

AMERICAN CANALS

BULLETIN OF
THE AMERICAN CANAL SOCIETY

BULLETIN NUMBER 64

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

FEBRUARY 1988

PRESIDENT'S MESSAGE

Just for fun, I've been browsing through some of my favorite canal books — those which stir the blood, just thinking about them, such as L.T.C. Rolt's *Narrow Boat* (1944), which helped spark the English canal restoration movement; Banks & Schofield's *Brindley at West Earth Colliery*, which shows how exciting industrial archaeology can be; Coleman's *The Railway Navvies*, a study of those who built the railroads, using techniques developed on the canals; Jerome K. Jerome's *Three Men in a Boat (to say nothing of the dog)*, and its "sequel" a century later, Peter Lovesey's *Swing, Swing Together*, marvelous examples of fictional adventures on the Thames Navigation (both made into excellent TV shows as only the English can do it); and Harry Harrison's *A Transatlantic Tunnel, Hurrah*, not quite a canal story but a hilarious, well-researched and mind-stretching tale of transportation technology in a world where the Industrial Revolution was just a bit different from ours. There are more favorites than these, including down-to-earth historical works, but you get the idea.

I have my favorite American canal books too, starting with stories by Samuel Hopkins Adams and Walter D. Edmonds which bring the Erie Canal back to life. I could attempt a list, but why don't you send me your own list of America's very best canal books, divided into "most inspiring" "must-read" "best reference" (and what about "ought to be written") categories so we can put out a recommended reading list?

As the American Canal Society begins its 17th year of existence I want to thank all of you who have participated in our work, especially our Editor Bill Shank and our Secretary-Treasurer Charlie Derr, who have contributed more time and energy than we will ever know.

Have a great 1988!

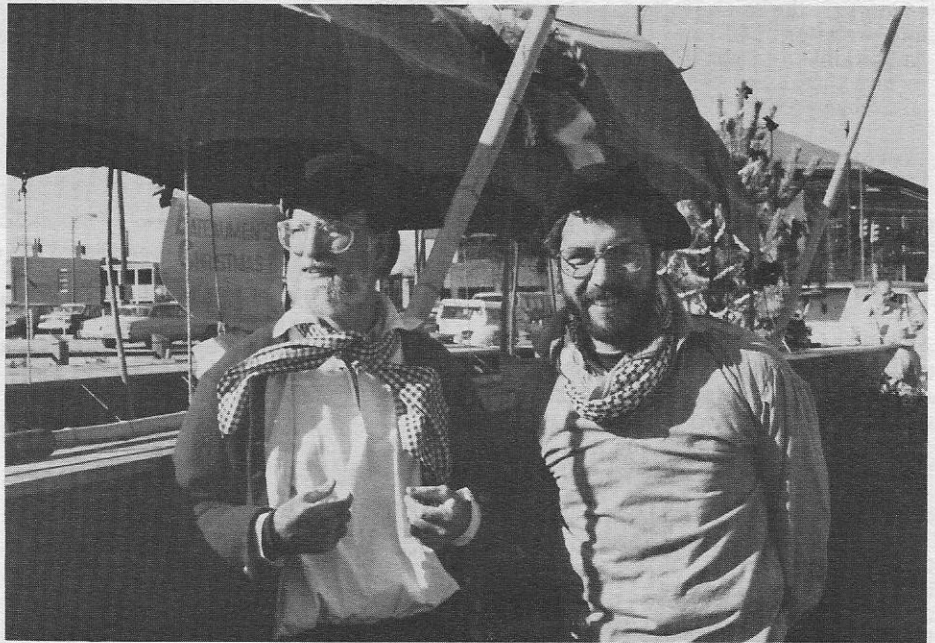
Bill Trout

CANAL INDEX HEAD

The American Canal Index was one of the earliest of the canal society's projects, begun 14 years ago by Peter Stott and continued by Terry Woods. The ambitious goal was to create an Index or information sheet on every one of America's navigation canals. At that time no one even had a good list of American canals.

Since then, hundreds of Canal Index sheets have been worked up but there is still much to do. It will take a long time, and it will require the help of our members to fill in the blank spots. We hope soon to put out our list of American canals, which also shows which of them need to be written up. Meanwhile, if you would like to help, write the new Canal Index Committee Chairman, William Dzombak, 621 Spring St., Latrobe, PA 15650.

STRANGER IN A STRANGE LAND



This winter, British canal buff Jeremy Frankel (right) took a few weeks off for a Grand Tour of America's canals. Here in Virginia, he and Bill Trout are in costume in front of the James River Batteau LORD CHESTERFIELD, where they joined Captain Paul Kreynus and crew for a voyage on a trailer down Broad Street during Richmond's Christmas parade. This was good practice for a wet run the next day, learning how to pole the batteau MINNIE LEE up the Rivanna River with Joe Ayers, founder of the James River Batteau Festival. While he was so close, Jeremy travelled next to America's southern canals, in Florida, California and Panama (Photo by George Rawls)

by Jeremy Frankel

As a visitor from England touring America and looking at your canals several curious aspects of the waterways have struck me. It would appear that any canal that exists today in a navigable state in no way resembles the one that was built 200 years ago. The New York State Barge Canal and the Chesapeake & Delaware are typical examples of this category. Otherwise any canal as originally built is generally in a derelict state today, apart from one or two very small sections that have been rewatered. Another facet that astonished me is that apparently there are no surviving examples of original boats, barges or batteaux afloat today.

With these facts in mind and comparing what I have seen with the English canal system it is apparent to me that the people of America, not just canal buffs are missing out on something very important.

The attitude that seems to prevail whereby derelict waterways are just left as they are to further deteriorate is more than a shame but a criminal negligence of one's history and heritage. Even if

a length of canal is incorporated into a park very little restoration is carried out apart from preventative measures to stabilise dangerous structures. My view is that where it is practical and economically viable, waterways should be restored to a navigable condition so that people can experience for themselves how boatmen navigated along canals and through the locks.

When canals were first constructed they were used purely for commerce moving raw materials like coal, wood, pig-iron and tobacco to towns and returning with manufactured goods. Canals were a watershed in man's history, be it in England, Europe or America changing the country from an agricultural based society through the industrial revolution to form the basis of the industrial society we now live in.

Canals were probably the last things to be built by man that was in harmony with nature. To see a working canal today in England one can see that the scale is human because man did not possess heavy construction equipment, they were all dug with picks, shovels and wheelbarrows.

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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 \$12.00. Individual copies may be purchased at \$3.00.

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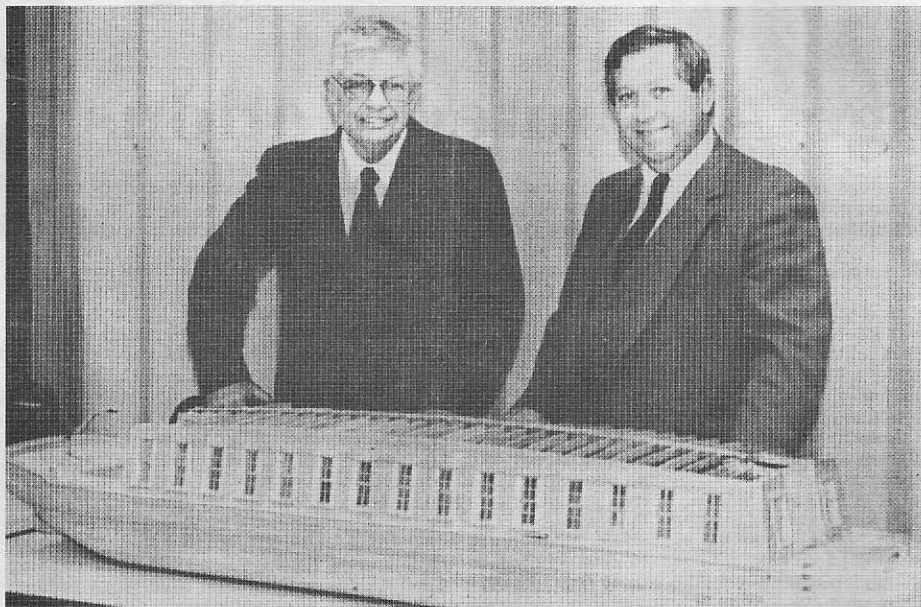
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BLACKSTONE RIVER CANAL BOAT



ACS Vice President Bill Gerber clipped the above photo from his local Milford Daily News for December 23rd, 1987. Robert E. Hager, left, of Syracuse, N.Y. and State Rep. Richard C. Moore, D-Uxbridge, admire the six-foot scale model of the Lady Carrington II, the river barge yet to be built that is expected to cruise the Blackstone River Canal in 1990. Hager drew up the plans for the barge, built the scale model and wrote its specifications. He is a photographer, artist and historian. (Daily News Photo by Shirley Cleaves)

NEW CANAL BOOKS

ACS Member Norton Clapp of Seattle Washington has sent us the Fall 1987 Issue of the **OREGON HISTORICAL QUARTERLY** in which appear several articles of interest to canalers: "Engineering the Cascades Canal and Locks, 1876-1896" by William F. Willingham; "Reminiscence, Hugh A Scott on Bonneville Dam

and the Boom Era"; and finally "Interview, Alice Tomkins Fee: Growing Up on the Cascade Locks 'Reservation' ". The articles are well written and well illustrated. It is suggested that ACS members write: The Editor, Oregon Historical Quarterly, 1230 S.W. Park Avenue, Portland, Oregon 97205.

99-YEAR OLD CANAL BOATMAN



At their January 1988 meeting at Allied Signal Auditorium in Morris Plains, New Jersey, the Canal Society of New Jersey gave special recognition to Dick Titus, and presented him with one of their new Canal Jackets. At ninety-nine years of age, Titus is one of the only surviving employees of the Morris Canal which once ran across central New Jersey, which shut down in 1924. "We are honoring him for being a canal boatman, and for just being alive," said Joe Hannon of the CSNJ. Dick Titus is in remarkable physical condition and came and went from the meeting on his own. In the photo are shown Joseph Hannon, who made the jacket presentation, Dick Titus, and Bob Geelan, CSNJ President. (Photo by Bruce Russell.)

THE OLD MIDDLESEX CANAL by Mary Stetson Clarke. This book is a 1987 reprint of the original, printed by Hilltop Press in 1974, with introduction by Arthur L. Eno, Jr. of Lowell, Mass., former President of the Middlesex Canal Association. The book is a 194-page paperback, well illustrated with photos and documents, as well as a guide to the route of the canal between Charlestown and Lowell. It is probably the most comprehensive history ever written about this very early, major canal in the northeast, which became the training ground and pattern for the Erie Canal. Republished by the Center for Canal History and Technology, Easton, Pa. Available for \$9.95 by writing Hugh Moore Park and Museums, 200 South Delaware Drive, P.O. Box 877, Easton, Pa. 18044. (Also available in Hardback for \$19.95)

HOMEFRONT: THE ERIE CANAL IN THE CIVIL WAR. This 52-page 8½" x 11" paperback, well illustrated with historic etchings, has just been published (1987) by the Erie Canal Museum, Syracuse, New York. The book describes in detail what the Erie Canal contributed to the War Effort and the impact which the War had on the growth and activity of the canal towns along the route of the Erie. Much tabular matter is included on shipments of wheat, corn, salt and other agricultural products during this period. The Canal's role in the Underground Railroad is discussed, as well as other related aspects of the War. Send \$11.95 (shipping charges included) to Erie Canal Museum, 318 Erie Boulevard East, Syracuse, New York, 13202.

