

# A LONG THE TOWPATH

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## BEFORE SNOW FALLS?

After a series of developments, the C & O Canal Association in late June heard predictions that "before the snow falls this fall" Congress will have passed the bill to make the 184-mile water-way the Chesapeake and Ohio Banal National Historical Park.

The Association was told, however, tha "as bright as the prospects are--there's still a great deal of work to be done before the bill can besigned into law by President Nixon."

This warning was the central theme of the Association's extraordinary meeting. Featured speaker at the meeting was Representative John P. Saylor of Pennsylvania, ranking minority member of the House Interior and Insular Affairs Committee which is expected to consider Canal legislation within the next two months. Other speakers included Congressmen Gilbert Gude and J. Glenn Beall, Jr., both of Maryland, and a member of the staff of Senator Charles McC. Mathias, Jr., also from Maryland.

It was Congressman Saylor who made the prediction that the Canal would become a National Historical Park "before the snow flies." In addition, he emphasized the fact that all of Maryland's Congressional delegation in the House supported the bill on strictly a non-partisan basis. "The Canal," he said, "is so intimately intertwined with American history that it should be preserved for all Americans."

Saylor also told the meeting that he was confident that the Senate, which has twice voted to make the Canal a national park, whould quickly follow the House's lead this year. He quoted Senator Alan Bible of Nevada, Chairman of the Senate's Interior and Insular Affairs Subcommittee on Parks and Recreation as saying that the Senate is waiting for the House to take the lead.

In the meantime, Saylor continued, "I will urge all interested persons along the Canal-- in Maryland, Virginia and West Virginia-- to organize their support and inform the House Committee on Interior and Insular Affairs."

The C & O Bill, he explained, is an orderly and necessary first step toward making the entire Potomac Valley not only a beautiful recreation area but a site of historical significance and a major step in cleaning up the country.

The Association is intensifying its efforts to achieve these goals and hopes that "before the snow flies this fall" it can start palling a suitable ceremony marking the establishment of the Canal as a National Historical Park. It was President John Quincy Adams who "broke ground" on July 4, 1828 for the construction of the Canal; it is the Association's hope that by July 4, 1971--143 short years later--that millions of Americans will be able to enjoy 'the scenery and historic and recreational values of the Potomac riverscape.'

## LEVEL WALKERS REPORT

Level Walkers are reminded that reports are due at least twice a year--the dates being 30 June and 31 December. Actually I would like to have your reports at any time--the main thing being that each section be fully described at all times. There are many sections which have not been reported on for some time--most of these are held by C&O Canal "Old-Timers." There are now only two sections which are unassigned. In the very near future, there will be a waiting list for those who want Level Walker assignments; at that time pressure will be put on those who do not report on their sections. One solution is to assign an active Co-Level Walker, where the original assignee, some going back through many years, wants to retain the sentimental ties he has with the Canal and the section assigned. This will be worked out in individual cases. As the Hike Guide work progresses, those sections which are not complete present a real problem, so your cooperation is needed. I would also ask that your reporting be keyed to the mileages in Orville Crowder's notes, rather than a narrative describing general conditions. Most of you have done this and significant gaps in the over all work have been filled in the past few months. Now, on to some specific remarks passed in by Level Walkers since our last issue:

- 1 Rae Lewis 0.00 Georgetown Tidal Lock to Old Boat Incline continues as the "Washington Reporter" for your Chairman. Without her continued flow of information on events in the Washington area and elsewhere concerning the Canal, many things would be left undone and unreported.
- 2 Bill Johnson 2.1 Old Boat Incline to Lock 5 continues his work on the Old Boat Incline and many aspects pertaining to the Canal. Bill Remarks: "I made a trip to Lock 5 early in May to see if I could find any remaining jack-in-the-pulpits. I found a number of plants without going far into the valley which is downstream a short distance from Lock No. 5. Also while I was on this trip, I was talking to a couple who had been hiking up and down that area and who asked me what a certain tree was. I do not remember having seen the flower that they showed me at the time, so I was unable to answer. They told me though that the location of the tree having the flower was between Lock 5 and 6, which was outside my area. I went up there and found the small cluster of trees having that flower and brought one of the flowers home and looked it up in one of the books that I have and found that it was a variety of paw paw tree. After the frost comes in the fall, I will try to remember to go back there and sample the fruit and see if it is as good-tasting as some of the other varieties are." Also received from Bill was a data sheet on Paw Paw Tunnel, which he had obtained from Ralph Donnelly. (The sheet will be produced in Along the Towpath when we do the section on the Tunnel.
- 3 Philip Stone 5.0 Lock 5 to Cabin John Creek included a listing of wild flowers and birds, noting that the bird listing "was quite disappointing as there are normally many more species present this time of the year." He also reports that "there was no sign of damage to tips of tree branches from the 17-year cicadas, in contrast to the prevalence of such indications in the upland residential areas not far from the Canal area."
- 4 Keh Phifer 7.5 Cabin John Creek to Lock 14 sent in an interesting report, noting that in two hours he observed 73 cyclists, 68 hikers, three fishermen, three joggers and "one man sleeping" during the morning hours of 13 June.

