

# AMERICAN CANALS

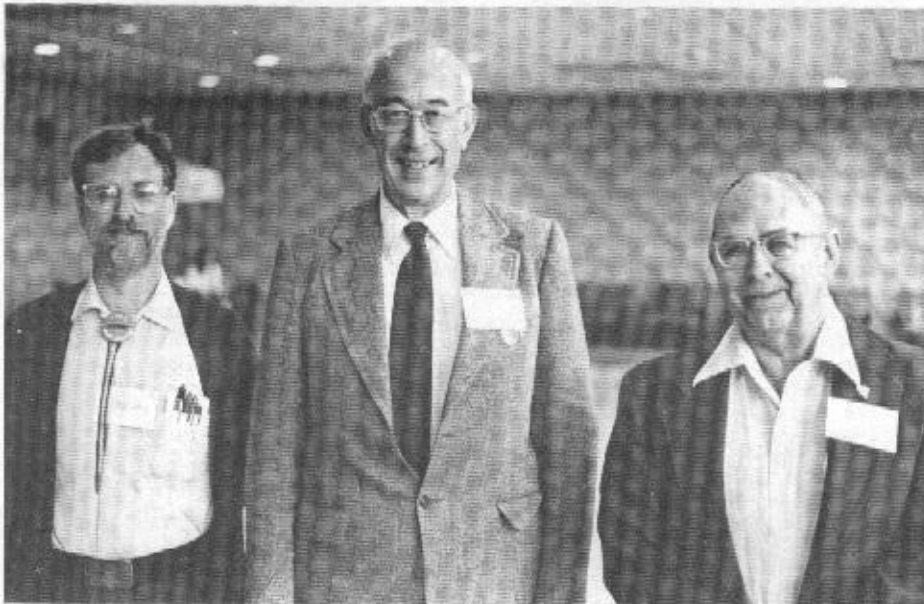
BULLETIN OF  
THE AMERICAN CANAL SOCIETY

BULLETIN NUMBER 41

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

MAY 1982

## ACS DIRECTORS SHARE IDEAS



ACS Directors get together at the Society of Industrial Archeology meeting in Harrisburg, May 8th, 1982. Left to right: Bill Trout, Art Swaeton and Bill Shank. (Photo by Bob Vogel, President of SIA.)

## Directors' Comments

"Vic" Verity, Cincinnati, Ohio — "As to the course ACS should pursue I think you have been doing very well. There has certainly been an increase in interest in canals. I have thought a time or two that more space has been devoted to foreign canals than would please the preponderance of the membership."

Bill McKelvey, Berkeley Heights, New Jersey — "I would like to express my sincere feelings for the tremendous amount of work, dedication, energy, blood, sweat and tears that Tom, Bill, Charlie and yourself have done for ACS. Without you guys there would be no ACS! I have thought many times that we must cultivate and develop capable, able and willing workers to assure that ACS will continue. I pledge my continuing support. One other item — I do believe that the ACS Board should support the Center for Canal History and Technology at Hugh Moore Park, Easton, PA."

Thomas Meek, Fort Wayne, Indiana — "Continue publishing AMERICAN CANALS. It is really good, and sets a standard of excellence which we can all follow. ACS should develop an aggressive policy for the entering of canal sites on the National Register of Historic Places, via the State Registers (which most States have.)

Encourage donations of (canal) books and publications to local schools and public libraries, by individual members. Encourage and foster local and state organizations such as the CANAL SOCIETY OF INDIANA. CSI is, in effect, the child of ACS and the Canal Society of Ohio. Thanks, Mom!"

John Lamb, Lockport, Illinois — "My suggestion is that ACS should sponsor an annual symposium or conference of papers on canal history. I gather that this already is being done in conjunction with the Canal Museum at Easton."

Lou Cahill, St. Catharines, Canada — "I wish to acknowledge receipt of the February Anniversary Issue of AMERICAN CANALS. Quite apart from your very generous recognition of myself, you are to be congratulated on this in-depth issue, which is certainly an excellent report and round-up on international canal affairs."

Roger Squires, Beckenham, England — "Could the ACS organize a listing of the Main Books of North American Waterways, to be available to students, etc., who might wish to complete projects on American waterway themes?"

"Should the ACS try to develop a greater co-ordinary role between the various Canal Societies, eg. by producing a summary review of the main items of progress they have achieved during the year?"

## President's Report

For the second time in the history of the American Canal Society, we attempted to have a meeting of the Board of Directors, scheduled during the national meeting of the Society for Industrial Archeology in Harrisburg, PA, May 8th, 1982. While only three of us were able to attend (as shown in the photo) we had a fruitful discussion, and received a number of interesting written comments from other ACS Directors, as published elsewhere in this issue.

In general, it was felt that ACS is doing a reasonably good job in meeting the objectives it set for itself ten years ago, but a little more formality in the handling of its business might be in order. The Directors feel, now that we are no longer operating "on a shoestring," that an Annual Treasurer's Report should be made available to members who wish it; and we should also call a Director's Meeting annually, getting all of them more involved in Society activities.

We discussed the possibility of raising our basic dues from \$8 per year (unchanged since 1978) to \$10 in 1983. Charlie Derr, who was unable to attend the meeting, reported that, as of April 30th, 1982 our checking account stood at \$719.48 and savings at \$5,149.33, for a total of \$5,868.81. Total cost of printing and mailing our quarterly newsletter (and enclosures) has been running approximately \$1,100 per issue, so we are in fair shape for the rest of the calendar year. Charlie also reports that our \$1,000 bequest from the estate of Ted Sherman will shortly be turned over to him.

If any of your friends are interested in becoming members of the AMERICAN CANAL SOCIETY, I would suggest that you urge them to join, now! As of the close of our Fiscal Year, October 1, 1982, we will probably raise our single-membership dues to \$10 annually and make other adjustments to our dues structure.

Bill Shank

"Should the ACS try to create a greater interest in restoration of some of the main features of the 'Old Canals'. Also, should it give more support to groups such as the Portage Canal Society who are trying to revive their now derelict waterway?"

"Should the ACS try to stimulate more commercial operators to run trip boats along navigable stretches of the old canals?"

"How should the ACS gear itself for the 1980's? Are the newly created range of regional/state directors sufficient to meet future needs?"

Bill Moss, Fanwood, New Jersey — "My only thought, for the agenda now, would be to express support for the Canal Center at Easton."

(ACS has indicated its desire to cooperate with the Center for Canal History and Technology at Easton.)

# American Canals

BULLETIN OF THE AMERICAN CANAL SOCIETY

"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.

**WILLIAM H. SHANK, P.E.** — President; Publisher of "American Canals" — 809 Rathton Road, York, PA 17403

**Capt. THOMAS F. HAHN, Ed. D.** — Editor of "American Canals"; President Emeritus — Box 310, Shepherdstown, WV 25443

**Dr. WILLIAM E. TROUT III** — Vice President; Editor and Publisher of "American Canal Guides"; Chairman, Canal Parks Committee — 1932 Cinco Robles Drive, Duarte, CA 91010

**CHARLES W. DERR** — Secretary and Treasurer — 117 Main Street, Freemansburg, PA 18017

**LOUIS J. CAHILL** — Director for Canada — P. O. Box 745, 215 Ontario Street, St. Catharines, Ontario L2R 6Y3, Canada

**Dr. ROGER W. SQUIRES** — Director for the United Kingdom — Bailiff's Cottage, 4 Manor Way, Beckenham, Kent BR3 3LJ, England

**TERRY K. WOODS** — Director; Chairman, Canal Index Committee — 6939 Eastham Circle, Canton, OH 44708

**WILLIAM J. McKELVEY, Jr.** — Director; Chairman, Canal Boat Committee — 103 Dogwood Lane, Berkeley Heights, NJ 07922

## NOTICE TO CANAL BOATMEN

The following Mauch Chunk Boats have been left in the Princeton Basin; — The "Mechanic of Freemansburg, A. O. Cartwright, builder." Boat No. 34 of New York Line, White Haven. Also, the forward box of a boat, name or number not known. The owner or owners are requested to take them away before Saturday, the 25th of June next, or they will be sold at Public Sale on that day to pay expenses.

Naomie, of Penn Haven. No. 925 N.C. Reg. J. H. and D. Bowman, builders, Stern box of boat Judge Dingman, of Penn Haven.

Mountaineer, of Penn Haven. Stern box of boat General Taylor, of South Easton,

Boat Mary Ann, home not known.

One boat without name or number.

By Order, J. A. Perrine,  
Agent D. & R. C. Company,  
Princeton Basin, May 16, 1853.

(Published in WEST JERSEYMAN (Camden) June 1853, Courtesy Bill McKelvey)

## UNION WEIGHLOCK IN 1970



Photo of the Union Canal Weighlock at the "Waterworks" west of Lebanon, PA, before its destruction. (Photo by Bill Etchberger, about 1970)

## CLASSIFIED ADVERTISEMENTS

**Lost Canallers** — If you have been a member or still are a member of any canal society in the United States, Canada, or England and live in Southern California, especially in the Los Angeles area, please contact Bev Wm Morant at 61 West Bonita, Sierra Madre, CA 91024 or call 213-355-7280. Possibly we can get together with other canallers who left their home states to live in California and who wish to form a canal society in the Los Angeles area.

**Wanted** — Plans for a Schuylkill Canal boat and a model builder interested in building a museum quality model. Contact Bill McKelvey, 103 Dogwood Lane, Berkeley Heights, NJ 07922.

**Wanted** — Information on an English canal engineer named Hughes who came from Ireland to the U. S. 1830-1840 and who had a daughter named Mary born in Pa. c1843/5. Write: Elizabeth McGlohn, 1809 24th St., South, Arlington, VA 22202.