SUSQUEHANNA AND TIDEWATER CANAL, Part I

By William H. Shank, P.E.

For years before the canal-building era began, the Susquehanna River had been the main avenue for trade between the central Pennsylvania counties and Baltimore. Except at times of the Spring freshets, the river has always been shallow and rocky and very difficult to navigate. Hence, most of the river shipping was downstream on rafts, arks or flatboats, which were usually dismantled at their destination. The only upstream navigation was via shallow scows or Durham-type boats which were poled by main-strength against the current.

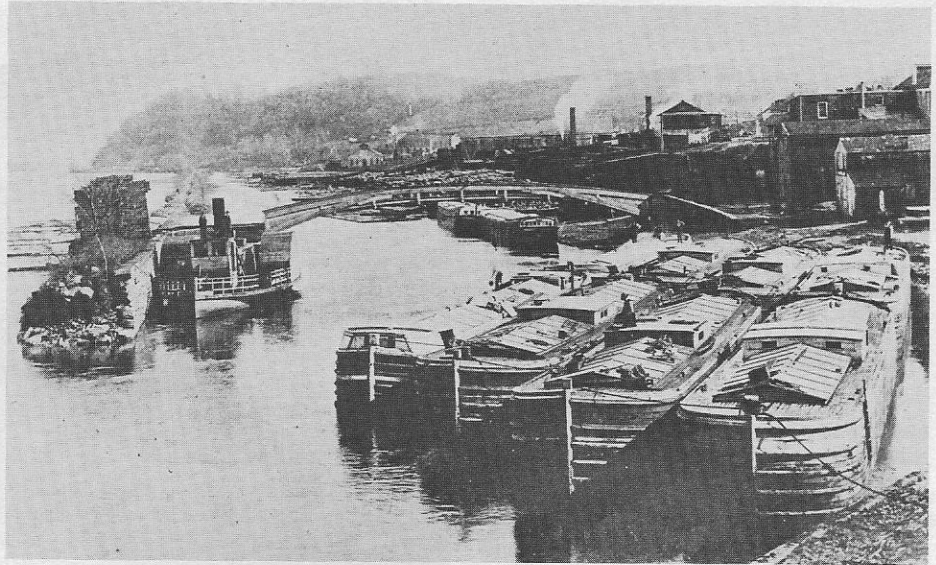
Navigation on the lower Susquehanna was improved somewhat when the one-mile Conewago Canal was completed in 1797 around the rapids at York Haven, Pennsylvania, but with nearly 300 feet drop in the river from this point to Chesapeake Bay, the downstream travel was still hazardous.

Port Deposit Canal

In 1793 a group of 45 Baltimore merchants were granted permission by the General Assembly of Maryland to build a canal on the east bank of the Susquehanna, from tidewater to Love Island, just below the Pennsylvania state line. The petitioners included Augustine Washington, half-brother of George Washington, and John Carroll, a signer of the Declaration of Independence.

The charter referred to this group as "The Proprietors of the Susquehanna Canal". It was the first undertaking of its kind in America. The canal was built, through Port Deposit to Love Island, as planned, and opened to traffic in 1803. It included nine locks (12' by 80') to overcome a 60-foot rise in elevation. The Governors of the states of Maryland and Pennsylvania were both present for opening ceremonies in 1802.

The canal was never too successful. The water in its channel was too swift and it "silted in" frequently. It was usually by-passed by rafts and arks headed downstream, hence not enough tolls were collected to maintain it properly. In 1817 it was sold, at a great loss, at public auction by the Sheriff



The Susquehanna and Tidewater Canal Basin at Wrightsville, Pa. about 1885, showing a number of empty canal freight boats tied up awaiting passage east and north. Shown on the left is the steam-tug "Columbia" which was used to tow the boats to and from Columbia on the opposite bank of the Susquehanna.

of Cecil County. The new owners tried to force its usage by building a wing-dam into the river, which only earned them the animosity of Pennsylvania traders.

Baltimore and Conowago Canal

In 1822 the Canal Commissioners of Maryland were asked to investigate a canal from above the falls at York Haven, Pennsylvania directly to the City of Baltimore. The Commission made a trip as far north as the Erie Canal (then building in New York State) where they talked to DeWitt Clinton, the promoter of the Erie, and hired James Geddes, Chief Engineer of the Champlain Canal, to run canal surveys in Pennsylvania and Maryland.

Geddes laid out a 92-1/2-mile canal route on the west bank of the Susquehanna, turning west at

Havre de Grace, and following an inland route from there to Baltimore. In 1824, the Maryland Legislature debated the possibility of making a Baltimore-Washington connection with the Chesapeake and Ohio Canal, then in the planning stages. They finally decided that a Baltimore to Central Pennsylvania Canal was more desirable, and authorized the Canal Commission to proceed with James Geddes' plan. However, the Commission were unable to obtain approval from the Pennsylvania Legislature to enter Pennsylvania, due to powerful opposition from Philadelphians, who wanted central Pennsylvania trade to come to their city — not Baltimore.

Conestoga Navigation Company

In 1828, the citizens of Lancaster, Pennsylvania desiring trade with Baltimore, opened a slack-water navigation system from their city to the Susquehanna along Conestoga Creek, in anticipation of the extension of the Port Deposit Canal northward.

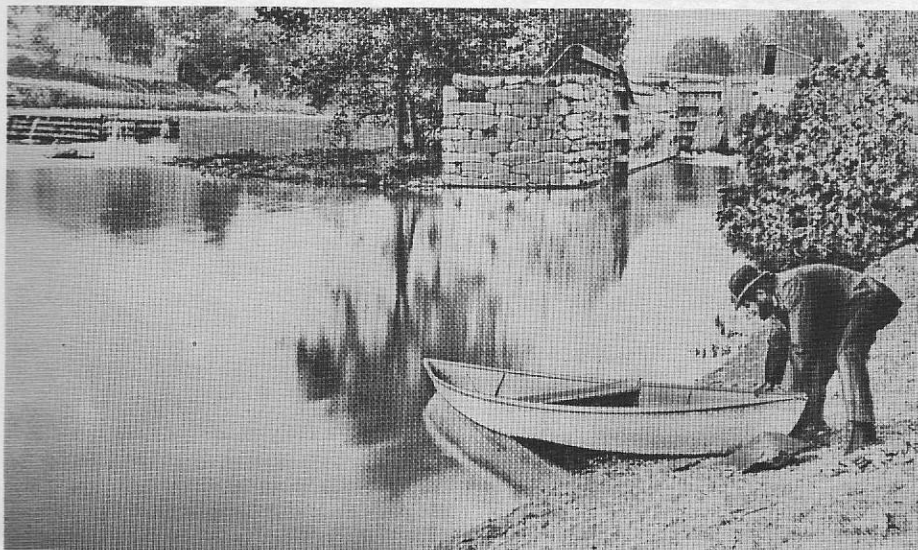
Codorus Navigation Company

Following the example of the Lancastrians, York, Pennsylvania also, in 1833, opened a canal-slackwater system to the Susquehanna River from that city, following the Codorus Creek.

Chesapeake and Delaware Canal

In 1829 this Philadelphia-sponsored canal was opened across the upper Delaware peninsula to connect Chesapeake Bay with the Delaware River. This was a compromise on the part of the Philadelphians which would permit them to do business with both the City of Baltimore and south-central Pennsylvania through a water connection on the lower Susquehanna.

By 1833 the Pennsylvania Main Line Canal System was in operation from Columbia, Pennsylvania — east to Philadelphia by railroad; north to upper, central Pennsylvania by canal; and west



A section of the Conestoga Navigation, which connected Lancaster, Pa. with the Susquehanna and Tidewater Canal. This was a slackwater operation, with a series of dams, bypassed by locks, providing deep water for the canal boats of the day. The derelict appearance of the lock in this photo indicates that it was made after navigation had ceased. The dams were maintained to provide water power for old mills along the route.

(Continued on Page Four)

SUSQUEHANNA AND TIDEWATER CANAL (Cont.)

(Continued from Page Three)

to Pittsburgh, via canal and railroad. Again, the Pennsylvania Legislature was approached by the Maryland Canal Commission with plans for a canal south from Columbia to meet the already existing Port Deposit Canal in Maryland. There was still opposition from certain elements in Philadelphia, but with the support of both York and Lancaster counties, a bill was passed by the Pennsylvania Legislature in April 15th, 1835, authorizing a company in Pennsylvania known as the "Susquehanna Canal Company."

Susquehanna and Tidewater Canal

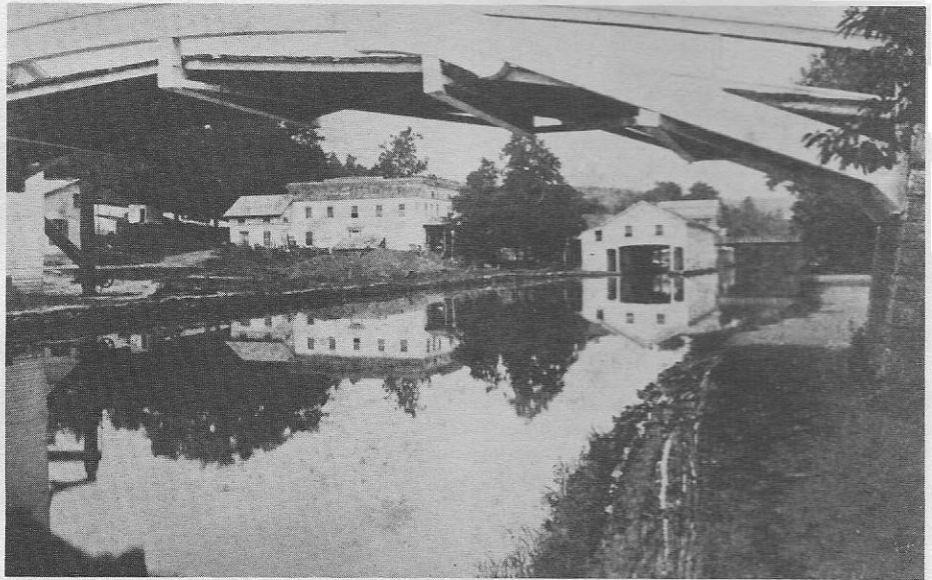
A "Tidewater Canal Company" had already been formed in Maryland for the same purpose, and the two companies were soon combined under the name "Susquehanna and Tidewater Canal Company," with the Pennsylvania Company acquiring the stock of the Maryland Company for more unified control. The new company also acquired the assets of the Conestoga Navigation.