- 19 Lyman Stucker 48.20 Point of Rocks to Catoctin Aqueduct though mending from a broken collar bone still got out to his section and reports good parking at 48.38 where the Canal passes under the highway bridge. He states at 51.53, "Catoctin Aqueduct was once a very beautiful aqueduct. Three stone arches have been damaged heavily by the creek. Probably not practical to restore from an economic standpoint."
- 22 Tom McDonald 58.0 Wererton to Harpers Ferry submitted an interesting report adding new material to the basic notes.
- 31 Harold Cramer 79.4 Lock 40 to Marsh Run Culvert in correction to the basic notes: adds: item on a lime kiln and Potomac Valley Farms Real Estate development at Lock 40 (79.41); NPS Hiker-Biker Camp (water pump and latrine) at Horseshoe Bend (79.7); trees removed from canal bed and therein neatly cut from 80.5 to 81.6; new vehicle bridge over canal bed at 81.0; and addition of footbridge and latrine at 81.6.
- 30 Art Cramer (Whoops, got the son before the father!) 76.7 Snyders Landing to Lock 40 reports towpath in excellent condition for walking or cycling.
- 42 Carl Reachard 110.42 McCoys Ferry to Ft. Frederick submitted a good report bringing the basic notes up-to-date, with good Canal access directions.
- 51 Fay White 134.1 Dam No. 6 to Sideling Hill Aqueduct submitted corrections to basic notes, remarking on the beauty of Sideling Hill Aqueduct (136.6) that "unfortunately parts of the iron railings at river overlook are in serious disrepair and collapse. Parking facilities are available. This stretch of the Canal is truly beautiful and made much more interesting because of Mr. Crowder's extensive historical information."
- 57 John Beck 153.10 Lock 61 to Lock 63 1/3 is one of our recently-assigned Level Walkers, who submitted a very complete report based on three trips to his section. Particularly helpful is his descriptions of access routes to the section. For example, "From the Washington Beltway I-495, proceed north on I-70S to Frederick, then west on I-70 to Hancock. Turn south on US 522 to Berkely Springs, West Virginia. Turn west on WVA 9, then south on WVA 29 to Paw Paw, West Virginia. Cross Potomac River into Maryland and continue on MD 151 at 156.3 miles from Georgetown on the towpath. To reach Section 57, walk north through Paw Paw Tunnel and Tunnel Hollow." (This is just one of the access directions from the Washington area he describes!) The matter of access is a perplexing one at times--certainly one that my family and I have experienced on more than one occasion--and it is a point that I would like to emphasize in your reporting.

John also has a nice, accurate way of describing the locks. For example: "LIFT LOCK 61: Lock is cement-lined. Original stone walls on approach to upper and lower gates need significant repair. Remains of lower gate rests at bottom of lock chamber. Small dam at upper gate forms small pond from drainage of Twigg Hollow. Footbridge to berm in good condition. Sluice on berm in fair condition, some sill blocks out-of-place/missing. Gate frame and crossover replaced with cement. Remains of wooden gate lies just below crossover..." It is this kind of detail which is needed "for the record," and to enable us to produce a Hike Guide for the entire Canal. Certainly more descriptive than "the towpath and locks are in fair condition." Also appreciated is John's expert descriptions of geology (which the rest of us--Bill Davies and a couple of others excluded--cannot do.) (Cont'd next page)

156.73 Rock folds and cliffs. This cut exposes an anticlinal fold in shales, interbedded siltstones and conglomeratic sandstones (few seen) of Jennings formation. Note well-exposed, alternating weak and resistant beds, especially near bottom. Small synclinal fold to the right obscured by vegetation..." John has also offered to do cartographic work for the Level Walkers, and he and Bill Clague are working on the maps which will accompany the first section of the Hike Guide, from Georgetown to Seneca. John Beck--you are indeed a welcome addition to the ranks of the Level Walkers.