## PALINURUS "SPECIAL" TO ACS MEMBERS



Continental Waterways, operators of the "Palinurus" (shown above) a 16-passenger hotel boat, which cruises the Canal du Midi and the Canal Lateral a la Garonne in southern France, are this summer offering a special 20% discount to ACS members. The regular trip is six days long and includes three meals daily and excursions to local points of interest along the route. Several of our members have taken this boat and recommend it. Inquiries may be directed to Alison Field, Promotions Manager for USA and Canada, Continental Waterways, 11 Beacon Street, Boston, MA 02108. Phone: (617) 227-3220.



# ALEXANDRIA TIDELOCK EXCAVATION



Canal Archaeologist Tom Hahn at the upstream gate recess of the Tidlock emerging from the muck at the bottom of the lock.

The Alexandria Canal went 7 1/4 miles from Georgetown, District of Columbia to Alexandria, Virginia. The principal cargo carried was the coal from the fields west of Cumberland, Maryland. The coal was shipped via the Chesapeake and Ohio Canal to its connection with the Alexandria Canal at the Potomac Aqueduct. (See "The Alexandria Canal, *American Canals*, Aug. 1981.) The canal stepped down 38 feet to the Potomac River via a set of four locks at the Alexandria terminus.

Locks 2 and 4 are probably buried under modern buildings, but it is thought likely that Locks 1 and 3 were buried under the debris in two separate plots of land, available to excavation. Since Lock 1 (the Tidlock) was located at the Potomac River next to a wharf where the coal carried by canal boats was transferred to sailing vessels, the Tidlock and its basin just upstream (between the Tidlock and Lock 2) were considered to be the best place to attempt an archaeological dig. The locating of the lock would be the first step in the process to determine the practicability of restoring or stabilizing it for interpretation and further study. If the lock and its basin were found in a reasonable condition, they would be the only restorable property on the Alexandria waterfront. The lock and basin were built 1844-1845 and were last used in 1886.

Several month's study preceded any attempt at excavation. Used in determining the location and construction details of the lock and the basin were Engineer Maskell C. Ewing's field notebooks, historical, aerial, and modern topographical maps; historical correspondence, old newspapers, and other historical documentation; and ancient physical and modern map study.

The first phase of the excavation took place early in March when the downstream north lock gate recess was located right on target at the site of stones exposed in an earlier preliminary excavation, about two feet under the ground. Following excavations through May

revealed most of the lock and the basin remains in good condition, except for most of the coping (that is, the upper course of stone of the lock) which had probably been robbed for building purposes elsewhere. A deep excavation to the bottom of the lock (at about 15 feet) revealed that the wooden floor of the lock was intact, at least at the upstream gate recess where the excavation took place. The depth of the excavation and a steady flow of water precluded further examination with the equipment in use. At that location parts of the wooden gates were found, including a wicket gate and its frame.

Further study and discussions will attempt to determine the feasibility of restoring or stabilizing the tidlock and the basin remains.

*(Capt. Tom Hahn is the Field Archaeologist for the project under the Alexandria Archaeological Research Center headed by Pam Cressley. Funding for the project is from a grant from the National Trust for Historic Preservation.)*



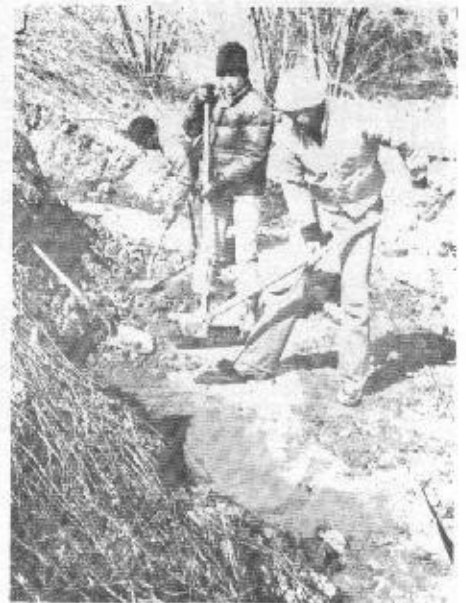
Modern machinery, such as this Bantam, was used to remove the overburden and for the basic excavation. Skilled operators can sensitively determine the type of material that they touch with their equipment.

## NEW PANAMA CANAL?

TOKYO (AP) April 14, 1982 — The government is likely to join the United States and Panama in studying the feasibility of building a new Panama canal, but has not made a final decision, the Ministry of International Trade and Industry said.

The Nationally circulated newspaper Asahi, quoting government sources, said Japanese participation on the committee would mean the country may help fund construction of a second canal.

An outline drafted by the Japan Chamber of Commerce and Industry calls for building a 61-mile, sea-level canal about nine miles west of the existing waterway.



Volunteers and Alexandria city employees, such as those working here at the upstream gate recess, were very helpful in the excavation of the site. The canal basin ties into the lock at mid-photo.



ACS Vice President Bill Trout, examining some of the gate remains, was one of the first to show an interest in the restoration of the Tidlock several years ago.

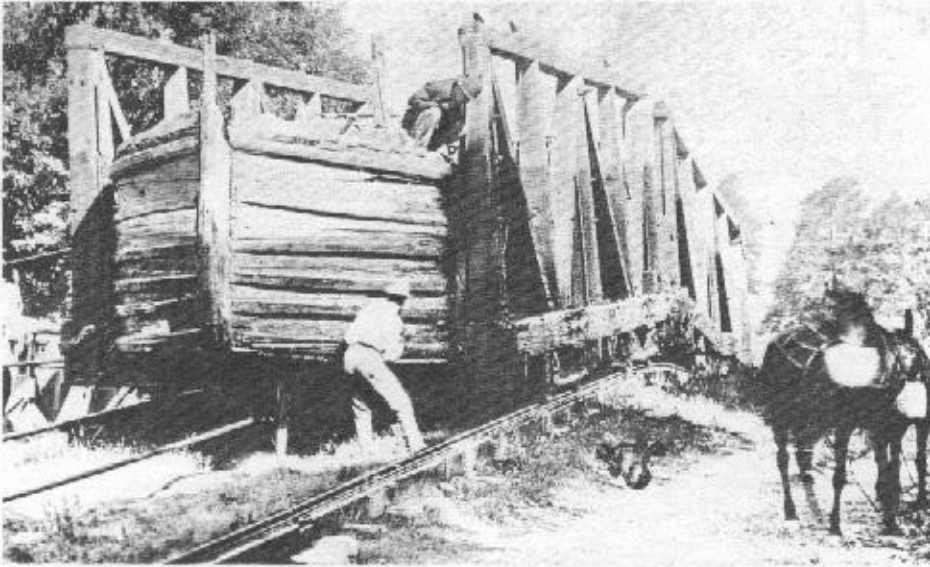
### MIAMI AND ERIE CANAL

Considerable damage was recently inflicted to the Miami and Erie Canal in the Providence Metro Park area, and a washout was reported at Ludwig's Mill.

The "Bluebird Special," which runs between Waterville and Grand Rapids along the line of the Miami and Erie Canal, on weekends, is expected to make its first trip 1 June, perhaps with a rebuilt steam engine.

*(From Canal Society of Ohio Newsletter for April 1982.)*

## CANAL LOCKS AND INCLINES



An inclined plane on the Morris Canal, showing a canal boat on a cradle, going over the "hump" into the upper canal level. Both boats and cradles were hinged in the center to permit smooth passage over the "hump." This boat was stopped, while repairs were made, before re-entering the water.

*(The following concludes an excerpt from an article in Engineering, Vol. 1, June 8, 1866. Engineering was a periodical published in England. The first section was published in AMERICAN CANALS Number 39.)*

When a great fall is to be surmounted, the series or flight of locks rendered necessary possess the great disadvantage of requiring a considerable time for the passage of the boats through them. This, combined with their great expenditure of water, has led to the adoption, in some cases, of other means for raising and lowering the boats from one level to another. These contrivances may almost all be included under two heads, viz. perpendicular lifts and inclined planes. Of the former there are but few examples, whilst the latter have been adopted in many instances, both in this country and abroad. Perpendicular lifts for raising boats, 26 ft. long by 6 ft. 6 in. beam, and 2 ft. 3 in. draught, carrying about 8 tons of cargo, were erected on the Western Canal, near Taunton, by Mr. James Green. The greatest change of level to which these lifts were applied was 43 ft., and the expenditure of water was stated to be about one-eighth the weight of the cargo, or, including leakage, one-fourth that weight. The application of inclined planes to canals is, like many other things, said to have been first carried out by the Chinese. However that may be, their first employment on the modern canal system is due to William Reynolds, who introduced them on the line of the Shropshire Canal in 1792. These inclines are four in number, and are named, respectively, the Hay, the Strichley, the Donnington Wood, and the Wombridge inclines. The first two, which rise together 350 ft., extend from the Severn at Coalport to the summit of the Shropshire Canal; the two others descend from the summit to the level of the Trench lock, the fall being 195 ft. The inclination at different parts of the inclines varies from 1 in 5 to 1 in 15. Each incline has a double line of parallel "ways," those of the Wombridge incline being formed of wrought-iron rails, and those of the others of cast-iron frame plates resting, upon longitudinal balks 10 in. by 6 in., these in their turn being supported by cross sleepers. The ways extend from below the water-level at the foot of each incline to above the water-level at its summit, and thence descend into the water in the upper bay. The cradles, which are stongly made, run upon

four wheels placed within the frames, but they are also furnished with two other wheels fixed outside the frames, these last-mentioned wheels only coming into use when the cradle has surmounted the incline and is descending into the upper bay, when they come upon a pair of elevated rails, and keep the boat level as it is entering the water. Each cradle is furnished at its fore part with an elevated frame or "carriage head," which is strengthened by a pair of back stays. These latter are connected with the hauling rope, which is of wire, by means of a chain bridle, and by this arrangement the rope is sufficiently elevated to allow a boat to pass under it. The cradles cost, complete, about 90*l.* each.