Their next move was to acquire the Port Deposit Canal but negotiations indicated that the latter company was out "to make a killing", so the new company simply got permission from the two state legislatures to move their operation to the west bank of the river instead. The assets of the Port Deposit Canal later were transferred to the Susquehanna and Tidewater Canal Company at a fraction of the price originally asked.

Excavation began in 1835 with the northern terminus in Wrightsville, Pennsylvania and the southern terminus in Havre de Grace, Maryland. The new canal was 42.4 miles in length, with approximately two-thirds of the route in Pennsylvania and one-third in Maryland. To make connections with the Main Line Canal across the river in Columbia, the river was dammed at this point to create a slack-water pool and a double tow-path was added to the already existing, mile-long covered bridge between Columbia and Wrightsville so that the canal boats could be towed between the two canal basins, both east and west, without interference or delay. At the southern end of the route, an outlet lock was also provided at Lapidum to connect with Port Deposit on the east bank of the Susquehanna.

Twenty-nine locks were built to overcome a change in elevation of 231 feet between Wrightsville and Havre de Grace (see table),

Lock No.	Mileage	Lift (Ft.)	Comments
Basin	0.0	0.0	Wrightsville Dam Elev. 230.69'
1	0.8	0.0	Guard lock at west end of dam
2	5.5	10.0	Lower end of "Long Level"
3 *	7.5	7.75	Below Green Branch
4 *	7.8	8.16	Old town of Bridgeville
5 *	9.0	7.51	1/4 mile below Cuffs Run
6 *	10.0	8.67	
7	11.5	7.6	3/4 mile below Safe Harbor Dam
8	12.0	8.15	1/2 mile above Shenk's Ferry
-	14.3	0.0	Weigh-Lock at York Furnace
9	15.6	7.25	Opposite Duncan's Island
10 *	16.0	7.85	
11 *	18.5	9.0	Just above Holtwood Dam
12	19.4	8.8	Now located in Lock 12 Park
13	19.8	8.8	Slab Tavern
14	19.95	8.97	McCall's Hotel
15	21.0	8.8	Hotel
16	21.9	2.15	Downstream side of Muddy Creek
17	22.0	8.70	1 mile above Peach Bottom
18 *	26.1	10.95	
19 *	27.5	9.7	
-	27.8	-	Maryland-Pennsylvania line
1 TWC *	28.6	8.4	
2 TWC *	30.0	7.7	
3 TWC *	31.5	9.85	Old Conowingo village
4 TWC *	32.5	9.95	
5 TWC *	33.4	9.00	
6 TWC *	34.3	9.25	
7 TWC	36.3	11.35	Just below Conowingo Dam
-	37.4	6.0	Opens into Deer Creek
8 TWC	38.7	10.25	Guard Lock off Deer Creek
9 TWC	42.4	5.45	Also Port Deposit Outlet Lock Havre de Grace Tidewater Outlet



The Weigh-Lock at York Furnace, where all freight boats had to "weigh-in" to determine the toll they were to be charged for their cargo.

Avoiding the now obvious error of earlier canals, such as the Union Canal, in building their locks too narrow and too small, locks on the S. & T. were built 17 feet wide, with a distance between upstream and downstream gates of 170 feet, allowing tandem boats from the Pennsylvania canals of up to 300 tons capacity per pair to pass the locks easily. The canal channel was designed 50 feet wide at water level by six feet deep. There was a weigh-lock for freight boats (the primary vessels using the canal) at York Furnace at which tolls were charged to help maintain the canal fixtures and reimburse the stockholders. At the half-way point on each lock a third set of lock gates were originally planned to save water in locking through single boats, but since most of the boats were tandem, there is little evidence that the middle gates were ever used.

The locks were numbered south from Wrightsville with the Pennsylvania lock series ending at the state line and the Maryland series (designated as TWC for "Tide-Water Canal") starting at the state line. The asterisks designate those locks now under water in the artificial lakes formed by the three power dams built in the Twentieth Century. There were a total of four dams feeding the canal, five culverts, eighteen overhead bridges, thirty-three waste-weirs and six aqueducts. A long reach of the canal, unbroken by locks for five miles below Wrightsville, became known as the "Five-Mile Long Level" and to this day retains the name "Long Level" for that area, although the origin of the name is almost forgotten.

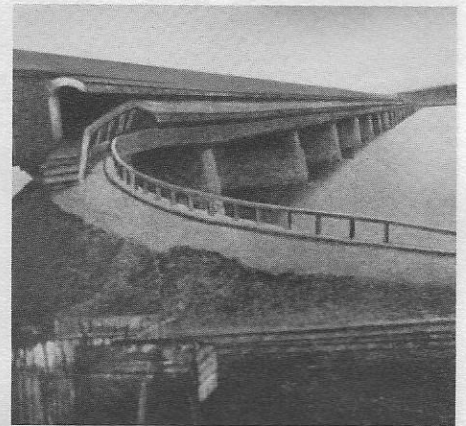
The Way it Was

It will help to understand some of the details of operation if we read the following instructions. These are copied directly from an 1864 "pass-bill" which every canal boat captain was required to read as he brought his vessel into any entrance point along the canal:
"GENERAL REGULATIONS TO BE OBSERVED ON THE SUEQUEHANNA AND TIDE WATER CANALS:
 "1. All boats using the canal must have their names painted on the stern or other conspicuous place.

"2. The master or owner of the boat shall in all cases at the first collector's office, or lock, which she may desire to pass, deliver to the collector or lock-keeper, an account in writing of the lading of the boat, designating the different articles, and the quantity or number of each, so arranged that the amount of tolls shall be easily calculated. There shall also be specified on the account the number of passengers, and the places from and to which they are respectively to be carried.

"3. If the master or owner of any boat shall be detected in making any willful misrepresentation of the weight or quantity of his cargo, he shall be liable to pay treble the ordinary rate of toll on the entire cargo of such boat.

"4. The tolls shall in all cases be paid at the first collector's office, or designated lock, passed by any vessel, raft or other craft, and upon payment



The world's longest, covered wooden bridge crossing the Susquehanna River between Wrightsville and Columbia. Note the double-deck towing paths for the mules to tow their canal boats in opposite directions without interference to each other. This bridge was burned during the Civil War to keep Confederate troops out of Lancaster County, after which the tug "Columbia" was used to tow canal boats across the river.

thereof, the master shall receive a pass-bill or clearance, on which shall be noted the amount of tolls paid, and the date of entering.

"5. The pass-bill or clearance shall be exhibited to any lock-keeper (before passing his lock) who may require it and shall be given up at the last lock through which the vessel shall pass, or wherever that lock-keeper shall designate. Vessels exhibiting no pass-bill or clearance shall not be allowed to proceed.

"6. Every boat, raft or other craft, passing on the canal, shall at all times during the night carry a conspicuous light in her bow or forward end; and no boat, raft or other craft shall be permitted to pass any lock in the night time without such light.

"7. No setting pole or shaft pointed with iron shall be permitted to be used on any of the locks, bridges or other wood work of the canal.

"8. All boats and horses ascending the canal are entitled to the towing path — and all boats and horses descending, the horses to stop, and drop their towingline, so that the ascending horses and boats may freely pass over.

"9. Each boat must have a horn, which must be sounded when it arrives within a quarter of a mile of any lock intended to be passed.

"10. No boat shall be suffered to lay to or stop within two hundred feet of any lock, nor on the towing path, nor shall any two boats be suffered to lie along side of each other, except within a basin, and every boat coming to within a basin shall be securely fastened by a bow and stern line. Nor shall any boat load or unload on the towing path, or place stones or other obstructions thereon.

Boats Passing Each Other

"11. Boats or other crafts travelling the canal, if one overtakes another and wishes to pass, the forward one shall turn their horses and craft outward from the towing path, drop their towing lines, and permit the faster horses and boat or craft to pass.

"12. If a boat is unnecessarily delayed in passing any lock, the master is requested to inform the superintendent of the cause and time of detention.

"13. Every boat in passing a lock shall fasten a bow and stern line so as to prevent it from striking against the gates, and if any damage happens the gates or locks from negligence, the master or owner of the boat shall be liable for the damages, and subject to the penalties of the law.

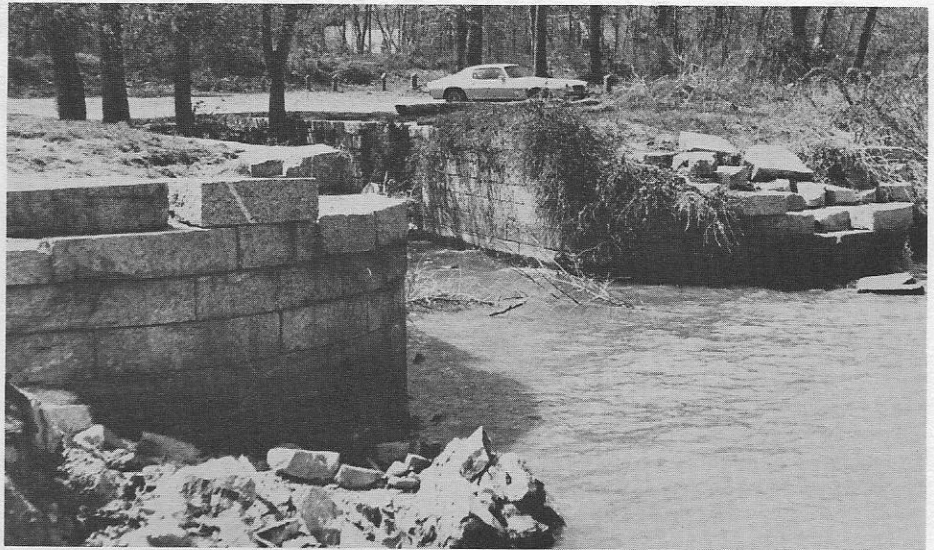
"14. No horses or other animals shall be permitted to use or travel on the towing path, except such as are engaged in the business of towing, or in the employ of the company.

"15. No boat, vessel, or craft of any kind shall lie in the basin at Havre de Grace, within two hundred feet of the head of the outlet lock, and not more than two vessels shall lie abreast for the next one hundred feet above; and the passage to the lock shall at all times be kept open, so that vessels and boats may freely pass in and out of the basin. And the master of any boat or vessel, which shall be suffered to obstruct the said passages, shall be prosecuted according to law.

"16. No person shall use the wharves or grounds of the company, for loading or unloading without permission from the company's officer and paying such compensation as may be stipulated.

"17. Every vessel in the canal, its harbors and basins, shall have some person on board to have charge of her, who shall place her in such position or make such change of her position as the officer of the company shall require; and if he shall refuse or neglect so to do, when required, or if no person be on board, such officer may himself cut or cast off her fasts, and change her position.

"18. The officers and agents of the company are required to enforce obedience to the foregoing



Present-day appearance of the Port Deposit Outlet Lock on the S. & T. Canal, just below Lock Eight at the southern end of the Susquehanna State Park. This is where the Pennsylvania Canal Boats described in the article were "shut out" in 1894.

regulations — and no one is allowed to interfere with them in the performance of their duties. And they are required to prosecute according to law any person who shall willfully or negligently injure the canal, or any of the works or property of the company.