- 58 Alan Franklin 154.5 Lock 63 1/3 to Paw Paw (MD 51) sent in another of his very complete, chock-full-of-interest reports, with news of interest to the canoist as well as the hiker: "After lunching at the very pleasant little camping ground about 156.22, just below the MD 51 bridge where we had left the car, we put our canoe into the river at the picnic ground and paddled downstream, around the great double bend that the canal tunnel bypasses, to the place where the Canal rejoins the river bank after passing through the tunnel. This is the site of the Sorrel Ridge Hiker-Biker (one really should add "Canoer") at about mile 154.1. This stretch of the river is a fine one for the semi-skilled canoist. There are several small, but definite ridges to pass over, but in normal conditions the water is slow enough so that with mild back-paddling you can take your time about picking your way. A number of quite spectacular cliffs overlook the river along this stretch, where the severe folding of the rocks that took place during the Appalachian mountain building can be readily seen. At the end of this run, just before you pass under the fourth railroad trestle along the way (Western Maryland), you come to the upstream end of a long island separated from the left bank of the river by a narrow channel, which goes off almost at right angles to the river. This channel forms a delightful little woodland stream, heavily-shaded and with several small rapids, negotiable, but fun for the novice. The Sorrel Ridge Hiker-Biker lies on the left river bank just after this channel rejoins the main river. Canoe parties had been coming down the river all day, and it looked as we approached as if most of them had put in here for the night. At this point, I left the canoe to return to the towpath and walk my section back through the tunnel to the car. The rest of my party went on downstream, to take out at Green Ridge Station, where a road comes close enough to the river so that we could get the car into a convenient position for loading on the canoe." (Canoists--Send in other similar reports if you like)

(It is hoped that the Paw Paw Tunnel section will be covered in a fall issue of Along the Towpath--Editor)

- 69 (Reported by Bill Johnson of Section 2) 182.6 Wiley Ford to Cumberland, that "at mileage 183.55 at the long concrete waste wier, where there is a place to drain the canal basin, the underpinnings of the wooden bridge have rotted out and are apparently unsafe for motor vehicles."

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LEVEL WALKERS FROM GEORGETOWN TO SENECA--YOUR DETAILED SUBMISSIONS AND CORRECTIONS GEARED TO ORVILLE CROWDER'S NOTES ARE URGENTLY NEEDED SO THAT WE CAN COMPLETE THE FIRST SECTION OF THE TOWPATH HIKE AND GET IT OUT TO THE PUBLIC. WOULD LIKE TO HAVE ALL SECTIONS IN THAT AREA COMPLETED BY THE END OF SUMMER!!

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PLEASE NOTE CHANGE OF ADDRESS OF YOUR CHAIRMAN FROM 7845 GALT ST. TO 7535 WILL ST (FT. MEADE MD., 20755)

## ENVIRONMENTAL AWARENESS

### From Sea to Shining Sea

Who dumps old tires into our bays? Who picnics at our beaches and leaves litter for the tides to wash away? Who runs factories that pump refuse into our lakes? Who pours sewage into our rivers? Who throws all those beer cans overboard? Who's going to unpollute it all?

America, the beautiful. Our America. The crisis isn't in our cities; the crisis is in our hearts. With a change of heart, we can change the picture.--AIA/American Institute of Architects.

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Readers please note the change of titling of this column. The term Environmental Awareness seems the most appropriate, since I take it as my responsibility to make readers of this newsletter aware of some of the problems affecting our environment, particularly as its effects the C&O Canal. The actions to be taken are UP TO YOU. As cited in a recent copy of Wildlife in North Carolina, "We need another Rachel Carson" is an oft-repeated phrase, but this isn't true. We each need to be a Rachel Carson, acutely aware of our own responsibility." Incidentally, Wildlife in North Carolina is a fine monthly publication with articles of interest to all nature lovers, not just those in North Carolina. Subscription (yearly) is \$1.00, addressed to P. O. Box 2919, Raleigh, N.C. 27602.