From each cradle (of which there is one on each line of ways) the rope is led round a pulley, 6 ft. in diameter, placed over the upper bays, and thence down the inclines to a 6 ft. drum driven by a steam engine. The engines employed are from 16 to 20 horse-power, and, in addition to the drum just mentioned, they drive a "winding-out drum," the use of which will be explained directly. The manner in which the inclines are worked is as follows: Let us suppose that the two cradles are one in the upper bay and one at the foot of the incline, and let the boat which is to pass down be loaded, and that which is to pass up empty. The former is then placed on the upper and the latter upon the lower cradle, and the upper cradle is then hauled out of the top bay to the summit of the incline by means of a chain attached to its lower end and connected with the winding-out drum. When the upper cradle has been thus brought to the summit of the incline, it is held there by the man at the brake-wheel connected with the winding drum, and the winding-out chain is uncoupled from it and thrown on one side. The brake is then released, and the loaded boat and cradle descending the incline hauls up, by means of the wire rope connected with the winding drum, the empty boat with its cradle. Shortly before the latter reaches the summit of the incline the winding-out chain is attached to it, and the engine being disengaged from the "winding out," and connected with the "winding" drum, it is drawn over the summit, its descent into the upper bay being regulated by means of a brake applied to the winding-out shaft. If, instead of as above supposed, it is the ascending boat which is loaded, and the descending one empty,

the extra power required to raise the former up the inclines is supplied by the engine, which is then connected with the winding drum during the whole of the time. The boats worked up the inclines are 20 ft. long, by 6 ft. 3 in. beam, and have a draught of 8 in. when empty, and 28 in. when loaded; eight is the greatest number which can be passed up in an hour, the hands employed being an engineman and boy at each summit, and a man to place the boats on the cradles at the foot of each incline.

In the case of some canal inclines the boats, instead of resting directly upon the cradles, are carried in tanks or caissons in a floating state. The inclines on the Chard Canal, erected by Mr. Sydney Hall, and that at the Blackhill locks of the Monkland Canal, constructed by Mr. Leslie, belong to this class. On the Chard inclines the caisson containing the boats are hauled up by water power; the caissons, however, are only adapted for taking up boats of 8 tons burthen. The time occupied by each boat passing the incline is about ten minutes.

The incline at the Blackhill locks of the Monkland Canal was constructed in 1850, in consequence of the suspension of the traffic which had been caused during the preceding year by the scarcity of water.

The difference of level at Blackhill is 96 ft., and before the construction of the incline the whole traffic was conducted through two sets of locks, each set consisting of four double locks, and each double lock having two lifts of 12 ft. each. The quantity of water expended by each boat in passing is 12,600 cubic feet, or about 350 tons of water. The caissons and carriages on the incline have been constructed for the transfer of empty barges, the loaded boats still passing through the locks, and this has enabled the works to be executed at a less cost than they otherwise would have been.

The incline consists of two lines of rails, each laid to a 7 ft. gauge, the length of the incline being 1040 ft., and its inclination for the greater part of its length 1 in 10. On each line of rails runs a carriage, set higher from the rails at its after than at its fore end, so as to support in a level position a caisson or tank 70 ft. long by 13 ft. 4 in. wide by 2 ft. 9 in. deep. These caissons are made of wrought-iron plates, and their form in cross section is such that they almost fit the boats placed in them, and thus have to carry very little water. The carriages are arranged so that one ascends whilst the other is descending, and *vice versa*, and each is connected by a 2 in. wire rope with one of a

*(Cont'd on Page 5)*



World highest lift-locks at Peterborough, Ontario, on the Trent-Severn Waterway. The two, opposing hydraulic cylinders raise and lower boats 65 feet from one level of the canal to another. (Photo by Tom Hahn).

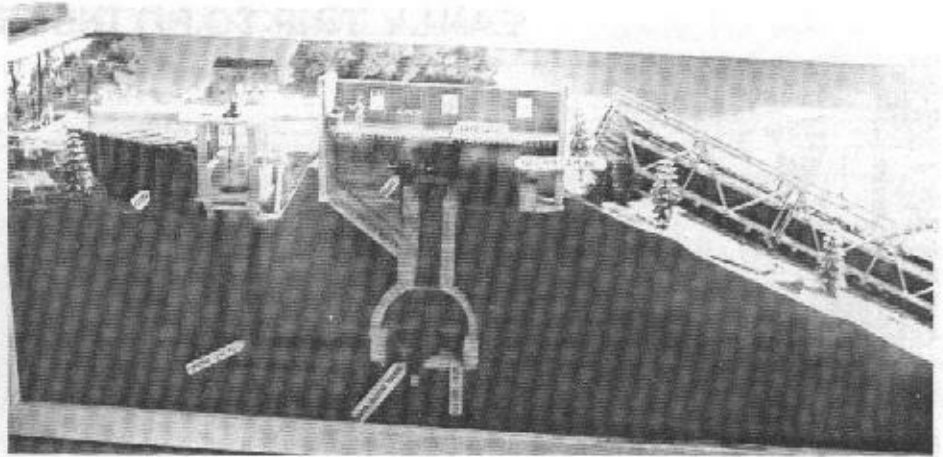


(Cont'd from Page 4)

pair of vertical drums, 16 ft. in diameter, placed at the head of the incline. These drums are fixed up on separate shafts, so that they move in opposite directions; and they are connected with a pair of high-pressure engines of 25 horse power, which make about twelve revolutions to one made by the drums, and drive the latter at a surface speed of about two miles per hour. The caissons are provided with lifting sluice-gates at each end, and one of them being run down in to the water at the foot of the incline, a boat is placed in it, and the end gates closed. This caisson then runs up the incline, the other caisson, which is filled with water, at the same time descending on the other line of rails; by this arrangement the one caisson nearly balances the other and little power has, consequently, to be exerted by the engine. On the arrival of the ascending caisson at the top of the incline, the upper end of it is pressed, by an hydraulic arrangement, against the frame of the gates of the upper level; these gates, and the gates or sluices at the upper end of the caisson, are then lifted, and the boat floated out into the upper reach. About ten minutes are occupied in taking a boat from the lower to the upper level, about five or six minutes being taken up by the actual ascent, two minutes being required for placing the boat in the caisson, and two minutes for removing it from the caisson into the upper reach. As, however, a boat can be placed in one caisson whilst another boat is being removed from the other, a boat can be passed up every eight minutes, and sixteen boats have been passed in two hours. Each carriage, with an empty boat and the water necessary to float it, weighs between 70 and 80 tons, but this weight can be reduced by taking up less water in the ascending caisson than is capable of completely floating the boat contained in it.

To prevent accident in case of the rope breaking, a line of ratchets is laid by the side of each rail, the carriages being provided with pauls which engage in these. In the case of the ascending carriage, the pauls are constantly working the teeth of their corresponding ratchets; but in the case of the descending carriage, this, of course, could not be allowed, and the pauls belonging to it are therefore raised from their ratchets, but are held in such a manner that they are released by the action of the draw-spring and allowed to fall into the teeth immediately upon the rope becoming broken. When a boat is being transferred from one of the caissons to the upper level, a small quantity of water (about 50 cubic feet) is enclosed between the gate of the caisson and that of the upper reach; this water is caught by a trough, and conveyed to the upper basin of the set of locks. In 1851, the year following the completion of the incline, it was reported by the company that 5452 boats had passed over it, the average daily number in April that year being 43, and that the saving of water effected by it had amounted to 60,000,000 cubic feet. In the succeeding years the number of boats passed has been considerably increased, and the saving of water effected has been consequently greater. The saving of 60,000,000 cubic feet effected in 1851 would be equal to about two months' supply to the locks for the trade then carried on. The entire cost of the incline, including engine-house, caissons, ropes, &c., was 13,000*l*, and the annual expenditure for working and maintenance has been about 450*l* per annum.

In America there are some good examples of inclined planes on the line of the Morris Canal, 102 miles in length, which extends from the River Hudson at New York to the River Delaware at Easton. The canal ascends from New York, a height of 914 ft. to the summit, from which it descends 760 ft. to the Delaware, making a total rise and fall of 1674 ft. These



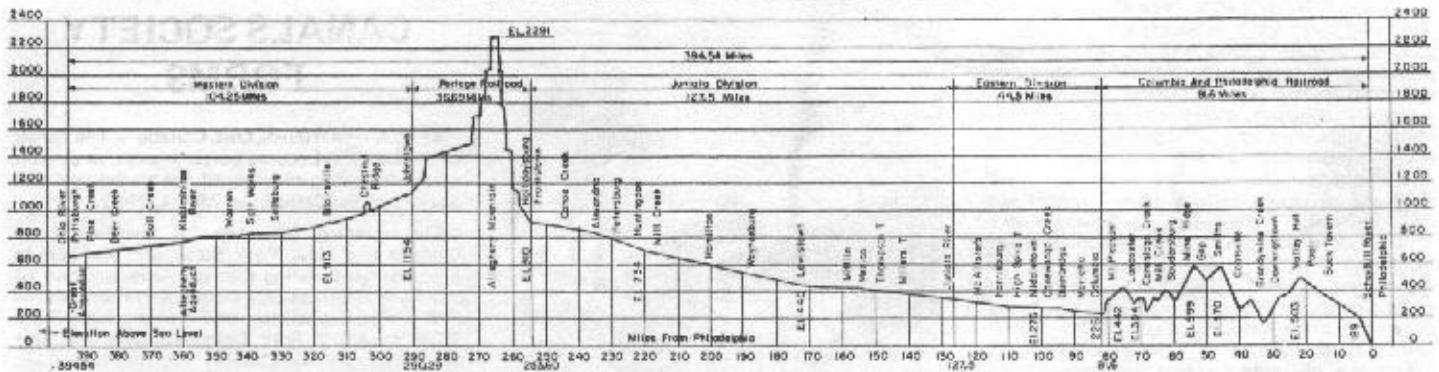
Model of a Morris inclined plane, with water-turbine driving mechanism, on display at the Canal Museum, Waterloo Village, NJ, maintained by the Canal Society of New Jersey. (Photo by Bill Shank)

changes of level are effected by twenty-six inclined planes and twenty-three locks, the longest plane being 1600 ft. in length, and rising 100 ft., and no plane having a less rise than 35 ft. An inclined plane was first introduced on the Morris Canal in 1845, but this plane was of imperfect construction, and the first incline of the class now used was set to work in 1848. This first plane, which was made at a cost, including the machinery, of 5567*l*, is 900 ft. in length, and rises 51 ft.: it superseded six locks. The boats used on the Morris Canal have an average tonnage of 60 tons, and are made in two sections, which when together are held by latches and steadying pins. Each of the sections had the end which abuts against the other section closed by a transverse bulkhead, so that each really forms a half boat. This method of construction was not adopted to suit the inclines, but was that originally used on the canal. We have said that 60 tons is the average tonnage of the boats; the planes are, however, arranged to transfer boats of 100 tons burthen.