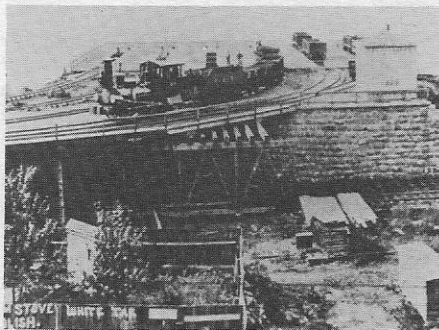
"19. Boats arriving from Philadelphia or Baltimore will enter the lock at Havre de Grace according to the Regulations to be found in the collectors office.

"20. No ascending or descending boat shall enter a lock after having been notified to the contrary by the lock-keeper or other agent of the company.

"21. For the violation of any of the foregoing rules, a fine not exceeding twenty dollars (except as otherwise above mentioned) will be imposed."

Tandem Boats

In the latter days of operation, pairs of boats, hitched together in tandem had become almost standard equipment on the S. & T., permitting one team of mules to tow two boat-loads simultaneously. Some enterprising captains had developed a unique chain-linkage steering device between their two boats, so that the rear boat became the "rudder" for the front one. Often a pilothouse with a steering wheel activating the chains was installed at the front of the second boat. A separate rudder was still available at the rear of the rig.



These are the coal-car dumps in Columbia, Pa. where the Reading Railroad unloaded its coal-hopper-cars into waiting canal boats at river level below. The boats were then towed across the river to the S. & T. Canal at Wrightsville where they traveled to Havre de Grace and Baltimore.

The first boat traversed the finished canal in the fall of 1839, but due to operating difficulties and faulty workmanship the new canal was not officially opened until late 1840. For the first time there was now an all-water connection for the thriving lumber industry of Williamsport, the anthracite coal district at Wilkes-Barre, and other industries in central Pennsylvania to ship their products directly by boat to Baltimore, Philadelphia and even New York City.

Heavy traffic on the new Susquehanna and Tidewater Canal began almost immediately. The important junction towns of Columbia, Wrightsville and Havre de Grace grew and prospered. The headquarters office of the S. & T. Canal at Chestnut and Front Streets in Wrightsville (in a building still standing) announced that tickets were on sale in that office for London, England. In addition to the important, state-owned Columbia and Philadelphia Railroad which delivered goods and passengers in Columbia; the Reading Railroad extended its lines to Columbia where it constructed an overhead coal hopper-car dump to unload coal directly into waiting canal boats at river level to be towed to the Wrightsville Canal Basin and on to Baltimore.

Early Prosperity

A few statistics may indicate the prosperity which the S. & T. Canal enjoyed for the next thirty years. In the early years of operation up-stream traffic nearly equaled down-stream traffic. In 1843 groceries topped the list of products bound up-river, followed by iron products, coffee, bricks and dry goods. Also in 1843 coal was the most important down-river product, followed by sawed lumber, bacon, tobacco and whiskey. Both the ports of Baltimore and Philadelphia provided steam-tug towing service for clusters of canal boats arriving at the Havre de Grace river docks. In 1850 a total of 1640 canal boats were towed to Baltimore and 2560 to Philadelphia (via the C. & D. Canal.) In 1855 Baltimore towed 2642 boats to their harbor, with 3147 canal boats to Philadelphia. Some of the latter went on to New York City.

In 1864 tolls collected at the York Furnace Weigh-Lock reached a peak of \$278,344 on a capital investment of approximately five million dollars. However, railroad competition began to take business away from canals everywhere, and by 1870 traffic on the S. & T. began a sharp decline.

(Concluded on Page Six)

S. & T. Canal



Heavily-loaded freight boats on the S. & T. Canal approaching Lock Number One, a mile south of Wrightsville, circa 1890.

(Concluded from Page Five)

In 1872 the owners sold their holdings to the Reading Railroad, which had become one of the most important users of the canal, to extend their lines into Baltimore. The Reading continued to operate the S. & T. for the next two decades to deliver coal to Baltimore. However, a disastrous flood in May of 1894 caused such damage to the locks, dams and towpath, that the Reading Railroad refused to invest further money in repairs and decided, in 1895, to shut the canal down, for good. Twenty-eight pairs of Pennsylvania Canal boats were caught outside the canal at Lapidum.

The following is the interesting story, as told by Captain Frank Reif, of how he finally brought his boat home:

"On a Saturday night we towed to Port Deposit, and were landed across the river at Bell's Ferry on Sunday morning. The outlet lock was a single lock and was owned privately by Jacob Tome, a wealthy business man of Port Deposit. Upon landing at this outlet lock we learned that there was a padlock and a chain on the lower gates of the Tidewater Company's double locks nearby and there was no water in the level. We took the teams out of the boats, made ready to drive them home, and leave the boats to their fate. However, we were told by the other boatmen not to be too hasty. They said there was a stone house a small distance below the locks where tea was sold over the bar at ten cents per drink. It was the custom of the lock tender to loaf at this tea room and the boat men were liberal in buying him drinks. Somehow, that evening the lock tender fell asleep from over imbibing Oolong and when he and the residents of the little town awoke the following morning they were quite surprised at seeing five pairs of boats in the canal, no water in the level and the lock and chain on the gates unbroken. How was it done? That was a mystery thus explained:

"Two men had gone up to the next lock above the foot of Deer Creek, opened the wicket and left sufficient water from the creek to float the boats into the level after letting five pairs through the locks. When the Reading Company learned that the water was drawn off again and that there were five pairs of boats in the canal they were furious, but thinking it over decided to make repairs to the torn canal to guarantee a 2½" draft, sufficient to float the light boats. This they did. About the time the canal was in readiness for us to pass homeward a man had made a contract to drag a catch of logs into the canal that had come down the river on the flood and he soon had 8,000 or perhaps 10,000 logs afloat in the shallow ditch.

"TRIALS AND TRIBULATIONS"

The following item was clipped by ACS Vice President Bill McKelvey from Supreme Court of Pennsylvania proceedings dated April 10th, 1826, at Philadelphia. It is entitled: "Shrunk against the President, Managers and Company of the Schuylkill Navigation Company":

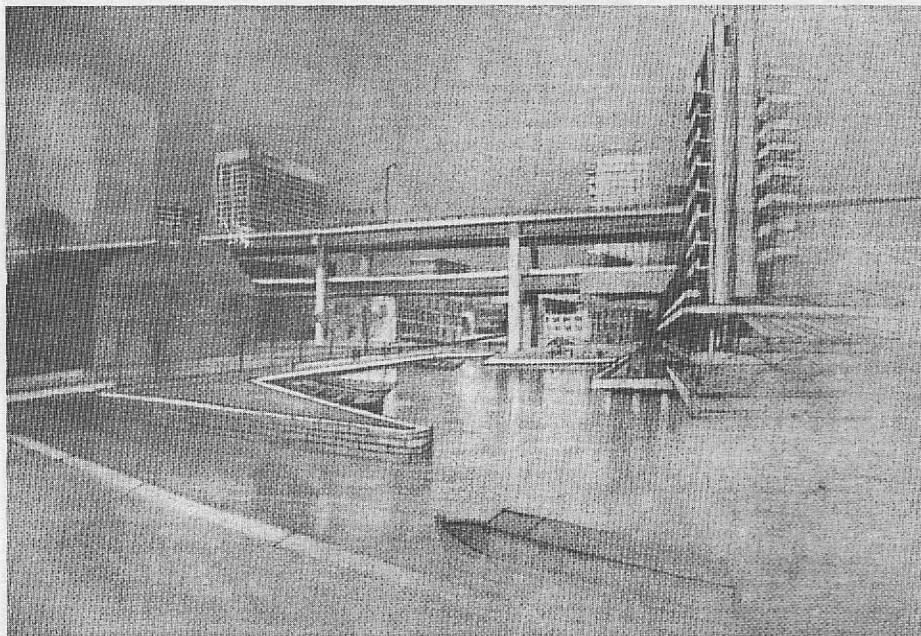
The plaintiff in error, *Godfrey Shrunk*, having instituted proceedings in the Court of Common Pleas of Philadelphia county against the defendants in error, under the act of assembly of the 8th of March, 1815, to recover damages for an alleged injury to his fishery in the river *Schuylkill*, it was agreed that judgment be entered for the defendants, in the court below, that a writ of error be taken out, and that the following case be considered as a special verdict:

The rivers of *Pennsylvania* are not subject to the common law rule, that all fresh water rivers, in which the tide does not ebb and flow, belong to

the owners of the soil adjacent, so that the owners of one side have, of common right, the property of the soil, and consequently the right of fishing, *usque ad filum medium aquae*, and the owners of the other side the rights of soil and fishing *ad filum aquae* on the other side, and that he who owns both sides, is the owner of the whole river, and has the exclusive right of fishing according to the extent of his shores.

The owner of land fronting upon the river *Schuylkill*, above tide waters, who had the exclusive right of drawing seines on his own land, is not entitled to damages, under the act of the 8th of March, 1815, incorporating the President, Managers, and Company of the *Schuylkill* Navigation Company, for an injury sustained in consequence of the erection of a dam across the river by the said company, by reason of which, shad, herring, and other fish were prevented from passing up the river.

Kanawha Canal Extended



Architectural rendering by Carlton Abbott and Partners showing the projected plan for extending the existing Kanawha Canal segments to make a continuous water-park system in downtown Richmond. The view is drawn looking northwest from between 13th and 14th Streets toward Shockoe Slip. (Contributed by Bill Trout.)

The five boat captains and their crews lost their religion in this predicament, and who would not? There was scarcely water enough to float the boats, and then to have the channel clogged with timber!! We were nine days in progressing eleven miles. To overcome the handicap we put three, sometimes four, teams (16 mules) on one pair of boats in an effort to open the way through the log jam. It was some experience! At times we were obliged to cut the logs apart. Finally we did get through the canal and when the last boats passed the inlet locks we broke the balance beams off the four gates, and that put the big period to the end of the Tidewater Navigation."

TO BE CONTINUED. The second section of this article will show what happened to the S. & T. Canal when the power dams were built on the lower Susquehanna—also restoration activities now taking place at Havre de Grace. Editor.

New York State & Federal Partnership Achieved

The future of the New York State Canal System looks brighter all the time. With the approval of the 1988 budget by President Reagan, the \$10 million appropriation for the Erie Canal System was signed into law. Hats off to our congressional delegation, especially to Senators Moynahan and D'Amato, for making this giant step a reality. Credit also goes to all the friends of the canal, many of them BARGE members, who took the time to write letters to the legislators in support of this action. (From "BARGE", for February 1988, newsletter of the Bi-Recreational Association for the Restoration of the Great Erie)

RONALD REAGAN'S CANAL

By Bill Trout

Ronald Reagan, our 40th President, was born too late to invent a device for lifting steamboats off sandbars, like Abraham Lincoln, or to lead a mule on the towpath like James Garfield. Instead, he did the next best thing, which was to be born and grow up on, and in, a canal, the Rock River Feeder of the Hennepin Canal in Illinois. His mother was probably baptized in it; he was born on its banks, and made it his swimming hole; and he spent his summers as a lifeguard saving bathers from it, whether they liked it or not. In fact, in *Reagan's America*, Garry Wills takes quite a few pages to describe how Reagan's early environment was shaped by Big Government's development of the upper Mississippi valley's navigation system.

