill Trout on 24 different historic canals in Virginia. For information about the VC&N Society, write Mrs. Vivienne Mitchell, Secretary/Treasurer VCNS, 625 Pomander Walk, Alexandria, VA 22314.



Route of the H. & H. thru' Massachusetts

were paid by the creditors subscribing them at their par value to the stock of the New Haven and Northampton Company. The loss of the company was therefore \$269,110.61 (\$110.61 was not subscribed) which added to the loss sustained by the Farmington Canal Company of \$769,931.01 makes a total of \$1,039,041.62. The new company, New Haven and Northampton, was formed in 1836 with authority to issue 12,000 shares of stock @ \$25 a share. After satisfying its debts, the company was left with a cash capital of \$120,184.92.

Between the years 1836-1840, the canal "was doing a very good business" but had spent its capital and was involved in debt. By 1840, the New Haven and Northampton suffered a loss of \$238,114.92 which raises the total loss of both companies to \$1,377,156.54. Between 1840 and 1847, the canal continued to do a healthy business. However, its extraordinary losses incurred as a result of spring freshets and leaks kept the company in increasing debt. Capital became scarcer. By 1848, the canal was supplanted by the railroads.

Reasons for failure of canals or why we did not make any money:

"The canals of New England were never able to control the lines of travel or to carry passengers to any great extent. The canal companies were not transportation companies, but derived their income entirely from tolls. They therefore required several times the amount of freight which railroads do in order to make the same profit. Scarcity of capital also was a problem which resulted in the slow construction process. The apprehension that the canals would sooner or later be given up also retarded competition."

(Prepared in 1972 by J. M. Franceschi for the Massachusetts Historical Commission as background material for a potential National Register nomination).

## Where Are These Locks?



In this case the editor knows, but what is not known is the history of the short canal of which they are a part. Comments are invited. By the way of a hint, these locks can be seen from the southbound lanes of I-91. The location will be given in the next issue of *American Canals*. If you have a photo of an historical canal scene about which you would like to learn more, send it to the editor for inclusion in a future issue of *American Canals*. (Box 310, Shepherdstown, WV 25443) Photo courtesy of David G. Barber, ACS.

By the way, the WHAT IS IT? photo in the May 1980 issue of *American Canals* was provided by Jerry Sutphin, ACS, the steamboating and waterways expert in Huntington, WV.

### Canal Tours

Among popular new cruises are voyages through the Panama Canal. They team up Mexican and Caribbean ports with fascinating daylong transits through the "Big Ditch." The voyages are offered by a variety of cruise lines: Royal Viking, Princess, Sitmar, Royal Cruise, Holland America, Carnival, and Sun Line. Most of these fall-into-spring sailings run ten to 17 days.

(From Bill McKelvey, from *Better Homes and Gardens* for Feb. 1979)

We have just received an interesting full-color brochure from Continental Waterways of London with complete itineraries for "Hotel Barge Cruising in France" in 1981, using "L'Escargot", "Litote", "Palinurus", "Virginia Anne" the "Mark Twain" and "Duchesse Anne" on the Canal du Midi and canals in the Champlain Region of France. Similar tours in England are included. The brochure and information may be obtained in the USA by contacting Julia Collins, Continental Waterways, Ltd., 11 Beacon Street (Suite 1110) Boston, Mass. 02108; Phone (617) 227-3220.

### Trent - Severn

(Continued from Page Three)

1965 when the old Marine Railway at Swift Rapids was replaced by a single deep (47 ft.) fully automated mitre gate lock. Since that time various other double locks, such as the one at Fenelon Falls, have been converted to single deep locks and many locks have been fully automated.

In 1920 the Trent-Severn Waterway was seen as part of the Canadian transport system. Its control was thus initially placed with the Department of Transport. However, in 1972 its administration was transferred to Parks Canada as a formal recognition of its change from a commercial artery to a recreational and heritage resource. A formal commitment to safeguard the future of the Waterway was made in 1975 when Parks Canada and Ontario Resources Department jointly agreed to accept the recommendations of the CORTS (Canada-Ontario-Rideau-Trent-Severn) Report that contained recommendations for "preserving the corridors unique qualities" and finding a "means for the optimal development and use of the waterway," while striving for a pollution free environment. In specific terms the Report called for the restoration of historic sites, development of scenic trails, municipal parks and marinas and boating facilities as well as preserving the wild life and natural areas. These features have since been

constructively developed and the whole 425 miles of waterway that is composed of the two 'Heritage Canals,' the Rideau and the Trent-Severn; now has its future assured.

One of the tangible results of the CORTS programme has been the expansion of the recreational use of the Severn section of the route, which had been seriously restricted by the capacity of the Marine Railway at Big Chute. In 1978 work started on a second larger, parallel Marine Railway, capable of moving more larger craft. The new 'car,' which became fully operational in 1979, being capable of carrying craft of 100 tons weight up to 100 ft. long 33 ft. beam. The carriage itself is a masterpiece of engineering. It is some 80 ft. long and 35 ft. high and boats are supported on it in slings which can be adjusted by means of hydraulic rams to fit the variety of hull configurations. The whole carriage runs on two independently contoured pairs of tracks, one for the front wheels and one for the rear, which by an offset arrangement enable the cradle to retain the vessels almost level as they are transferred down the 58 ft. difference between the 2 water levels at this point. It was first planned to replace the earlier Marine Railway with a new deep lock but the decision to go ahead with the new Railway was taken to preserve the land barrier and thus prevent the migration of sea lamprey into the fine fishing waters of Lake Simcoe. The old Marine Railway, with its 26 ft. car built by Douglas Fur in 1917, still remains as a backup for the new and is still often seen in operation over the summer weekends.

The waterway today is now the domain of the leisure enthusiasts. All locks are manned by lock masters and are open between May and October each year. It is maintained in prime condition, for which pleasure craft pay a toll to use the waterways. For a 25 ft. craft amounts to only \$25 per year, whilst larger craft pay slightly more. The waterway is mainly used by the normal pleasure cruisers, but because of the long distances between locks, they all have powerful engines and some are capable of well exceeding 25 mph whilst traversing the unrestricted lake sections. For the hire boater the normal craft is a motorized house boat, which looks like a caravan on pontoons. Even so, it serves its purpose very well. Others simply use an outboard on a dinghy or a canoe. Even so, it is unusual to find a comprehensive canal system that is so unique. As such the Trent-Severn perhaps offers the canals enthusiast all he seeks.

(Dr. Squires is ACS Director for the United Kingdom.)

### MORE MINDERMAN CANAL ART



These Georgetown (District of Columbia) tow-path houses are probably the most painted, sketched and photographed buildings on the Chesapeake and Ohio Canal. The house on the extreme left was once used by the canal company and was built between 1810 and 1812. The building on the extreme right was built in 1810 by the Potomac Masonic Lodge which occupied it until 1840. The other houses were built between 1840 and 1870. (The painting was done by Earl Minderman, ACS, a landscape artist, 5010 Jamestown Road, Bethesda, MD 20016.)



The Kara-Kum Canal, designed to divert the water of the Darya River in the Soviet Union, north of its border with Iran has been completed the 600 miles to Ashkhabad. The eventual length of the canal will be about 900 miles. Construction began 25 years ago and probably will not be finished until at least 1990. (The Christian Science Monitor.)