Each of the inclines consists of a double line of rails laid to a gauge of 12 ft., the rails weighing 76 lb. per yard, and having heads 3 in. wide. The lines extend a short distance along the bottom of the canal at the foot of each incline, and thence rise up the incline to above the water-level of the upper reach. They then descend into the upper reach, and extend for a short distance along the bottom. The trucks upon which the boats are carried are, like the boats, divided into two sections, each section having eight wheels furnished with flanges on each side of the rails. The trucks are provided with strong stanchions, to which the two sections of the boats are secured by hawsers, and they are fitted with brakes by means of which any wheel may be locked fast as desired. From the upper end of each truck a wire rope, 2 in. in diameter, is led to the head of the incline, where it is passed half round a large sheave pulley, and thence back down the incline to the winding drum, which is 12 ft. in diameter and from 8 ft. to 12 ft. long, according to the length of the incline. This drum is furnished with a spiral groove of 3 in. pitch, and the ropes are wound on it in opposite directions, so that as one rope is wound on the other is unwound, and the carriages therefore move up and down the plane alternately. The ropes are supported along the centre of each line of rails by sheaves placed at intervals. Those ropes, which are of English manufacture, each consists of thirty-six 1/4 in. wires, whilst those made in America by Mr. Roebling are formed in 343 small wires. In addition to the main ropes above mentioned, the lower ends of the carriages on each incline are connected by a lighter wire rope, which passes round a large sheave at the foot of the

incline, and is used for hauling the trucks out of the water of the upper reach. The general inclination of the planes is 1 in 11, and they are each worked by a reaction water-wheel, the levers for regulating the supply of water and applying the brakes being arranged in a high tower, from which the man in charge can see the whole plane. The dimensions of one of the wheels are as follow: It has four arms, the ends of which describe a circle 12 ft. in diameter. The openings for the efflux of the water are 15 1/2 in. high by 3 1/2 in. wide, and the wheel being placed at such a distance down the incline that a head of water of 55 ft. is obtained, the discharge amounts to about 3000 cubic feet per minute. This gives about 235 horse power. The quantity of water which is required for working these reaction wheels is found to be less than half of that which would be expended in a series of locks of the same total lift. The working of one of these planes will be readily understood. The boat to be raised is floated upon the truck or cradle which is in the water at the foot of the incline, and secured to the stanchions already mentioned. The winding machinery is then set to work and the carriage hauled up, the carriage, as it rises, drawing (by means of the light wire rope connecting the lower end of the carriage) the other carriage out of the top reach and over the summit of the incline.

After the descending carriage is drawn over the summit, it of course acts as a balance-weight to the ascending carriage. The first boat tried on the plane which we have mentioned as being set to work in 1848, was taken up in 3 1/2 minutes, the weight of the boat being 70 tons. The planes on the Morris Canal were constructed under the direction of Messrs. Asa Whitney and W. H. Talcott, the chairman and engineer to the company, and the notes which we have here given concerning them were derived from information furnished to us by the last-named gentleman some time ago. In concluding this article, we may remark that the question — whether locks or inclines can be most advantageously used for effecting a change of level on canals? — is one which does not admit of a general answer. The advisability of adopting the one system or the other will depend, in each case, upon the supply of water which can be obtained, and upon the amount of traffic that is to be worked; under any circumstances, however, it seems that the cost of working can be reduced by making either the locks or inclines on such a scale as to transfer a greater amount of load at one time than most of them do at present. This, however, would require a large expenditure upon construction, and it will in each case depend upon the amount of traffic to be worked whether such an expenditure ought or ought not to be made.



A profile of the canal-rail route which Dr. Ward followed on his journey between Philadelphia and Pittsburgh. (Drawing by Willard R. Rhoads, 1960)

(The following are extracts from a Diary written by Isaac M. Ward, M.D. while traveling from Newark to Pittsburgh to attend the General Assembly of the Presbyterian Church.)

May 12, 1836 - Took the boat at Elizabethtown at eleven o'clock A.M., for Philadelphia. We were soon landed at Perth Amboy where we were carried by train cars to Bordentown. The face of the country, barren and uninteresting.

At three o'clock, P.M. took the boat at Bordentown, for Philadelphia. Saw but to admire the country seat of Joseph Bonaparte, near Bordentown, as creditable to the taste of its proprietor as it is admired by the passing traveler.

Arrived at the City of Brotherly Love at six o'clock P.M. Secured our baggage in the morning line for Pittsburgh, and looked about for a resting place for the night. Having secured it at the United States Hotel and having taken a cup of tea, we walked out to admire the meek taste and Quaker-like simplicity of Philadelphia.

Our steamer (leaving Philadelphia) had in tow about twenty cars containing the passengers of three different lines now traveling a common road to Columbia. Our ride today was through the counties of Chester and Lancaster, two of the richest and most fertile, and in many respects, most inviting counties in Pennsylvania. The country on both sides of the road most of the way was studded with beautiful farms more inviting to the eye than any I had ever beheld.

At five o'clock, P.M., we descended a plane of about the inclination, though much exceeding in length, that of our own at Newark and were landed at Columbia, having passed through no town of much importance save Lancaster, once flourishing, now withering and declining under the removal of the seat of Government to Harrisburg.

At Columbia we exchanged our cars with their panting, puffing, blowing, steamer for the more quiet though not more acceptable packet boat, "Dr. Leihman." Here we were stowed so closely that if it be said we were accommodated, it must be added "on a pinch." Number of passengers, fifty or sixty. Two and three tables were set morning, noon and evening, one after the other in succession so that it seemed that the time was whiled away with eating, eating, eating. We passed Harrisburg about twelve at night, the hour when, as by common consent, as many as were accommodated with berths had been conveyed over to the care of Morpheus so that I lost sight of the capital of Pennsylvania.

Saturday morning, the fourteenth - We have this morning left the banks of the noble Susquehanna along which we have finished our journey from Columbia now to follow the Juniata by means of the canal bearing the same name in all

its meanderings from where it empties itself in the Susquehanna to where it takes its rise in the Allegheny Ridge.

The country along the Juniata is rough and much of it is wild and uncultivated. The canal from Columbia follows the water courses first along the Susquehanna then along the Juniata. The scenery much of the way, particularly along the Juniata, is mountainous, grand beyond all your conception, and so sublime that the traveler as he gazes and drinks in its views, finding the boat drawing him away from it almost insensibly cries out stop! stop! On the whole, one is disappointed traversing Pennsylvania by the way of the canal as it seems one continual range of mountains from Columbia to the foot of the Allegheny.

We arrived at Hollidaysburg at the termination of the canal at five o'clock in time to ascend the mountain in the first morning cars. (of the Portage Railroad) We entered the cars, probably a hundred in all, and were conveyed to the foot of the first plane, a distance of four miles by horse power. The ascent here is so great that the returning cars attain as great rapidity as is compatible with safety from their own gravity.

At six o'clock, Tuesday morning, we entered the cars at the foot of the plane. When every-

thing was adjusted the signal was given by hoisting a red flag and in a moment the power was applied, and by means of the stationary engines, that the eye could just recognize in the distance at a seemingly great height, puffing, blowing and panting, and apparently as restive as the war horse that at the sound of martial music, longs for the bloody contest. After ascending plane after plane, five in succession, each one from one-half to three-quarters of a mile in length, you reach the top of the mountain where after partaking of that morning repast for which nature has now become impatient, you are permitted to look about you from this height of one thousand three hundred and sixty-five feet above the level of the surrounding country, and two thousand two hundred and ninety-three feet above tidewater, to breathe the pure air of heaven.

In our journey this morning we passed the most noble viaduct in the Union. (The Conemaugh Viaduct) The sublimity of the prospect opening to the eye was deepened by the remembrance that ninety feet underneath you is the bed of the Conemaugh River, spanned by this arch of eighty feet and upwards, and as you looked down the precipice beneath and cast the eye upward to reach the mountain top, your mind is overwhelmed with the vastness and the grandeur of the sight.

(Cont'd on Page 7)



Pennsylvania Packet Boat of the type on which Dr. Ward made his trip. Photo made (circa 1875) in the Thompsett Lock on the Juniata Division Canal. (Courtesy Dr. Ernest Coleman.)



## CANADIAN CANALS SOCIETY FORMS

**ST. CATHARINES, Ont. Canada** — The canals of Canada will become better known, as a result of the founding meeting of the Canadian Canal Society in St. Catharines, May 1, 1982.

The meeting attracted 29 members from Ontario and New York State, and was held in a converted building that formerly was part of the Muir Brothers Dry Docks operations, in the Port Dalhousie section of St. Catharines. From 1829 to 1932 Port Dalhousie was the port entrance to Lake Ontario for the first three Welland Canals.

Donald A. Smithias, manager, museums and archives, Peterborough Board of Museum Management, was elected President of the new Society.

J. Hayward Madden, Director of the American Canal Society, Livonia, N. Y., was elected Vice President. Other officers elected were: Secretary — Professor Rob Taylor of Brock University, St. Catharines, Ontario; Treasurer — George M. Carl, Former Secretary of Scott Misener Steamships, Port Colborne, Ontario; Legal Counsel — Marvin Kriluck of Beach, Keogh, Rogers & Grass, St. Catharines, Ontario. Tom Hahn, President Emeritus of the American Canal Society was appointed to the Board of Directors. Richard Cavagnaro, of the American Canal Society, Lockport, N. Y. was also present at the meeting.