I was introduced to all this by two ACS members. Virginia canalboat modeler Theodore Haxall showed me his postcard with a 1907 photo of the first excursion boat on the Hennepin Canal at Tampico, Illinois. On the back, the text proudly pointed out that Tampico was also famous as the birthplace of Ronald Reagan. Then George Rawls showed me Garry Wills' book.

According to Wills, Reagan was born in Tampico because the Hennepin Canal was there. His parents, Jack and Nelle Reagan, moved to Tampico in 1906 because it was a boom town living off the prosperity of a major federal government project, one of the last government "frontiers," the building of the Hennepin Canal, which opened the next year, in 1907. It was used by the local Church of Christ for baptizing by total immersion, so his mother, Nelle, was probably dipped in the canal for her baptism on Easter Sunday in 1910. Ronald Wilson Reagan was born the next year, not far from the canal. Unfortunately for canal history he was probably not baptized in it, but in a church in Dixon when he was eleven.

In his autobiography, *Where's the rest of me?*, Reagan fondly recalled his life in Tampico while he lived there at age eight after having returned from several moves around Illinois:

"My existence turned into one of those rare Huck Finn-Tom Sawyer idylls. There were woods and mysteries, life and death among the small creatures, hunting and fishing; those were the days when I learned the real riches of rags. Out of town, one way, there was a clear-bottomed creek; the other way, there was a deep and treacherous canal we always used for swimming. It was dangerous to those who could not handle themselves in water; several times I can recall the hushed mood of the town when they brought a small covered burden home from the canal."

By learning to swim in a canal, Reagan shared the danger and challenge with generations of boys fortunate enough to have a canal for a swimming hole. It was good training for his teen-age years in Dixon, Illinois, where his family moved next. Here for seven summers he was the lifeguard in Lowell Park, which had a beach on the bank of the Rock River upstream of the Hennepin Canal feeder dam. The Rock River, like the Hennepin Canal, could be a treacherous place for swimmers, primarily because of the operation of the feeder dam and lock downstream. Every time he saved someone, he cut a notch in a log. As Reagan recalled,

"That river, which has been called 'The Hudson of the West,' became a great part of my life. In the winter, I loved ice skating on it and in the summer I enjoyed canoeing and swimming there. I hiked along its shores, climbed its limestone bluffs,



Postcard photo of the first excursion boat on the Hennepin Canal, on November 18, 1907, at Tampico, Illinois, the birthplace of Ronald Reagan. This was Reagan's swimming hole, and probably the site of his mother's baptism. (From the collection of Theodore Haxall)

and went tramping around, exploring the wooded country nearby

"During my career at the park, I saved seventy-seven people Not many thanked me, much less gave me a reward They felt insulted. The only money I ever got was ten dollars for diving for an old man's upper plate that he lost going down our slide.

"I got to recognize that people hate to be saved: almost every one of them later sought me out and angrily denounced me for dragging them to shore

"As a matter of fact, the water in the Rock River off Lowell Park was a fairly difficult spot to swim. There was a dam downstream which, when the sluices were opened, gave the ordinarily slow current a quicker tempo and deeper thrust. The bottom sloped swiftly into deep water not too far from the edge. An additional hazard was the other bank, about six hundred feet away: swimming across was a challenge — only, once started, you had

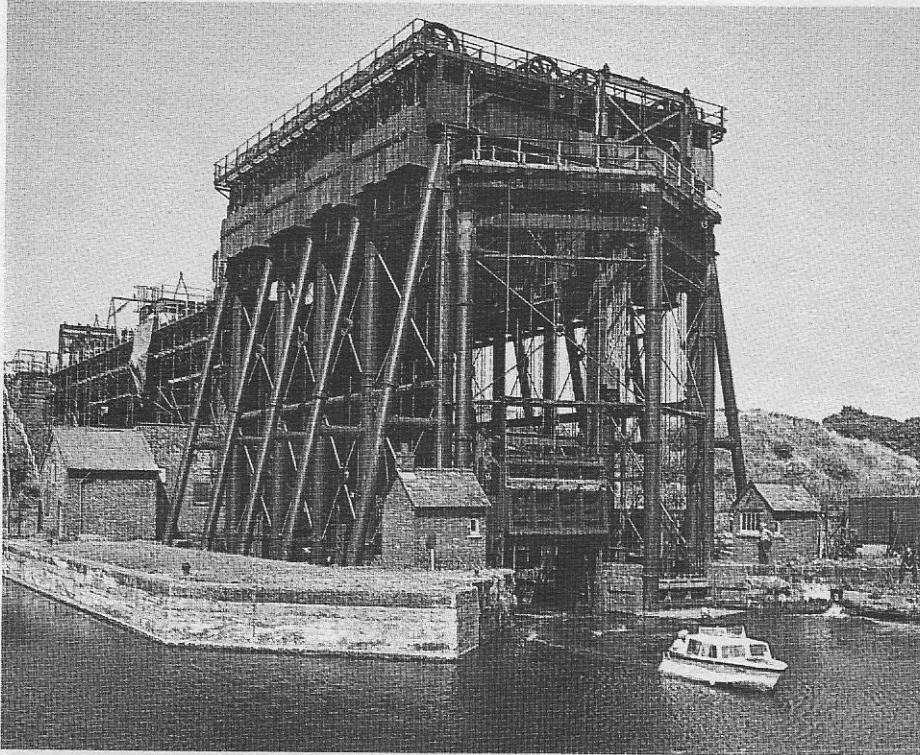
to go all the way, or else."

Ronald Reagan has come a long way from his early days on the Hennepin Canal. It's too bad he was never in a canal movie. America missed the boat by concentrating her imagination on the wild west rather than the wild canal era; we could have had some great films such as "Genesee Valley Days," "Bedtime for De Witt," and "Hellcats of the C&O"! But it is fitting that it was President Ronald Reagan who in August, 1984, signed a pioneering bill to create the country's first National Heritage Corridor, along the route of the Illinois and Michigan Canal. Together with the Hennepin Canal Parkway State Park, this has created a unique canal park crossing the entire state of Illinois. (For more on the Hennepin Canal see Mary M. Yeater's articles in THE BEST OF AMERICAN CANALS, Part 1., write for a flyer from the Hennepin Canal Parkway, R.R. 1, Sheffield, IL 61361, and join the Illinois Canal Society, 1109 Garfield St., Lockport, IL 60441.)



During their Fall Field Trip headquartered in Kingston, Ontario, fifty members of the Canadian Canal Society made one of their stops at the historic Wolfe Island Canal which provided a direct commercial link across Wolfe Island between Kingston and Cape Vincent in New York State. Restoration of the canal is under study. Here, John Burtniak, program chairman, C.C.S., points out the route to a group of the visitors, left to right, Howard Card, Syracuse; Madeleine Duquemin, St. Catharines; Councillor Donald MacDonald, bridge committee chairman, Frontenac Island County; Wm. MacLean, Toronto, president, C.C.S.; Colin Duquemin, past president, C.C.S.; and Mr. Burtniak.

ANDERTON LIFT WINS A REPRIEVE



The famous Anderton Lift, which for over 100 years has been providing a direct connection between the Trent and Mersey Canal and the Weaver River, nearly 60 feet below. A small boat is shown emerging from one of the caissons.

By Bruce J. Russell

One of the principal highlights of England's inland waterway system is the 113 year old Anderton Lift, an imposing example of late 19th and early 20th Century industrial engineering which permits canal boats to descend from the TRENT & MERSEY CANAL to the River WEAVER, a drop of nearly 60 feet. This massive structure, located in Cheshire and built in 1875 under the direction of EDWARD LEADER WILLIAMS, was designed to permit commercial traffic to flow between the man made waterway on the upper level, and the natural waterway beneath which had been canalized several years earlier. Its construction during an era when the English canals were still an integral part of that island's transportation matrix meant that boats would not have to spend an inordinate amount of time ascending and descending a traditional "staircase" flight of locks. Such staircases, such as those at Bingley and Hatton, were the usual method 18th and 19th Century canal builders employed to gain elevation at a particular locale. Unfortunately it required a great deal of time to negotiate them, not to mention the physical effort involved in opening and closing the many lock gates of the individual chambers. In addition they consumed considerable quantities of water, a factor which often became significant during periods of draught. Reasons such as these were the motivating force behind the design and building of mechanical lifting devices whose purpose was to permit canal boats to overcome differences in elevation quickly and easily. As 19th Century engineers began to take advantage of new developments in the field of hydraulics, steam, and metallurgy they were able to devise new and innovative solutions to problems which a few years earlier might have seemed hopelessly perplexing and perhaps even insurmountable.

Although by the early 1870s the extensive canal and inland waterway system of England and Wales had been eclipsed by the railways, it was nevertheless able to retain significant amounts of commercial traffic. This was especially true in the case of bulk commodities where time of delivery was not critical and where prices were negotiable. For example between 1825 and 1865 a considerable amount of salt was being produced at various locations along the TRENT & MERSEY CANAL, and the major markets for it were situated in the villages, towns, and cities on the River WEAVER. At a place called Anderton the two waterways were in close proximity to one another, but at different elevations. Consequently in order for trans shipment to occur the salt and other products had to be physically unloaded from the traditional 7 foot wide, 70 foot long narrowboats of the Trent & MERSEY CANAL, and then dropped down specially designed chutes which emptied into similar vessels on the river. Items which could not be handled in this way had to be placed on small tramcars or wagons and moved from the higher to the lower point. In situations where goods had to be transferred in the opposite direction, from the River Weaver to the TRENT & MERSEY, a great deal of effort had to be expended in order to overcome nearly 60 feet of gradient in a short distance. Thus the situation at Anderton necessitated a practical as well as an energy efficient solution.