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Sometimes it is difficult for the individual to know what actions he can take to improve his environment, even though he may know that certain problems or conditions exist. Perhaps by this column some suggestions can be passed on which may be helpful to some of you. At least it can serve as an information point to all of you--an exchange of ideas, that is. For example, the President of the C&O Canal Association at the June meeting recently set up a group of action committees to operate within the Association. One of these is the Environmental Awareness Committee, and President Ritter is anxious to have the names of those who would be willing to serve on that committee. Here is your chance!

Recently, President Ritter sent each member of the Association a letter concerning legislative hearings for C&O Canal legislation, with a request that each member write to the Congressmen listed therein soliciting their support of the legislation. How many of you have done this?

In Excerpted Remarks by John W. Gardner as Delivered to the National Press Club, December 9, 1969 (as contained in The Environmental Handbook, a Ballentine/Friends of the Earth Book available by sending \$1.00 to Dept. C.S., Ballantine Book, Inc, 36 West 20th Street, New York, N.Y. 10003) Mr. Gardner speaks on the matter of action by stating: "...one thing the citizen can do is to throw the weight of public opinion against those in the private sector who are unwilling to work toward the solution of our common problems...What firms are contributing most to pollution? Let them feel the weight of public disapproval...An important thing to understand about any institution or social system, whether it is a nation or a city, a corporation or a federal agency: it doesn't move unless you give it a solid push. Not just a mild push--a solid jolt." (As the beginning of a series of small actions which can be taken easily, my family last week shifted from heavy-duty detergents (all of them, according to the various listings I have seen contain phosphates which do not break down) to a laundry soap containing less than 1% phosphates. A modest beginning? Yes. But it is a beginning--a change of heart. Perhaps even some of those phosphates some of you are using even find their way into the Canal. At least we know that the chances of entering the Potomac River are very great.

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Now, for a change of pace, some remarks from Level Walkers concerning environmental conditions they have noted since the last newsletter, concerning the Canal itself:

3. Philip Stone 5.0 Lock 5 to Cabin John Creek notes that: "For some years the George Washington Memorial Parkway, which parallels my section, has been completed from Canal Road at Chain Bridge to a point west of Carderock where it joins MacArthur Boulevard, except that about 800 feet immediately above Chain Bridge remained unpaved. This paving was recently done and the Parkway opened to through traffic June 15, 1970. The road is rapidly becoming a commuter highway and even on Saturday morning there was continuous traffic. This definitely disturbs the peace and quiet of the Canal area between Glen Echo and Cabin John, where the Parkway is close to and only slightly above the level of the Canal. It is somewhat disturbing between Lock 5 and Lock 6, near Brookmont, although here a good many trees screen the road from the Canal.

For several months the trunk sanitary sewer in Cabin John Creek Valley has been overloaded, with frequent overflows of sewage into the creek and serious pollution in its lower reaches. This culminated in imposition of stringent restrictions on new sewer connections to buildings a few weeks ago. It was therefore a pleasant surprise to detect no odor or visible sign of sewage pollution in Cabin John Creek on my visit.

- 16 Anson Courter 39.4 Lock 26 to Monocacy Aqueduct in his personal anti-beer can litter campaign (he's not against beer, just the litter!) suggested to Anheuser-Busch, Inc. (Budweiser) that a good slogan would be: "Don't leave the Anheuser under the Busch." He had also sent to them an anti-litter ad from Schlitz, a description of Coor's offer to purchase used cans, and suggested maintenance of a collection point for used Bud cans. "I told them most hikers drink beer, but did not drop the cans. I also congratulated Bud on almost equaling all other beer cans along the C & O Canal." An extract of the answer from Anheuser-Busch is of interest: "Thank you for your letter expressing concern for our environment. Anheuser-Busch is also much concerned... Anheuser-Busch, Inc., with all other brewers, has been fighting litter since 1953. The United States Brewers Association, beginning in that year and continuing since, has been a principle supporter of KEEP AMERICA BEAUTIFUL and similar programs. In January, 1968, U.S.B.A. adopted an eight-point educational policy involving brewery employees, related wholesalers, mass media with whom they do business, and related beverage industries to promote anti-litter activities and availability of suitable trash-disposal methods in vehicles, at plants, and throughout the countryside at large... Let me assure you, Anheuser-Busch, Inc. shares your concern and is working hard to eliminate pollution and litter." Anson also sent along an article from the St. Louis Globe Democrat (provided to him by A/B), a portion of which is related to suggestions made to the beer and soft drink industry to encourage the use of bottles than cans: "Our national problem is not one that can be solved by replacing aluminum or metal with glass, or even developing better disposable containers. What must be developed is a total systems solution to the entire solid waste problem--not only in disposal but in recycling those wastes for economic re-use... The best method of not littering up the countryside is NOT TO THROW THEM THERE IN THE FIRST PLACE [emphasis added]."