The objectives of the Canadian Canal Society will be to preserve and promote Canada's canals. While many canals have either disappeared or been abandoned, others remain in active use for commercial and recreational purposes.

The chairman for the founding meeting, Dr. Wesley Turner of Brock University, stated there has been no central organizing body for canals in Canada, resulting in a lack of co-ordination. Pointing out that the 50th anniversary of the present Welland Canal, which is one of the most important canals in the World, falls on August 6th this year, he said "commemorating important anniversaries would be one job for the Society."

John White, a staff writer for the St. Catharines "Standard" had this to say about the meeting, in an account published May 3, 1982:

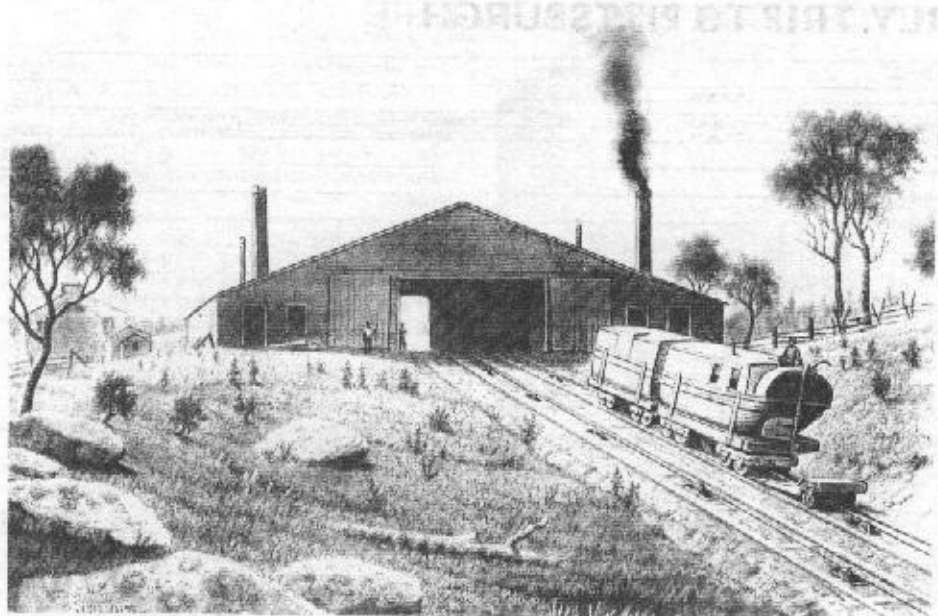
"Something has to be done to make sure people know the importance of canals in Canada's development, says Brock University history professor, Wesley Turner, speaking Saturday at the organizational meeting of the Canadian Canals Society, a group formed to study and preserve present and former canals. 29 people from Ontario and New York state met in Dalhousie House, a restored industrial building in Port Dalhousie.

"What has been clear in discussion is that there is a need for a society that can co-ordinate activities in relation to canals, Dr. Turner said.

"There is a need for a central collection agency to gather information and supervise activities; to make sure that different groups with the same interests don't work at cross purposes to each other.

"Dr. Turner, who was chairman of the meeting, said the idea for forming the society arose from discussions last year. People interested in the importance of the present and former Canadian canals decided there should be some kind of organization to be used as a central reference body — if for no other reason.

"The members watched a film about the canal then had a walking tour of historic sites in the former town of Port Dalhousie, which has been part of St. Catharines since 1961."



**Plane Number Six at the top of Allegheny Mountain on the Portage Railroad, as described by Dr. Ward. Note sectional canal boats being towed on flat cars. (Drawing by George Storm.)**

(Cont'd from Page 6)

The scenery on either side of the road on the declivity of the mountain is wild beyond conception and grand surpassing all description, though not as bold here as at other points, both north and south of us, yet to convey to the mind that has not contemplated an adequate conception of its sublimities is a task for me too Herculean.

Now commenced our descent, plane by plane till we were brought to the tunnel. The distance through the mountain is about nine hundred feet and is a saving of three miles in distance as well as money in its construction, namely less than the construction of the road would have been around the mountain. I walked through, having dismounted from the car, this subterranean arch. The excavation was through the solid rock. The entrances on both sides of the mountain were arched with stone to prevent the detachment of masses near the surface as well as to catch what might roll down the side of the mountain while the greater part of the way remains as it was left the day the stones were first removed by the hand of man.

[At this point there is a gap in the manuscript — which must have told of Dr. Ward's arrival in Johnstown, and his transfer from the cars of the Portage Railroad to a canal boat of the Western Division Canal. Later we find him entering the canal tunnel near Saltsburg.]

At nine o'clock we retired for the enjoyment of such accommodations as our baggage room would afford us, and at two o'clock were awakened by appointment to witness our passage through the tunnel. Yesterday we passed under and through the mountain in a rail car; tonight our passage will be by a canal boat. The arch-way is of about the same dimensions and the same distance with that which we passed on yesterday and the excavation, as in the other case, was made through the solid mountain limestone, but arched the greater part of the way, which as you look upon it conveys to the mind, and I may add in reality, affords greater security by protecting the passenger from detached parcels or masses of limestone that loosen and fall from the action of the air. I am informed that for months after the completion of the road, masses would become detached and fall, often proving the dread and sometimes the enemy of the traveler, which called for the artificial arch over and round you.

As you emerge from this subterranean passage and from the awful stillness with which one feels himself surrounded with such a mass of life and animation, we are borne by a splendid viaduct in a minute's sail over and above the Conemaugh River which we left as we entered the mountain to pursue its course for the space of three miles around. We then alternately follow it by its side separated only by a narrow bank, now plunging into its waters through a side lock floating proudly on its bosom and now, as it were, in a spirit of exultation, leaving it far beneath us as we wend our way above its waters from side to side or bank to bank. Along the banks of this river, within the distance of thirty or forty miles, we discovered from sixty to ninety salt works. The salt water is obtained by boring from three hundred to seven hundred feet below the surface. The water is raised in some cases by horse power but in most cases by steam and evaporated by a slow fire, great facilities for which are afforded in the large quantities of bituminous coal with which these mountains abound. On the side of the mountain, in the vicinity of each salt work, you may discover the mouth of a coal bed which supplies fuel for the establishment, and ever and anon your car would be saluted with the rattling of a rail car descending the mountain loaded with coal, and in its descent carrying up a returning car. In other cases you would see the coal, when brought to the edge of the pit, thrown into a trough and descend precipitately to the bottom of the mountain from whence it would be thrown into the furnace.

We followed the course of the Conemaugh River till it assumed the name of Kiskiminitas where it entered into the Allegheny. We crossed the latter river at an elevation of forty feet above the surface of the water by six or seven arches of one hundred feet span each, and pursuing our way along its banks on the west side we passed the village of Freeport where I observed about two thousand barrels of salt ready to be shipped to the southern market and at the dusk of evening on Wednesday we were brought within sight of Pittsburgh. Again we crossed the river and planted our feet on the soil of that memorable city, (Pittsburgh) renowned for the atmosphere being so surcharged with bituminous matter as to give to any other object its own distinctive hue.

(Provided by C. Prentiss Ward, M.D., ACS, 16 Dorothea Ter., Belleville, NJ 07109, the great grandson of Dr. Isaac Ward.)

## 1674 DUTCH LOCK GETS NEW LIFE



Muiden Lock on a busy day. (Photo by H. A. Van Lith.)

By Hans Van Lith

In the small town of Muiden at the river Vecht near the former Zuiderzee, in 1674 a lock was constructed. It was a complex of three locks, of which one could be used by the ships and the other ones to let out high water to the Zuiderzee. In times of war it was possible to inundate the country behind the dikes. So the "big sealock of Muiden" was a very important thing in those days. The construction was rather simple; the foundation existed of wooden piles and oak cross-beam joists. During the last centuries the extension of the lock changed, and the quality of the construction grew worse. At the end of the 1960's, the lock was placed by the government on the official list of cultural monuments. In the 1970's the 'Rijkswaterstaat', the national waterways board, decided to restore the lock, as far as possible in the original situation.

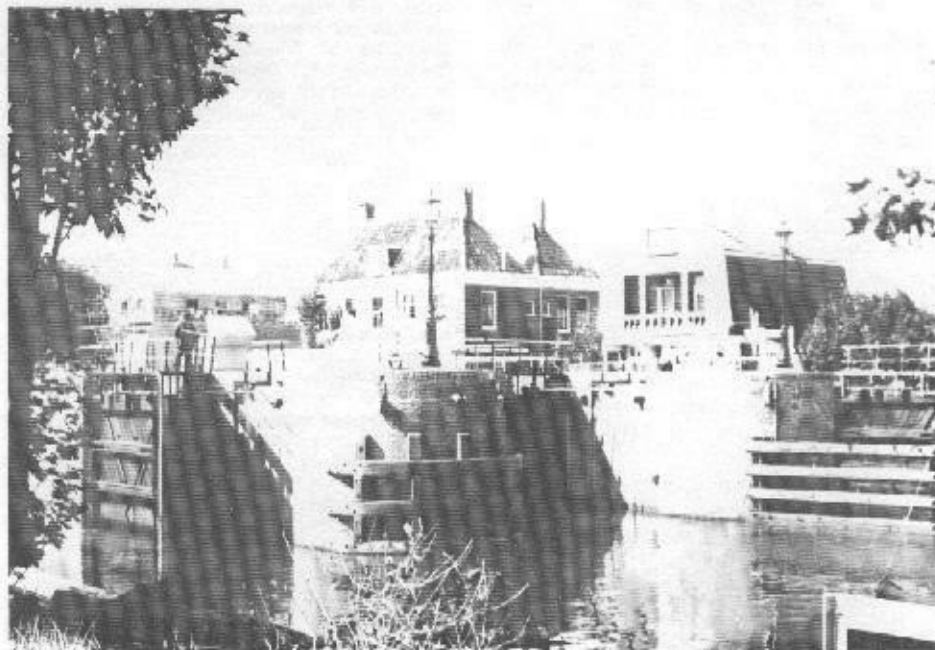
In the past the lock of Muiden grew more and more important for the shipping between Amsterdam and the Rhine. In 1811 it was in such a bad situation that extensive restoration was necessary. During that period the emperor Napoleon visited Holland. He was very much interested in the construction works in Muiden and visited the town on that occasion. Experts explained the works to him.