After several years of studying the schemes proposed by several of England's most gifted engineers, the one put forth by WILLIAMS was deemed the most workable from a number of standpoints. What he had in mind was a vertical lift to raise and lower canal boats floating in caissons or water-tight chambers. Each caisson would be capable of accommodating two 70 foot, 60 ton narrow boats of the type used on virtually

all of Britain's canals, and which in the latter portion of the 1800s was still considered economical in terms of carrying capacity. Construction began in 1873, and the builder was the Emmerson, Murgatroyd Company which specialized in both wrought as well as cast iron. Because electricity had not yet been developed to the point where it could be utilized to power motors, the mechanism used at Anderton was hydraulic. The two tanks, (each measuring 75 feet by 15 feet by 5 feet) counterbalanced one another and were supported on huge hydraulic rams or pistons which descended into deep pits below ground. By removing some water from the lower tank or caisson it was made lighter and was thus forced upward as the heavier tank descended. Once the lower tank had reached the upper level and vice versa the same procedure was repeated. Water from the TRENT & MERSEY CANAL was first admitted into the upper tank containing one or two narrowboats. Then a measured quantity of water was allowed to exit from the lower caisson. The difference in weight resulted in a piston effect occurring which caused one tank to rise while the other simultaneously fell for a total distance of about 60 feet. By using this hydraulic technique the need to construct a flight of locks was avoided. Furthermore for 33 years this novel system of hydraulically operated counterbalanced caissons permitted the expeditious flow of waterborn commerce between the TRENT & MERSEY CANAL and the canalized RIVER WEAVER. Williams achieved considerable fame for his solution to the problem at Anderton, and for decades what came to be known as the Anderton Lift attracted tourists and engineering students from all parts of the civilized world. This brilliant engineer went on to design the well-known Barton Swing Aqueduct near Manchester which likewise made use of a hydraulic mechanism.

It would be safe to say that had the Anderton Lift not been built, the trade on the two important waterways it serves would have withered and died by the turn of the century, if not earlier. Trans shipment of cargos is such an uneconomical and labor intensive activity that railroads would have been substituted for the boats. Instead the lion's share of the commercial traffic on these canals was retained for an additional 40 or 50 years, and was only lost in the post World War II period when much of England's transport began to be moved by trucks.

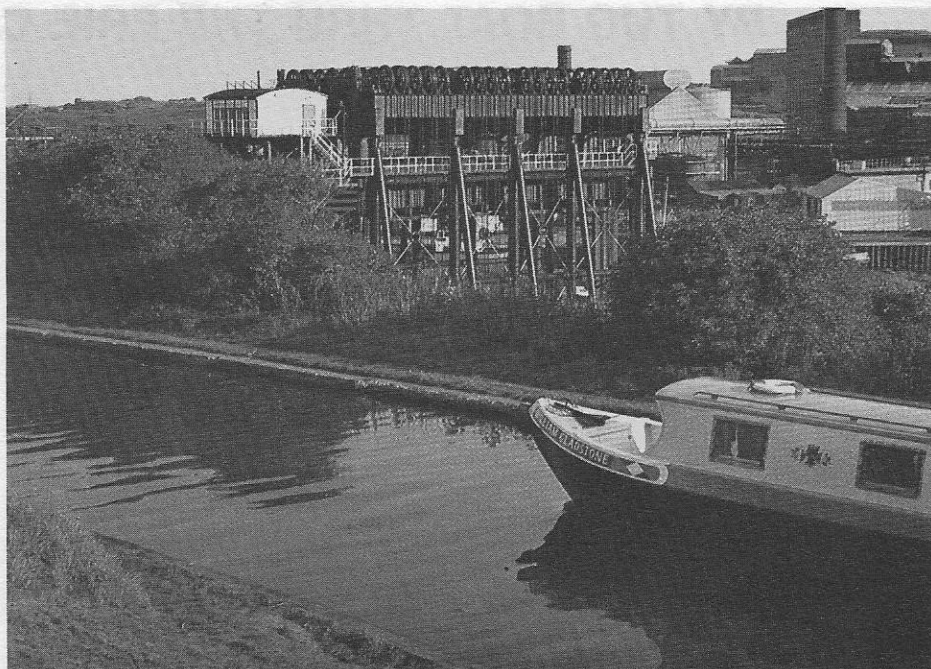
In 1875 era Anderton Lift also served as an inspiration for similar structures throughout the industrialized world. For example in 1888 construction began on a series of 4 boat lifts at Houdeng, Belgium (For a detailed description of these refer to the Feb., 1987 edition of AMERICAN CANALS), in 1899 at Henricenburg in Germany, and in 1905 at Peterborough and Kirkfield in Ontario, Canada. Prior to designing their own projects, the Belgian, German, and Canadian engineers invariably visited Anderton to observe first hand how Williams had gone about building his famous boat lift. Watching the ease at which the twin caissons moved up and down no doubt convinced them to adopt this form of technology rather than building an inclined marine railway as exemplified by the planes on New Jersey's MORRIS CANAL, or perhaps a set of traditional canal locks.

In 1908 the machinery at Anderton was in need of extensive overhaul, but by then improvements in electrical power generation dictated that this form of propulsion be substituted for the original hydraulic pistons. The 1875 structure was partially dismantled and substantially rebuilt utilizing heavier construction materials such as steel rather than

cast iron. As a consequence of this major reconstruction the 1908 version stood in sharp contrast to its 19th Century predecessor in terms of appearance. In place of the original hydraulically operated counterbalanced cassions were two new troughs. These utilized electric motors and were independent of one another. Hence one could be shut down for repairs or during periods of low traffic density while its companion remained in use. This feature naturally contributed to the flexibility of the lift and also reduced unnecessary wear and tear. In effect what now exists at the Anderton site are two identical lifts situated side by side. Each consists of a tank of water counterbalanced by a series of large cast iron weights which can be seen hanging along each side of the enormous structure. These tanks and counterweights are connected by thick wire ropes passing over giant pulleys on top of the lift.

Each tank has a watertight Guillotine gate at either end. When the water levels inside and outside a tank are the same the gate is raised to let boats inside or out. When closed the gates seal the tank which can then be raised or lowered the 60 feet between the water levels of the TRENT & MERSEY CANAL and the RIVER WEAVER. Although each tank weights 252 tons the counterbalancing mechanism allows it to be moved by a 30 hp electric motor which slowly turns the pulleys by a complex series of very large cogs. The amount of time required to raise or lower a canal boat is less than 7 minutes. So successful was the reconstructed, electrically powered Anderton Lift that many of its design features were incorporated in a boat lift built in 1932 in Niederfinow in Germany.

From 1908 until 1958 traffic of all sorts moved up and down the lift at Anderton, and operating personnel were assigned to it 7 days per week. In 1949 the BRITISH WATERWAYS BOARD was created to take over most of Britain's canals and navigable rivers, and the Anderton Lift was included in the scheme. During the years it has received periodic maintenance designed to keep it in a functioning state, but no major overhaul was done because of the cost factors involved. In the early 1980s some serious problems developed such as cracking caused by metal fatigue, and the lift was closed partly on the grounds that it was no longer safe and was in danger of collapsing. (This latter point may have been somewhat overstated.) Since commercial traffic no longer exists on the TRENT & MERSEY CANAL, repair of the Anderton Lift cannot be justified on strict economic grounds. Nevertheless the recreational canal boat industry has continued to wage a lobbying effort to get it



A traditional narrow boat on the Trent and Mersey Canal approaching the Anderton Lift at the upper level.

back into operation. Their argument is that without it one possible routing for those on canal or "waterways" holidays is now effectively blocked. (ie you can't get from the TRENT & MERSEY down to the WEAVER and vice versa.)

Furthermore the TRENT & MERSEY CANAL SOCIETY, an exceptionally vocal and well organized group, has been campaigning to get the Anderton Lift back in service and issues bumper stickers, decals, pennants, and other promotional items with the motto "Save the Anderton Lift". During their 1987 canal tour of Britain members of the Canal Society of New Jersey visited the closed Anderton Lift and spoke with many of these individuals. All were impressed with their enthusiasm as well as sense of absolute dedication to a worthy cause.

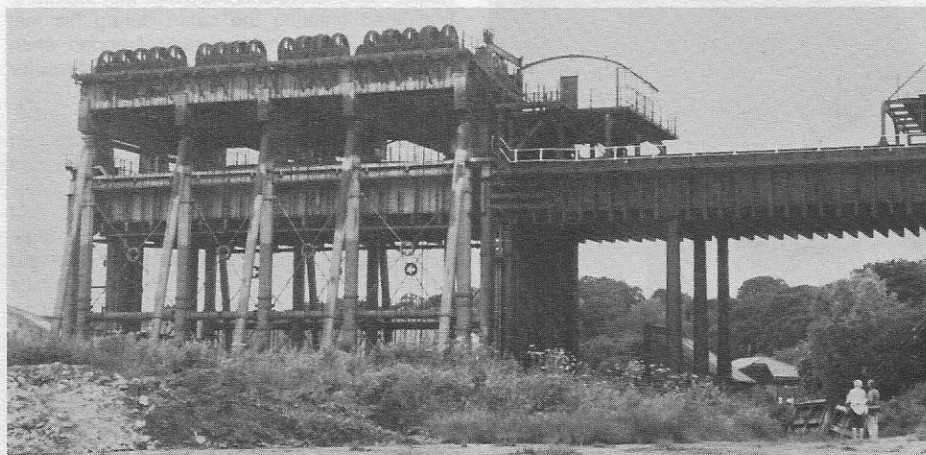
Their hard work has paid off! The January-February 1988 issue of *WATERWAYS NEWS*, the official publication of the British Waterways Board, shows the Anderton Lift being dismantled for restoration. A 100,000 pound contract has been awarded ME Mechanical Handling Limited for this dismantling operation, which began last November, and was completed in January of

1988. British Waterways Engineers Bill Morgan and Ron Townsend are already coordinating phase one of the restoration work. Plans include development of the area around the lift as a tourist attraction.

By December '87 all of the operating machinery and counterbalance weight had been removed to storage adjacent to the Lift. Bill Morgan said the equipment was in surprisingly good condition with hardly any wear on the various gear wheel bearings and shafts. Indeed, original machinery marks could be seen as if the shafts had just been made. All items have had a unique identity code fitted on them so they can be reassembled in the correct relationship. Almost every day of the dismantling revealed some new hidden insight as to the way the original designers undertook a particular course of action. Bill says: "All of us privileged to work on this contract are full of admiration for the ingenuity of our predecessor engineers who had to work with many more limitations than we do."