Keep up the campaign Anson, and have one on me the next time we meet!

SECTION OF THE MONTH  
THE GEORGETOWN CANAL INCLINE  
HAROLD SKRAMSTAD

As one result of the 19-th century revolution in America,<sup>1</sup> the operators of canal systems were forced to recognize that the railroad posed a serious threat to the success of their businesses. The earnest but unsuccessful attempts of one canal, the Chesapeake and Ohio, to compete with the railroad are interesting not only as a footnote to transportation history, but also as a means toward a better understanding of canal technology in the latter half of the 19-th century.

The Chesapeake and Ohio Canal, begun in 1828 but not completed until 1850, was the last of the great inland waterways to the west built during the 19-th century. Although the canal had never reached its ultimate destination, the Ohio River, it had been able to compete successfully with its chief rival, the Baltimore and Ohio Railroad, for the western Maryland coal trade. Because it could afford significantly lower rates for the shipping of coal, the C & O had captured a large portion of the tonnage of coal shipped from Cumberland, the western terminus of the canal, to the east. With coal as its base, the prosperity of the canal rose steadily in the 1870s, reaching a peak in 1875. During this year the total tonnage shipped on the canal reached 973,805, while revenue from tolls came close to a half a million dollars.<sup>2</sup>

Despite the success of the canal during this period, the threat of the railroad was ever present. To meet this threat, a large and comprehensive plan for improving both the business policies and operating procedures of the canal was begun in 1870 when James C. Clarke assumed the presidency of the company and was continued by A. P. Gorman's administration from 1872 to 1881. This program included the effective regulation of tolls, a system of rebates to stimulate new areas of trade as well as to encourage high-volume shipping, and the close control of water leases so as not to lose possible income from surplus water on the canal.

In addition to tightening up the administration of the canal company, a program of operating improvements was instituted. This program included increasing the dimensions of the canal and its locks to allow the use of canal boats with a capacity of 250 tons rather than the 100- to 125-ton vessels then in operation; building a new pumping station to supply additional water to the Cumberland level of the canal, which often had to be closed due to lack of water; the purchase of a steam dredge to aid in keeping the canal clear of silt and debris; and the construction of a new outlet to connect the canal and the Potomac River at Georgetown, the eastern terminus of the canal. The history of this outlet is the story of the most complex and expensive effort undertaken by the canal company to make its operations more efficient.

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(With permission of the author, Harold Skramstad. Mr. Skramstad is a member of the Department of American Studies at the Smithsonian Institution.)

(The Georgetown Canal Incline, variously known as the Old Outlet Lock and the Old Boat Incline, is at mileage 2.26.)

<sup>1</sup>George Rogers Taylor, The Transportation Revolution, 1815-1860 (New York, 1951).

<sup>2</sup>Walter S. Sanderlin, The Great National Project: A History of the Chesapeake and Ohio Canal (Baltimore, 1946), p.307. Sanderlin's work is the only full study of the C & O Canal.

The need for a new outlet was a direct result of the increased prosperity of the canal. In December 1871 President Clarke reported, "As it now is, it is not unfrequently the case that from sixty to eighty boats have to lie along the Canal bank singly, so as to allow sufficient room in the Canal for boats to pass in opposite directions. Often a string of loaded boats from half mile to a mile in length is seen lying above the Collector's Office in Georgetown, waiting their turn to get to the wharves to discharge their cargoes."<sup>3</sup>

As important as Georgetown was as a distribution center, many boats were bound for points farther down river. Rather than operate through middlemen in Georgetown, the major coal companies that used the canal began to establish their own wharfage facilities on the banks of the Potomac. The only existing link in Georgetown between the canal and the Potomac was a small outlet lock connecting the canal to Rock Creek, which flowed into the river. Since this lock was located at the end of the canal, boats attempting to use it had to make their way through the congestion in Georgetown before being able to pass to the river. In addition, the outlet was often blocked by large amounts of silt and debris that flowed into Rock Creek.