The restoration was just in time, because the lock had become so bad, that a high waterlevel on the Zuiderzee could make difficulties for the land behind the dikes, and the lock was not safe any more. Besides that, the salt water from the Zuiderzee came into the river Vecht underneath the lock.

In 1870 the drawbridge over the lock was replaced by a swivel-bridge. Later on, the steam tramway from Amsterdam to the region 'het Gooi' passed over it and the bridge became a bottleneck for cars coming from Amsterdam. The bridge was a toll-bridge and that caused much loss of time for the passing travellers. The private 'Direktie van de Groote Zeesluis' (Direction of the big sealock) had no more money

to repair the lock and year after year it grew worse. Sometimes the lock was out of function; ships couldn't pass or at least with great difficulties.

How does one restore a lock from 1674 in its original situation? A difficult question. The technicians of 'Rijkswaterstaat' went to the historic archives to look for old plans. The Governmental Archives still had some notes of the repair work of 1811, another one furnished still older plans. Divers went down into the lock itself to see how it was down below, and measurements were made. From all this information it was possible to make final plans for the restoration.



The Lock, as seen from the River Vecht (Photo by H. A. Van Lith.)

In the beginning of 1975 the outside work started. It had to be done as fast as possible, because the lock was allowed to be out of operation for one season only. The first thing was the cleaning of the lock. In 1813 the former owners published an order that people were not allowed to throw rubbish into the lock. If they did so, they should be punished! Nevertheless The Dutch did! When the lock was cleaned the workers found 125000 (!) kilos of refuse matter. Among it: old bicycles, wracks of small boats, and a lock gate which had been missing one day. Before the lock could be cleaned, two dams at each end of the lock were made. After that the lock was pumped dry, so the workers could go inside.

Much improvisation was necessary during the restoration. The lock gates were renewed. There are only a few specialists in Holland to construct wooden gates. The technicians of Rijkswaterstaat called it cabinetmakers work because the gates have to close very precisely. Some parts of the lock had to be replaced by concrete construction. But because the original exterior had to be preserved, special bricks of an old type had to be fixed onto the concrete. By looking very carefully at different bricksellers, a brick was found of the right measurements. It did not have the right original color, but the color was changed by using hydrochloric acid.

The old bridge over the lock had to be repaired too. Rijkswaterstaat made a plan for an electric swivel-bridge in the old style. The railings of the old bridge could be used for the new one. The lanterns of the old lock were another problem. These too were of an old type, which was out of use for many years. But, in the province of Friesland a factory still had the shapes to cast the lanterns. There was joy among the restoration technicians!

Part after part the sealock of Muiden got back its old exterior. Not quite, however, because the operation of the locks was not as originally. Now electricity is in use. The old capstans to open and to close the doors have been replaced, but they are only pretty ornaments now.

(Cont'd on Page 9)



# Pennsylvania Profiles

by Patrick M. Reynolds

## Profiles Books

Volume Five of Pennsylvania Profiles—"History & Mystery of Pennsylvania"—is now available for \$3.55 postpaid. A handsome boxed set of all five books is available for \$16.44. Make check or money order payable to P.A. Profiles and mail to The Red Rose Studio, 3 Flintlock Drive, Willow Street, PA 17584.

## Canal Pirates

FOR A PERIOD OF TWENTY YEARS, FROM 1840 TO 1860 THE PENNSYLVANIA CANAL WAS TERRORIZED BY ONE OF THE MOST VISCIOUS GANGS OF CUTTHROATS AND THIEVES IN AMERICAN HISTORY KNOWN AS THE

### Schuylkill Rangers.

ORIGINATING FROM THE VINE STREET SECTION OF PHILADELPHIA, THEY MOLESTED PEOPLE AS FAR UPSTREAM AS EASTON, FORT CARBON AND MIDDLETOWN.

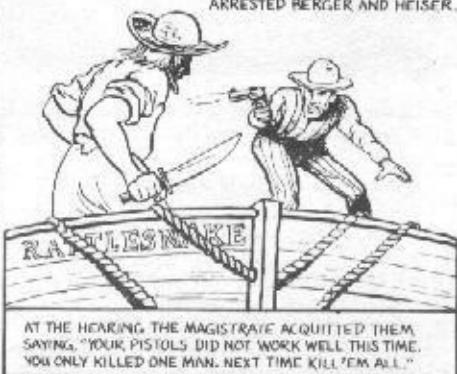


THE LEADERS OF THIS MOB WERE HARRY "RED" CARROLL AND A PRIESTHOOD SEMINARY DROPOUT NAMED "WILD BILL" KATON.

THE RANGERS WERE NOT ALWAYS SUCCESSFUL. ONE NIGHT HARRY BOYER OF READING WAS TAKING HIS BOAT THROUGH THE FAIRMONT DAM, EXPECTING AN ATTACK. BOYER LAY DOWN ON THE DECK ARMED WITH AN AX. WHEN SEVERAL RANGERS JUMPED ON BOARD BOYER RUSHED THEM, STRIKING LEFT AND RIGHT WITH HIS AX AND ROUTED THEM ALL.



ANOTHER TIME THE BOAT OF PETER BERGER AND ED HEISER OF CRESSONA WAS ATTACKED BY RANGERS IN PHILADELPHIA. IN THE FIGHT BERGER KILLED A RANGER BUT THE POLICE ARRESTED BERGER AND HEISER.



AT THE HEARING THE MAGISTRATE ACQUITTED THEM, SAYING, "YOUR PISTOLS DID NOT WORK WELL THIS TIME. YOU ONLY KILLED ONE MAN. NEXT TIME KILL 'EM ALL."

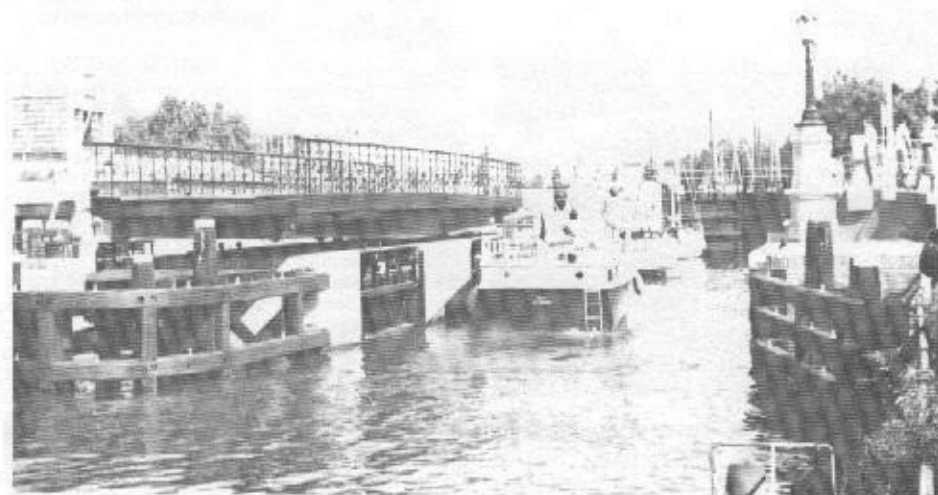
We are indebted to Patrick Reynolds for permission to reproduce his "Canal Pirates," one of a series of syndicated drawings being published in various Pennsylvania newspapers. He has done hundreds of these drawings and published several books under the "Pennsylvania Profiles" title.

(Cont'd from Page 8)

In August 1976, the old lock was reopened by the director-general of Rijkswaterstaat. For this event he used an old motor-sailkipper of Rijkswaterstaat from 1905! Bands and regional organizations assisted the party, and a special commemorative was struck.

Now the 'big sealock of Muiden' is one of the nicest places in Muiden. Many yachts pass it every summer season, and many people stop off to take photographs of the lock of 1674.

(Mr. Van Lith is editor of the house journal of the Netherlands Ministry of Transport and Waterworks. Address: Oosterloostraat 11, Voorburg (ZH), Holland.)



Muiden Lock, with the swing bridge open in the foreground. (Photo by H. A. Van Lith.)

## BRAZILIAN WATERWAYS

The Sobradinho Lock near Juazeiro, Bahia, on the Sao Francisco in Brazil was dedicated recently. The lock is in a hydro dam and measures 120m x 17m with a maximum lift of 33.5m. The President of the Republic was present for the dedication. The first boat to officially go through the lock was the sternwheeler steamer SAO FRANCISCO built about 1910. The boat and her sister ships have been in regular service on the Sao Francisco between Juazeiro and Pirapora, Minas Gerais. The boat was built and supplied in knocked down or kit form by the old James Rees & Sons Company in Pittsburgh.

The hydro project on the Tocantins River at Tucuruí, Para, is proceeding. This will become the third largest hydro project in the world. Two locks, 200m x 33.5m, each with a 34.5 lift, will be at the ends of a 6 or 7km canal bypassing the dam. This dam will back water up to Marabá. Other hydro dams with locks are projected for the Araguaia. In the near future the Brazilians plan to interconnect the Araguaia and the Parana via their respective tributaries, the Diamantina and Verde Rivers. They are not afraid to think big.

(Submitted by Ross Rogers, J., Marine Surveyor, ACS, P. O. Box 148, Sewickley, PA 15143. Ross has promised to send photos of the projects when received from friends in Brazil.)