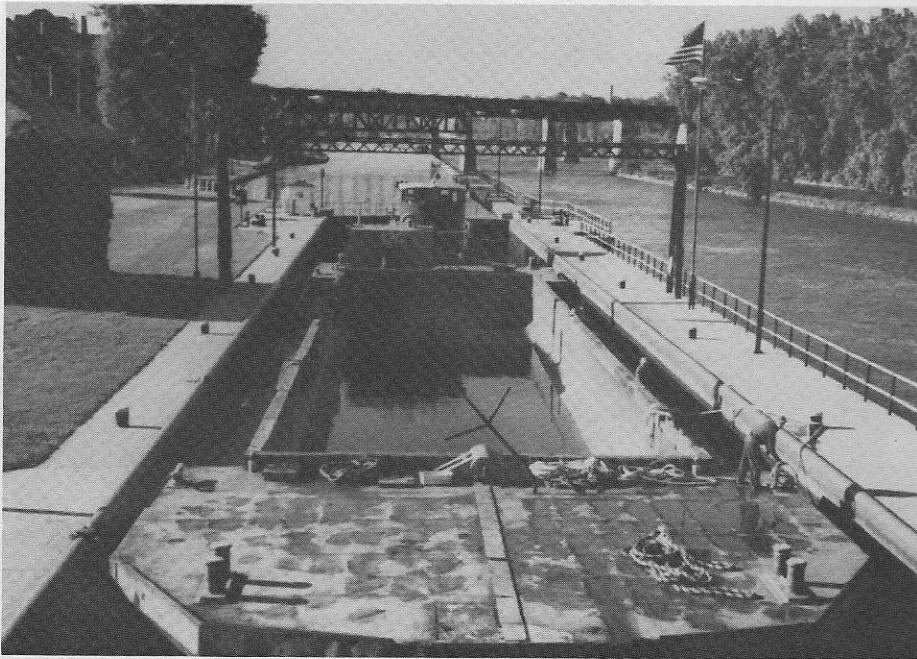
A NEW CANAL MUSEUM

A new Canal Museum is in the making, in the centre of Smith Falls, mid-point of the Rideau Canal. It is to be the Rideau Canal Museum. Its exhibits will concentrate on memorabilia related to all aspects of the Canal and its history, while the Headquarters of the Rideau Canal staff, under its superintendent, will be housed in a building that will be part of the Museum complex. The old Woods Mill Building, originally constructed in 1840 and restored in the 1880's, and a later associated stone building, still stand quite close to the locks at Smith Falls. It is planned to restore them and convert them into the Museum complex. A Rideau Canal Museum Corp. has been established, with G. Hamilton Southam of Ottawa as its Chairman. An appeal for funds will shortly be launched. It is hoped to have the Museum ready for opening in May 1989. (From "Canals Canada", Newsletter of the Canadian Canal Society.)



View of the Anderton Lift taken from the side. Canal boats enter the lift on the short bridge on the right. Once into the lift they are lowered down to the level of the River Weaver. The lift was originally built in the 1870s, but substantially rebuilt about 1907. (Bruce Russell photo June 28, 1987)

BY TUG-BOAT THRU THE ERIE CANAL (Part I)



The Tug and scow are shown here in a lock on the Oswego Canal. Note that the scow clears the walls of the lock by only a few inches on each side, and the end clearance between lock gates is measured in inches also. Careful manoeuvring is required both in and out of the lock.

By Gerard Chapman

It is three o'clock and I'm busy at my job when the telephone rings. It is Jeff Blinn in the New York offices of the Moran Towing and Transportation Company, calling to ask whether I can be in Troy N.Y., at three o'clock in the morning to board one of his tugs on the Barge Canal. It is a trip I have been seeking for three or four years, and I assure him that, yes, I can and shall be there.

Many times, in traveling on the New York State Thruway, had I seen the tranquil reaches of the Western, or Erie, Division of the New York State Barge Canal; and those who go north from Albany see occasional stretches of the Champlain Division. But so seldom is any traffic seen on these waterways that some believe them to be abandoned. Not so; about three million tons of cargo are carried yearly, with petroleum and its products predominating. (At its peak, the Erie Canal carried more than six million tons of grain, lumber, stone and other commodities annually, in the 1860's and 1870's.) I had read Walter D. Edmonds' several books about the old Erie, and had a collection of pamphlets, maps and circulars from the Department of Transportation of the State of New York about the canal, and had long wanted to see what life on it was like, as viewed from a working tug, and here at last was my wish come true.

It was rainy and foggy on the 70-mile drive but I arrived at Troy Lock and Dam — Federal Lock No. 1 — on the Hudson River above Albany, in good time to board the *Margot Moran* at 3:15 a.m. It was down-bound and soon reached "Troy Wall" to pick up Dunbar & Sullivan scow No. 120 moored there. I learned that it was one of two chartered to the Great Lakes Dredge & Dock Company and being moved through the canal from New York Harbor to Charlotte on Lake Ontario. The two scows had been towed up the Hudson River to Troy and No. 120 moored there while No. 121 had been pushed to a moorage just above

Lock 16 near St. Johnsville in the Mohawk Valley. They were being leap-frogged through the canal to Oswego.

Expertly maneuvering his vessel, Mate Clayton Gillikin in the pilot house tied onto scow No. 120, lashing it to the *Margot Moran's* bow with steel cables taut as fiddle strings. Casting the scow loose from its mooring against the Wall, he turned about and started back up the Hudson, passing again through Troy Lock about 4:30 a.m., as dawn was breaking. A light rain was speckling the glassy-calm surface of the river as we reached Waterford. Here, where the Mohawk River enters the Hudson, the Erie Division of the Barge Canal branches to the west, while the Champlain Division continues north.



Captain Chester E. MacDonald, Master of the Tug "Margot Moran".

It was the first trip this vessel had made through the canal in almost two years and Gillikin observed wryly that the canal was getting to be just like the Thruway, with a sign at the junction reading: "Erie Canal, Syracuse and Buffalo; Champlain Canal, Whitehall and Lake Champlain."

Before we could enter the first lock on the Erie — Lock No. 2 — we had to wait while the tug *Evening Light* cleared it in downbound passage. We then entered the lock to begin the steep climb through five locks in close succession to ascend 169 feet around the cataracts over which the Mohawk tumbles into the Hudson. They are situated on only two miles of canal and provide a spectacular entry to the waterway to the west. Above Lock 6, at 184 feet above sea level, the canal extends west for 10 level miles, and we can pause to contemplate this great inland waterway.

Designated No. 1 on the Erie Division, the lock at Troy, at the head of tidewater, is controlled by the Corps of Engineers, U.S. Army, but all other locks on the system (except one near Buffalo) are under the jurisdiction of the Department of Transportation of the State of New York, which also is responsible for its motor roads.

The *Morgot Moran* is only one of many tugboats operated by the Moran Towing and Transportation Company, with headquarters in New York but operating in several ports on the East, Gulf and West coasts of the United States. Most of the time they are engaged in the prosaic business of docking or undocking large ships, and towing scows or barges in the bays, rivers and canals carrying our water-borne transportation. Sometimes they are called upon to rescue vessels in distress upon the high seas, victims of storms or mechanical failure, but tales of their dogged heroism cannot be told here.

Adapted for canal work, tugs such as ours have retractable pilot houses, and it was startling when we encountered the first low bridge, to have the pilot house suddenly drop 10 or a dozen feet so that we could pass under it.

During our transit of the five stair-step locks, as we climbed out of the Hudson Valley into the valley of the Mohawk, the watch changed at 6 a.m. The mate relinquished the controls to the captain, and the rest of the crew changed also, as those who had been sleeping relieved those on duty. All except the cook work six hours, then are off six hours. Assigned to share a cabin with the mate, I avoided entering the cabin during his rest periods, and it was not until early afternoon, when he was again on duty, that I lay down at last for a little rest.

In little more than an hour we reached Lock 7, and with eleven miles to go, it was the better part of two hours to Lock 8, as the tug with its burden goes between seven and eight miles per hour. Capt. Chester E. MacDonald was in the pilot house. A veteran of many years on Moran tugs, he wore an air of quiet, competent authority and the assurance of being completely in control of the operation. Of medium height and build, with white, close-cropped hair, he was affable and responded to my questions with stories of his years of experience.

The rain had stopped, the sun was shining, and there was no wind. As the miles unwind, the skipper reminisced about life on the canal in the past years, telling how the towboat companies used to vie to be the first through the canal in the Spring. "I remember one time, about 20 years ago," he recalled, "when several of us were waiting below

a lock which was clogged with the accumulated debris of winter: rubbish, limbs of trees, logs. The engineers were having a hell of a time clearing it. I knew the lockmaster and offered to push the stuff out of his lock if he could manage to admit my tug to it. He agreed readily, since it would get them out of a tough spot. In two or three careful nudges, I pushed the solid jumble of debris up out of the lock and over toward the dam, where it was carried away by the current. And, of course, that put me first through the lock, ahead of all the others, and I kept ahead all the way up!"

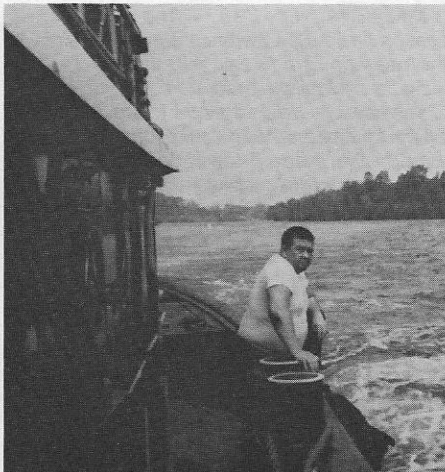
Passing through a lock involves the cooperation of deck hands and pilot. Upon nearing a lock, the pilot cuts his engine and drifts to a very slow approach. If the gate is closed, he sounds three short blasts on his whistle to request passage. If the gate is open and the signal green, he enters the lock. Meanwhile, when the deckhands hear the engine go down, they drop whatever they may be doing and scramble over the bow onto the scow, to stand one on each side at its bow, to signal the pilot to go right or left to center it in the lock. For there is only a foot and half difference between the width of the scow and that of the lock — a tight fit for a float so long and heavy. When in the lock, they cast their heavy lines onto snubbing posts to prevent the float's drifting into the gates.

The gate behind the two is closed. If the lockage is from a lower level to a higher, water is admitted to the lock from the canal above, filling it to the higher level. As the float rises, the deckhands cast their lines onto successively higher snubbing posts set into the walls. If the lockage is from a higher level to a lower, the reverse procedure is followed. As the float descends, the deckhands flip their mooses from the snubbing posts, but when the line fails to come free, one of them has to climb the ladder set into the wall of the lock to free it, and climb down again. Sometimes small boys watching the operation do it for them.

At the new level the lines are cast off, the float moves slowly into the canal and conversations with those standing on the walls fade out.

At the first lock on the Erie, we obtained Clearance No. 90, and in each subsequent lockage that number was given to the locktender for his records.

Water for filling the locks comes out of the canal, which in turn is supplied either by intersecting streams or by aqueduct from the distant Catskill Mountains. To conserve water, small boats are required to wait for scheduled lockages, but when we ran light (without a scow) several of them entered the locks with us to get through sooner.



Frank Schoonmaker, The Cook.



The Tug "Margo Moran" in one of the Locks on the Erie Canal.

Between lockages, the deckhands have other duties: they pass and tighten the cables used to bind the scow to the bow of the tug; at night, on the forward end of the scow they place red and green signal lamps, and a white one in the center for the guidance of the pilot in steering; and they do maintenance work during the long runs between locks.

As the hours wore on and we ascended the canalized Mohawk River, only one problem arose: the engineers had lowered the level above Lock 8 to work on its dam, and the pool between it and Lock 9 was shallow, requiring a slower rate of travel. And since our scow drew 11 feet of water, we barely scraped over the sill at lock 9.

For the greater part of its way to Rome, the Erie Division follows the Mohawk River in its meanderings and the scenery is varied and beautiful. Its aspect is mostly pastoral, with an occasional city or village for a change; fields of growing crops alternate with pastureland dotted with grazing cattle. Islands dot the course of the river, with buoys to guide the navigator through the deepened channel. On the upbound run, white buoys bearing odd numbers are on the left, with even-numbered red buoys on the right. When night falls, photocells turn on their lights, which flash briefly at intervals, white or red. One's location at any moment can be determined by reference to Lakes Survey Chart No. 180, which depicts every buoy or stationary light by number. Frequently visible on one side of the canal or the other, is the Thruway, its speeding traffic in sharp contrast to our plodding progress.