The tremendous increase in the number of boats arriving at Georgetown brought to a head another problem that had plagued the canal company. Private wharf owners, allowed to operate unregulated along the banks of the canal in Georgetown, were extracting exorbitant wharfage fees from canal boats. This practice represented a direct threat to the attempts by the company to regulate freight rates effectively.

A new outlet above Georgetown would solve both the problem of congestion and high wharfage rates. It would reduce the congestion at Georgetown by discharging boats above that point while at the same time freeing boats from the grip of private wharf owners. The outlet would give canal boats direct access to the river, where they could be towed to any number of river points below Georgetown. President Gorman was keenly aware of the advantages of a new outlet when he pointed out that

the completion of the Out-Let Locks above Georgetown...will largely increase the facilities, reduce the cost of transferring coal from the Canal boats to vessels, and avoid the frequent handling, and heavy dump of over thirty feet (which it is alleged detracts from the value of coal shipped by Canal,) and will also then put the Company, for the first time in its history, in a position to relieve shippers from the exorbitant charges imposed by private wharf owners, by opening the discharge of boats to general competition.

Heretofore, and now, the wharf charges at Cumberland and Georgetown have been within nine cents a ton of the amount charged for tolls by the Company, for 184 miles of Canal (the average wharfage being 43 cents, tolls now 51 cents per ton.) These charges should be reduced at least fifteen cents per ton.

Not only will...Out-Let Locks produce these results, but the frequent and long delay in unloading boats, after their arrival at Georgetown, will be obviated; now at least one-fifth of the boatman's time is lost in waiting to discharge his cargo, if they were unloaded promptly upon arrival, they would realize larger profits at a reduced rate of freight charges.<sup>4</sup>

(Unfortunately, it has been impossible to reproduce four figures which accompany Mr. Skramstad's article.)

<sup>3</sup>Ibid., pp. 227-28

<sup>4</sup>Forty-Fifth Annual Report of the President and Board of Directors of the Chesapeake and Ohio Canal Company (1873), p. 17.

Such an outlet had been first proposed by President Clarke at a December 1871 stockholders meeting<sup>5</sup> and on March 11, 1872, in response to Clarke's proposal, H.H. Dodge, a local politician and president of the Potomac Lock and Dock Company, had advised the canal company that he would construct an outlet lock and lease it to the company for a sum sufficient to assure a fair return on his investment.<sup>6</sup> Dodge's proposal was well received by the board of directors of the company, and on May 10, 1872 a contract for the construction of the outlet was signed.<sup>7</sup>

Between the operating seasons of 1872 and 1873 there was a significant shift in plans for the outlet. The canal company realized that an outlet lock capable of lowering canal boats the 40 feet between the canal and the Potomac River would require a great deal of water—water that was not always available, since there was a constant scarcity of water on the Georgetown level of the canal (often falling below the minimum required for navigation). An alternative plan, suggested by the chief engineer of the canal company, was the construction of an inclined plane or lift to lower boats to river level. The interest in an inclined-plane operation was probably stimulated by the publicity given to the two major canal inclines operating at that time, those on the Morris Canal in New Jersey and the Monkland Canal in Scotland. These inclines had been described in great detail in both popular and engineering periodicals of the period and had elicited great interest from engineers on both sides of the Atlantic. The final result of this shift in plans was a change in the contract between the canal company and the Potomac Lock and Dock Company whereby "inclined planes, lifts or other devices for obtaining the same end [as the outlet locks]" was added.<sup>8</sup>