## TOUR OF FLORIDA'S CANALS



St. Lucie Lock, looking west. Tidewater is directly behind the photographer. Boats in the lock are headed for Lake Okeechobee. (Photo by Alden Gould.)

By Dr. W. E. Trout & Alden W. Gould

We made plans to cover the entire region of canals south of Fort Myers and eastward sections of the state, including Lake Okeechobee. Then northward to Port Charlotte to visit two small locks that were built for the General Development Corporation.

**First Day Tour:** We left Fort Myers, Florida on March 29, 1982. Our first stop was at Clewiston, where a new lock was constructed at the Hoover Dike. This is a navigation lock 50 x 60 ft. in the chamber, completed in January 1980. Leaving here we took route #27 to Lake Harbor where the Miami Canal is located at its north end, and, adjacent to the Hoover Dike which was built in the 1930's. There is one concrete lock here with its two wooden gates. This structure is in excellent condition today, and can be walked on full length. It has a large plaque at the gate entrance to the property which is fenced in, and also the locktenders house with high stilts supporting the structure. We were greatly pleased that action has been started in the right direction for a very attractive State Park with a beautiful view of the Miami Canal looking south.

The upper part of the Miami Canal was begun by Disston in 1902 in an attempt to link Lake Okeechobee to Shark Valley and Florida Bay. He followed the stream-bed of the Ritta River southward, past this point and less than 12 miles encountered hard rock that the dredge could not handle, where he had to abandon the project. Construction of the canal was revised later, and the lock and the locktenders house were completed in 1919.

Leaving this site our next stop was on route #441 in Belle Glade. Here we crossed over the North New River Canal to view the upper lock which is today only one half of the lock chamber, the other chamber wall having been removed some years ago. The canal can be viewed in a straight line for many miles ahead southward. All canals in Florida serve as drainage canals. This canal was also a navigation waterway to Fort Lauderdale. Small craft can use this canal today within the limits of boat ramps.

We left the North New River Canal and drove farther northeast to the Hillsboro Canal in its upper reaches towards Lake Okeechobee.

There was a lock located near to the Hoover Dike, but it was removed subsequent to 1973. The lock was known as "Chosen's Lock." The Hillsboro Canal in the early 1900's was a navigation waterway as well as a drainage canal, flowing southerly through the Everglades.

For the rest of our first day enroute we used route #27 and route #84 on our way to Fort Lauderdale. We followed the North New River Canal entirely on the drivers side the entire distance, which was about 61 miles. This canal was the first one to be opened and placed in operation for barges and steam-boats from Fort Lauderdale to Lake Okeechobee.

At the first lock of the North New River canal near Fort Lauderdale there is ample parking, picnic tables, restroom facilities will be provided later when the small locktenders house has been renovated. This lock is in an excellent condition today, but more work is yet to be done on its wooden gates, plus a few other projects yet considered before this site is due for its **Grand Opening**. This lock was



Lock Number One on the North New River Canal, Fort Lauderdale, Florida which operated as part of the Everglades Drainage District 1912-1930. The old lock (130' x 25') is in excellent condition.

completed structurally in 1912, completed fully in 1913. This Historical Lock is 130 x 25 feet in its chamber.

Outside of the fence are located plaques which tell to visitors the story of this great enterprise in the draining of the vast Everglades during the 1900's. In that era that Gov. N. B. Broward who initiated the drainage of the Everglades on July 4, 1906 at Fort Lauderdale. This vast enterprise extended throughout various sections of the state. The main canals were for drainage, but also used for navigation by steam-boats and barge traffic.

**Second Day Tour:** Bill and I decided to locate the South New River Canal and its one lock. We had no trouble at all in locating it. There is one lock here in excellent condition today, less its wooden gates. There are a few pilings still in place at the west end of the structure. This lock is of concrete construction 22 x 90 feet. It is readily available from its parking lot off Griffins Road. This is a beautiful canal and extends WEST through a conservation area where it joins the Miami Canal. This canal, like all of the others visited, appear to be very well watered. This canal was also a navigation waterway for some time, but not operational to the extent used by other main canals.

Leaving the South New River Canal now, Bill and I drove over to the new location of the Broward County Historic Commission on New River Dr. at the L. Clayton Historic Building, headquarters for all activities with regard to the historic preservation of canals and other structures. We spent about two hours looking over many of their photos and maps of the region including the canals and their preservation activities.

In leaving this location, we picked up route #27 again going south to Miami and the Miami Canal. We were following this canal closely for many miles. Really a very attractive canal through many residential areas where the older homes were right close to each other at the canals edge. We continued further south on the canal, hoping that we might locate the old lock at the lower end of the canal. We located what we thought should be its former site.

In leaving here we took U.S. #1 again, heading north for Deerfield and the lock located at the southern end of the Hillsboro Canal. The old locktenders house had been removed, but the old water tower was still standing. This lock is located at the lower reaches of the Hillsboro Canal at Deerfield and about 2-3 miles from U.S. #1. This Canal today serves the same drainage purpose as all other main canals. During the early 1900's this waterway was a navigation canal to Lake Okeechobee. There were two locks at one time, now reduced to the one at Deerfield. This lock is still in excellent condition.

Leaving Deerfield, we next stopped at West Palm Beach. Located here is the West Palm Beach Canal which is very interesting to visit. This lock site is the outflow of the canal into salt water. This lock is 130 x 25 ft. in its chamber. The lower gate appears to be of concrete today, but in its early years we presume they were all wooden gates. The upper gates at canal level also have the recess for wooden gates, but not used today. Now installed in their place is a vertical lift gate to control the speed of water for flushing silt. Our tour for the second day ended at West Palm Beach.

**Third Day Tour:** Leaving West Palm Beach we used U.S. #1 to Stuart, Fla. Our tour included a visit to the St. Lucie Canal Locks. I had visited this site before over the years, but for Bill it turned out to be a super-special "Holiday" so to speak. There was a lot of activity while we were there, quite a few boats passed through the lock, including a cruise boat

(Cont'd on Page 11)



of good size. I talked with the Locktender, explained our mission, who we represented, etc. He then gave us the go ahead to look at anything of importance to us. We took him at his word and spent about two hours at this site. He also volunteered additional information, charts, maps and old history dating back to the Old Original Lock which lies buried in its original site today. It has been filled in for 30 years or more but the cap stones are still on the surface full length of the lock, with a set of gates at its entrance. This lock was 150 x 30 ft. The regular navigation lock restrooms, a picnic area, and tables.

Leaving here we followed the canal on route #76 to route #441, the site of the new Port Mayaca Lock at Lake Okeechobee. Before we visited this lock Bill wanted to view the lake at Canal Point.

When we arrived at Canal Point we walked up to the top of the Hoover Dike to view this 740 sq. mile Lake Okeechobee. Bill remarked, it was just like looking at the ocean. While we were at Canal Point we visited the upper lock of the West Palm Beach Canal. This lock 130 x 25 feet, still has its wood gates, and is in very good condition today. From the south end of the lock one gets a beautiful view of the canal for many miles. This canal served for drainage, but in the early 1900's it was also a navigation waterway for steam-boats of good size and barges. The West Palm Beach Canal was largest, deepest and shortest of all main line canals, and also the last main line canal constructed.

We then drove back to the Port Mayaca Lock. This new lock was completed in 1977. It is 400 x 56 ft. has sector gates, also 4 spillway vertical lift gates 29 ft. wide by 19 ft. high, manually operated. This lock site is rather unusual, due to building of a half moon shaped dike (like the Hoover Dike) out in the Lake. But it ends join the Old Hoover Dike. Therefore, the large lock was constructed in the middle between both wing type dikes. Public facilities here are now completed. In leaving this site we drove on route #441 to the northern end of the Lake to view the Taylor Creek Lock set into the Hoover Dike. This was formerly a Hurricane Gate, but was rebuilt into a navigation lock.

There is what is known as a Rim Canal around outside of Hoover Dike, which passes directly in front of the Taylor Creek Lock. Leaving here we picked up route #78 on the west side of the lock that connects Lake Okeechobee with the Caloosahatchee River, also known as the "Okeechobee Waterway." This lock is 250



Upper vertical gate of the West Palm Beach Canal lock (135' x 25') just above tidewater. The lock is not operational. It was a part of one of the main canals serving for drainage and navigation in the early 1900's (Photo by Alden Gould)



A cruise boat in the St. Lucie Lock, headed for Lake Okeechobee (looking east). This lock is 250 feet long, by 45 feet wide. The old, original lock is to the left of this view.

x 50 ft. The grounds are well kept up by the Corps of Engineers. Camping and picnic areas are provided, as well as restrooms, and parking areas, etc. A beautiful site to visit.

Bill and I had quite a nice visit with the locktender on duty. They are alone a good share of their duty time, therefore they welcome conversation with visitors. We then left this site and took a short drive down to the location of the Old Sawn off Cypress Tree. In the very early days of river navigation to the Lake, or Lake to river navigation there were no markers of any kind (this was before the Hoover Dike was built) to guide the Skippers into the canal. This tree was the landmark they used for many years. It still stands today, just as it was in those early years. At its base is an Historical Marker. Also one wall of a former lock site, about 50 ft. from the tree.

We continued on route #78 on the north side of the "Okeechobee Waterway." We made two more stops on our tour, the Ontona Lock first and the Franklin Lock last. The Ontona Lock is located on the Caloosahatchee River. (Okeechobee Waterway) There is a camping area for travel trailers. Boats enter the lock at high water, then drop about 8 ft. to the river level. The lock is 250 x 50 ft. and is operated by the Corps of Engineers.

Our last stop was at the Franklin Lock at Olga where there is a park provided by the Corps of Engineers for public use. It has a rather elaborate picnic area with tables and shelters, nice restrooms, water supply, grills for cooking and small boat ramps, indeed a very nice park in every way. The spillway at the lock is on this side of the river. In order to really see the entire lock and walk upon it should be done from the route #80 entrance. This lock is 400 x 56 feet, the same size as the Port Mayaca Lock we visited earlier. This is the last of the locks on the Okeechobee Waterway. It is a very important structure since it controls the fresh water level at its east end and prevents salt water from entering at its west end. Water for public use is taken from this river, treated and then pumped to Fort Myers and many other districts.