At noon the Mate reappeared, refreshed, and boomed jovially, "Okay, Skip, I'll take her now. Anything new?"

"No," answered MacDonald, "just be sure to let the office know where we are late in the afternoon," and with that he descended for his rest.

He was referring to the requirement that the Moran headquarters in New York be informed at all times where their many vessels are. During his watch the Captain had used the radiotelephone to call the dispatcher there, Mike Bodlovich. In his turn, the Mate used a lockside telephone to call in.

Sometimes, on another channel, the radio blares as a pilot somewhere on the canal talks with another or to canal personnel.

Late in the day, after locking through No. 16, we passed scow No. 121 at its mooring in the basin and went on.

(To be Continued)

Stranger In A Strange Land

(Concluded from Page One)

They are a monument to the early engineers, surveyors and navies — the navigators who toiled, sweated and died building embankments, cutting aqueducts, tunnels and locks. That their waterways can still be seen today albeit derelict is a tribute to their skill.

Although the political and financial systems of our countries are different I'm sure a way can be found to combine the abilities of state government, business corporations and the enthusiasm of canal societies to restore some waterways. The expenditure on restoration can be partially offset in the long term by trip-boats, stocking the canal for fishing and charging for rod-licenses. If the length restored is long enough one can rent boats out for personal use.

Promoting the waterway as part of one's heritage will boost the tourist business along the route — shops, restaurants, hotels and so on. By using them and not fencing them off or metaphorically putting them in glass cases, one can, to borrow the slogan employed by the New York State Department of Transportation to publicise the Erie Barge Canal "experience the legend".

(Jeremy Frankel is a leader of the Waterway Recovery Group, which restores canals in Britain. He insists that although he was a "Stranger in a Strange Land" during his extensive tour of American Canals, he was not as strange as the stranger in Robert Heinlein's book. His address is 83 Edgwarebury Lane, Edgware, Middlesex, London HA8 8LZ, England.)

CANAL GHOSTS

Yes, Bill Trout, there are other canal ghosts or ghost stories. One that I am familiar with is THE GHOST OF HERKIMER LOCK (on the Erie Canal) from the book CANAL WATER AND WHISKEY by Marvin A. Rapp, copyright 1965 by Twayne Publishers, Inc. 31 Union Square West, New York 3, N.Y. This book is, of course, out of print. Marvin Rapp was one of the organizers of the CSNYS, one of the pioneer canal societies.

Gerald Abendschein
Waterport, New York

“Canal Levels” (Engineering Notes)

“Navigable Canals,” say the textbooks on Canal Engineering, “consist of level stretches of channel, communication between which is effected by some artificial means.”

That sounds simple enough. An engineer would lay out a level stretch of canal, and when the adjacent countryside rose so high above the bottom of the channel that excavation became prohibitively expensive, another level channel would be initiated and the two connected by a lock or inclined plane. A comparison of the total lock lifts and differences in elevations of the end points of several U.S. canals, however, shows a marked discrepancy. It began to look as if at least some of the ‘levels’ on a number of the nation’s early navigable canals were not at all level. Initial research by members of the A.C.S. Engineering Design Committee has brought to light a number of ‘sloped levels’ on at least five of the early canals.

The channel of the western-most 50 miles of the original Erie Canal, from Buffalo to Lockport, was constructed with a slope of 1” to the mile. The engineers were concerned that feeder streams along that section of canal would be unable to supply sufficient water for heavy traffic so they required the channel to be sloped to more effectively use Lake Erie as a feeder.

Engineers for the Eastern Division of Pennsylvania’s Main Line Canal were concerned about having enough water before the line of their canal picked up the waters of the Juniata River. The channel of the canal between Harrisburg and the Juniata River was therefore directed to be constructed three feet wider at the water-line and bottom, six inches deeper, and to have a descent of one inch and a half to the mile.

On the Wyoming Division of Pennsylvania’s North Branch canal, the discrepancy between total lifts of locks and the difference in elevation of the end points almost disappears when a ‘slope’ of 1” per mile is allowed for the ‘levels’.

Though primarily a ploy to insure a steady flow of water for problem sections, some engineers adopted the ‘sloping level’ for most or all of their lines. The channel of the Whitewater canal in Indiana was constructed with a slope of 1” per mile. The original specifications for the Ohio & Erie Canal called for a 1” slope per mile and there is some physical evidence that the Miami Extension in Ohio, begun some six years later than the Ohio & Erie, was built to the same specifications.

The 1” per mile slope, not too steep to cause a great current for upstream craft to surmount, but steep enough to cause an abundant supply of water to flow, appears to be the more common ‘level slope’. However at least fourteen miles of the Delaware and Raritan Canal in New Jersey, from Bull’s Island (about eight miles above Trenton) to the Delaware River, were built with a slope of two inches per mile.

Using ‘sloped levels’ added another factor when calculating water requirements, and it made wasteways at the foot of each of these levels above a lock, a necessity, but both these subjects will be covered in subsequent “Engineering Notes”.

In the meantime, it would be useful to Canal Buffs and Historians to know just where ‘sloped levels’ were used and how much slope there was. So if anyone knows of additional ‘sloped levels’ on U.S. canals, or where the ‘level’ levels were, we’d like to know of it so that information may be recorded and made available to A.C.S. members.

Terry K. Woods, Chairman
ACS Eng. Design Committee

CANAL CALENDAR

March 18, 1988 — Regular Meeting of the Canal Society of New Jersey, Allied Signal Auditorium, Morris Township, N.J. “Canalling in England” by Capt. Bill McKelvey, who conducted the 1987 Tour for 39 CSNJ members.
March 26, 1988 — Seventh Annual Canal History Symposium at Lafayette College, Easton, Pa. Write Canal Museum, P.O. Box 877, Easton, PA 18044.

April 22-23, 1988 — Canal Society of Ohio Spring Tour of the Ohio and Erie Canal, north of Newark. Headquarters, Best Western Motel in Newark, Ohio. Write: John Droege, 2937 Neil Ave., Columbus, OH 43202.

April 23, 1988 — Spring Tour of the Pennsylvania Canal Society in the Harrisburg, PA. area. Contact Bob Keintz for full details at R.D. #2, Box 15, Anthony Road, East Berlin, PA 17316.

April 30, 1988 — Canal Society of New York State Spring Tour of the Genesee Valley Canal, Rochester to Dansville. Contact Emily Madden 5847 Decker Road, Livonia, NY 14487.

May 7-8, 1988 — Spring Field Trip of the Canal Society of New Jersey along the Champlain Canal in upper New York State, Waterford to Whitehall. Bus-Tour Guide, John Hulchanski. Contact: Bill Moss, P.O. Box 127, Fanwood, NJ 07023.

May 13-15, 1988 — Annual Meeting, exhibits, tours and lectures by the Virginia Canals and Navigations Society at Fredericksburg. Contact Fredericksburg Department of Tourism, 706 Caroline Street, Fredericksburg, VA 22401.

May 14, 1988 — Spring Field Trip of the Canadian Canal Society. Port Colbourne, Port Maitland, Dunnville, Port Dover and Brantford with dinner on Big Creek Boat Ferry. Contact: R.N. Voaden, CCS, P.O. Box 1652, St. Catharines, Ontario L2R 7K1.

May 19-21, 1988 — Annual Meeting of the Society for Industrial Archeology, Wheeling, West Virginia. Tours and lectures. Contact: Emory L. Kemp, West Virginia University, Morgantown WV 26506.

June 11-18, 1988 — Third Annual James River Batteau Festival, Lynchburg to Richmond. Write: Joe Ayers, P.O. Box 790, Columbia VA 23038.

September 12-15, 1988 — National Conference on Historic Canals, sponsored by Illinois and Michigan Canal National Heritage Corridor Commission, at Morris, Illinois. Write Robert F. Holmes, I. & M. National Heritage Corridor, 30 North Bluff, Joliet, Illinois 60435.

MEMBERSHIP

With this issue of AMERICAN CANALS we enclose a small but well-written brochure, produced by ACS President Bill Trout. This can serve as a reminder to all of us of the high objectives of our Society, and can also be used in obtaining new members. Please forward your copy to a friend who shares your interest in canals. Additional copies are available from ACS Secretary-Treasurer Charlie Derr, 117 Main Street, Freemansburg, PA 18017. (Editor)

STEAM ON CANALS

The following item was discovered by ACS Director Gibson Hobbs in the “Richmond Whig” for August 8, 1871.

A most novel feature of transportation on the river Elbe, calculated to arouse the attention of every observant traveler, is the method of propulsion employed on the steam tow-boats of that celebrated stream. The freight boats that are there employed are usually either sloops or schooners, with their masts so arranged as to be readily lowered in passing the many bridges that span the river at Dresden and other cities on the shores. On their return trips, up the Elbe, the narrowness of the river and the tortuousness of the channel render sails useless, and steam is ever necessarily employed, and it is to the method of its application here that I would draw your attention.

From six to a dozen of these sailing vessels are towed up the Elbe by one steam towboat, that is furnished with neither a paddle nor a screw. An immense chain, some seventy miles long, with its upper end fastened to the bottom of the river channel, many miles above Dresden, and its lower end secured in the same way, many miles below the city, passes through a roller or pulley at the bow of the towboat or tug, is then wrapped around a large drum near the middle of the deck of the tug, and then passes back and through another roller or pulley at the stern of the tug, and thence into the water.

The steam power is applied to this drum, and the revolution of this simply winds the tug up stream, with all the boats that are temporarily attached to it; and all of this is accomplished with satisfactory speed, and without any commotion of the water of the river. As the current is considerable on the Elbe, and boats readily float down stream with the current, the towboats are here only used in towing up stream, and only one chain is employed; but, in a canal, on which vessels would have to be towed each way, two chains would be required, and this is the only difficulty in the way of the complete success of this method that I can imagine, even if there be this one.

Seaway Closes

The following item was clipped by Walter Meseck from a December 1987 Newspaper. It indicates that the Seaway has recovered from its difficulties of several years ago.

MASSENA, N.Y. (AP) — The 29th shipping season on the St. Lawrence Seaway ended with the passage of a Greek ship through the U.S. locks, a spokesman said.

The season, which opened March 31, included the transport of 40 million metric tons of cargo through the seaway, the highest total in three years, said seaway spokesman Dennis Deuschl Monday.

The seaway closing is dictated each year by weather conditions.

“This is one of the later closings ... We stayed open extra long this year to accommodate this special ship,” Deuschl said.

The vessel, Capetan Yiannis, was carrying Food for Peace cargo bound for Tanzania and Ethiopia, Deuschel said.

The ship had been damaged in Milwaukee, Wis., during a Dec. 15 snowstorm and had to be pulled by three tugboats through the seaway locks.