Fourth Day Tour: On April 1st 1982 we visited the two small locks built for the General Development Corporation at Port Charlotte, Florida.

We both had a swell time on our tour. Both of us enjoyed the many sites we visited and the people we talked with regarding preservation and restoration of our former canals and waterways that still remain in good or excellent condition today within the State of Florida. The state of Florida has over 433 miles of canals.

## CLOSING OF FOX RIVER LOCKS

As one of the Reagan economy cuts, the Corps of Engineers announced that the Fox River in Wisconsin between Neenah and DePere is one of the nation's many waterways on which it is going to reduce maintenance. This would mean the end to operation of the locks which last year recorded a record number of transits between Lake Winnebago and Green Bay. Some feel that the waterway should be kept open in accordance with the Northwest Ordinance of 1787 which called for all navigable tributaries of the Mississippi and St. Lawrence rivers to be "highways and forever free." The Fox River Waterway was an important factor in the early development of the State of Wisconsin and has remained an asset throughout the years.

Frederica Kleist wrote in February: "The Portage Canal Society has researched and has proof that a right of way exists. We are presently working to raise enough money to take the case to court as the present owners do not acknowledge the ownership of this right of way. In the meantime, the Society encourages the use of the canal by canoeist. The Fox River at the east end of the canal offers an extended canoe trip into a rural like setting which abounds with wildlife." Included with the Kleist letter was a copy of a letter from the St. Paul District, Corps of Engineers stating that the Corps would "determine ways to make the Portage Canal more attractive, primarily at the Wisconsin River Lock."

In March, Henry Abraham wrote: "In 1951, Portage had an incident which bears remembering and hopefully will not be repeated. The locks at Portage, Wisconsin on the Portage Canal were closed, one welded shut and the other bulldozed in to form an earthen dam. This was done without notice, spoiling this part of the Fox River Waterway. The reason given was a lack of funds. If this procedure is allowed again, what is to become of the canals and locks? In fact, the whole waterway system. Would it not be cheaper to keep them in operation?" Ms. Kleist asks that ACS members write their views to their Congressmen and also to Wisconsin Senators Robert Kasten and William Proxmire, and to Wisconsin Representative Robert Kastenmeier.

(Henry Abraham, ACS, is President of the Portage Canal Society. Frederica Kleist, ACS, is the Corresponding Secretary. Additional information for the article came from the Portage Daily Register.)

## ACS PRESIDENT SPEAKS AT DEDICATION



ACS President Bill Shank (center) was the key-note speaker at the June 6th dedication of the restored Susquehanna (Canal) Museum of Havre de Grace, Maryland. Left to right: Ellsworth B. Shank, Museum Board Chairman; Charles D. Montgomery, Mayor of Havre de Grace; President Shank; William S. James, Treasurer of the State of Maryland; and J. Dudley Digges, Chairman of the Maryland Heritage Committee. The Museum is the original lock-house building at the outlet lock of the Susquehanna and Tidewater Canal.

## LOCK "SHUT-DOWN" AT 3-RIVERS??

The following UPI release hit newspapers in Pennsylvania, February 21, 1982: Western Pennsylvania's Congressional delegation has asked for a meeting with Reagan administration and U.S. Army Corps of Engineers officials to discuss the impact of proposed budget cuts on lock and dam operations in the region.

Rep. Joseph Gaydos has enlisted six other congressmen in requesting the meeting with river users, Budget Director David Stockman, Secretary of the Army John O. Marsh, and Corps officials.

Gaydos said the delegation is worried about proposals to cut the 1983 budget so much as "to effectively throttle commercial river traffic on the Monongahela and Allegheny Rivers." The proposals would cut Allegheny River facility funding from \$2.3 million to \$203,000.

"What that means," Gaydos said, "is that all locks and dams on the Allegheny will be closed and kept in caretaker status. They might just as well preserve them as museum pieces."

The congressmen, joined by Sen. H. John Heinz, said in a letter to administration officials:

"We believe a way can be found to deal with this unique and economically dangerous situation if all parties involved can meet face-to-face."

In this same connection, J. Stuart Elsner, P.E., President of the Pittsburgh Chapter of the Pennsylvania Society of Professional Engineers sent a letter to H. John Heinz III dated April 5, 1982, as follows:

"The recent determination by the United States Army Corps of Engineers District Office to curtail the hours of operation of four locks on the Allegheny River and three locks on the Monongahela River is more "economic bad news" for western Pennsylvania.

"Many are concerned that this is just the first step in a series of steps to curtail the operation of the locks on the rivers of this region.

"The enclosed Resolution adopted by the Pennsylvania Society of Professional Engineers Pittsburgh Chapter, is our statement of opposition to the lock curtailments proposed by the Army Corps of Engineers for 1982 and the President in his proposed budget for this Federal Fiscal Year."

## ACS Activities in United Kingdom

Dr. Roger Squires, our ACS Director for the United Kingdom, sends the following report on activities there:

The ACS UK Section holds two meetings a year, in the form of open lectures on North American Waterways, at the Sutton College of Liberal Arts, SUTTON SURREY. The aim of these is two-fold. Firstly, to keep the "Flag Flying" and provide a regular series of lectures on American Waterway themes. Secondly, to provide a platform on which visiting speakers can talk about the American Waterways. Last Autumn Bev Morant gave an illustrated talk on the Commercial Waterways and Leisure Waterways of North America at a one-day Seminar, and earlier this year I gave a talk and slide show on the RIDEAU CANAL to commemorate the 150th Anniversary of its opening. In the Autumn (24th November 1982) I shall be giving a presentation on the WELLAND CANAL and our Candian Director Louis Cahill is providing me with some slides to supplement my own stocks. Further lectures will be organized in 1983.

One function of the ACS UK Section is to provide a contact point for visitors to England so that they may get the most out of their stay. Last year a two week tour was organized, which included a visit to the IWA National Rally at Leeds where the ACS members present were guests of honor. The IWA Chairman, John Haap, and President Sir Geoffrey DeFretas, joined together to link the IWA and the ACS by the exchange of tokens. The ACS were presented with a Burgee and this was brought back to America by ACS member Albert Celley and subsequently presented to ACS President Bill Shank. Such an action really identifies the aim of the UK Section, in helping the enthusiasts to unite.

The Year 1982 is Maritime Heritage Year in England. To help make ACS and Canal Society members more aware of the range of waterway facilities that can so easily be found in England, the ACS UK Director prepared a Slide/Tape package which is now available for members to use.

The UK Section is a small one, but it offers one of the vital links in ACS coverage of the Waterway scene. Its Director hopes that it provides a worthy range of facilities to forward the cause of ACS.

## Newark's Subway

On the Northeast Corridor, at Newark, New Jersey, is a delightful ride on the continent's best kept transit secret, the Newark City Subway.

Part of the 4.3-mile line is under downtown Newark, but most of it is an open cutting, the former bed of the Morris Canal, which once connected Newark with the Delaware Valley. Completion of the Lackawanna Railroad made the canal obsolete.

In 1929, a century after the first section opened, but long after commercial use had ceased, the canal was drained. A section of it was converted to a trolley line. The line opened in 1935; three years later it became Newark's only remaining trolley.

You'll need \$1.20 in exact change (60¢ twice) and about 25 minutes for a round trip.

Follow the "City Subway" signs to the basement of the Newark Amtrak station, where the subway begins. It's also where the line's fleet of 32-year-old-trolleys are stored and serviced.

From the Amtrak station the line goes west under the downtown. Wall tiles in the stations depict canal builders in the heroic fashion of the late 1920's.

Emerging from the subway, the line takes a northerly course. It bridges the Lackawanna Railroad (now reduced to a local commuter line), and in turn is bridged by Interstate 280. For the rest of the trip, the line follows the canal bed between Branch Brook Park on the right and Newark's predominantly Italian North Ward on the left.

(Submitted by Gary E. Heiland from Winter 1981-1982 Issue of train, transit, boat & bus.)

## CANAL CALENDAR

**June 26, 1982** — Freemansburg (Pennsylvania) Canal Festival. Contact Charlie Derr, 117 Main Street, Freemansburg, PA 18017.

**June 27, 1982** — Lehigh Canal Festival — Hugh Moore Park at Easton, PA

**July 3-5, 1982** — Steamship Historical Society meeting and tours on the S.S. Segwun, Gravenhurst, Ontario, Canada.

**July 8, 1982** — "Life on the Canals," Jim Lee, Morris Canal Author and Historian, Canal Museum, Hugh Moore Park, 8:00 p.m.

**July 9-10, 1982** — Canal Days, Canal Fulton, Ohio.

**July 10, 1982** — Raritan River Festival, New Brunswick, NJ.

**July 31, 1982** — A day-long tour of the Oswego Canal on the Emira II, sponsored by the Canal Museum, Syracuse, NY.

**July 31 - August 1, 1982** — Canal Days in Port Colborne, Ontario.

**August 20-22, 1982** — Coshocton (Ohio) Canal Festival, Coshocton and Roscoe Village, Ohio.

**August 28, 1982** — Canal Day in Wharton, NJ, Slide Lecture and guided tour of the Morris Canal, near Lock #2, John O'Toole.

**September 4-6, 1982** — Labor Day Weekend — Piqua Heritage Festival, Johnston Farm, Piqua, Ohio.

**September 1982** — Sandy and Beaver Canal Days, Magnolia, Ohio.

**October 2-3, 1982** — Scioto Valley Canal Society. Contact Truman C. Throckmorton, Corres. Secy., 1051 Galena Pike, West Portsmouth, Ohio 45662.

**October 8-10, 1982** — Canal Society of Ohio Fall Tour, Milan Canal and environs.