Although the start of construction on the outlet was delayed for over a year by the financial uncertainty of the panic of 1873, initial surveys for the project were begun in the late fall of 1874. The designer and engineer of the work was William Rich Hutton, chief engineer of the canal company from 1869 to 1872 and a consulting engineer to both the canal company and the Potomac Lock and Dock Company until 1881.<sup>9</sup> Hutton had considered several plans in the process of designing the project: a series of outlet locks, a single outlet lock, a vertical lift utilizing a counterweighted caisson filled with water, and an inclined plane employing a caisson moving endwise on tracks. The various plans were compared by Hutton using the criteria of initial cost, safety of operation, amount of water required for operation, and cost of operation. He rejected the use of a series of outlet locks, since they would use an excessive amount of water. A lift arrangement was also rejected, since the machinery required for its operation would be too complex and expensive. Hutton's final selection was a plan based upon a water-filled caisson moving endwise along an inclined plane, similar to the system employed by the Monkland Canal (although the Monkland system employed a dry caisson). The cost of the incline was estimated by Hutton to be approximately \$80,000, less than any of the other plans, which ranged in estimated cost from \$85,000 to \$100,000.<sup>10</sup>

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<sup>5</sup>Proceedings of the Stockholders of the Chesapeake and Ohio Canal Company, December 27, 1871.

<sup>6</sup>Proceedings of the Stockholders, April 9, 1872.

<sup>7</sup>Proceedings of the Stockholders, June 3, 1872.

<sup>8</sup>Proceedings of the Stockholders, June 7, 1873.

<sup>9</sup>Hutton was a prominent civil engineer during the last half of the nineteenth century, maintaining an office in Washington, D.C., and Baltimore and later in New York. His professional papers are in the archival collections of the Division of Mechanical and Civil Engineering, Museum of History and Technology, Smithsonian Institution.

<sup>10</sup>Report recommending an inclined plane with boat caisson, Hutton Papers, Smithsonian Institution, Washington, D. C. (hereafter cited as Hutton Papers).

The actual plans for the incline were revealed in February 1875. The project would consist of a caisson 112 feet long, 16 feet 9 inches wide, and 7 feet 10 inches high. This caisson would rest on six six-wheeled trucks and would move on two pairs of iron rails 600 feet in length at a slope of 1:12. The caisson would be balanced by two counterweights, each moving on two pairs of iron rails at a slope of 1:10. The system was to be interconnected by two steel wire ropes extending from the caisson to two pairs of winding pulleys, one pair to the left of the caisson and one to the right. Each wire rope would then make  $2\frac{1}{2}$  turns around the pulleys, pass through a sheave connected to the respective counterweight, and finally be anchored to the masonry headwall of the incline. The travel of the counterweights would thus be one-half that of the caisson. Power for the winding pulleys would be supplied by a water turbine drawing from a sluiceway running between the canal and the Potomac River, thus taking advantage of the 40-foot difference in elevation between the canal and river.<sup>11</sup>

Actual construction of the incline began in the spring of 1875. Work on the masonry of the headwall and railbed was well under way when the proposal for bids on the incline machinery, caisson, and counterweights were sent out in June 1875. Three companies bid on the work: the Vulcan Iron Works of Baltimore, Patapsco Bridge and Iron Works, and the South Boston Iron Company. The Vulcan Works was awarded the contract for their low bid of \$21,450 for caisson, counterweights, machinery, and rails.<sup>12</sup> Two 760-foot lengths of  $1\frac{1}{3}$ -inch--diameter steel wire rope were supplied by John A. Roebling's Sons,<sup>13</sup> and a  $26\frac{1}{2}$ -inch Leffel turbine was purchased from the machinists Poole and Hunt of Baltimore.<sup>14</sup> The incline was completed in the spring of 1876, and the first canal boat passed from the canal to the river on June 29, 1876.<sup>15</sup>

The operation of the incline was quite ingenious. The caisson was brought up against the headwall and held fast by means of a hydraulic cylinder; gates in the canal lock and in the caisson were opened; and water was admitted to the caisson, filling it canal level. The canal boat then passed from the canal into the water-filled caisson. The gates were closed and the caisson lowered to the river under the power of the water turbine until the water level inside the caisson was equal to river level. The lower gate of the caisson was opened and the boat allowed to pass into the river. During the process of lowering the boat into the partially filled caisson, it was possible to adjust the water level so that the total weight of the caisson, water, and boat was approximately equal to that of the counterweights. If the level was adjusted properly, the water turbine would have to supply only enough power to overcome friction in the machinery, thereby minimizing the amount of water required to power the system. Hutton rejected, however, the possibility of using the level of the water in the caisson to overbalance either the caisson or the counterweights, thus enabling the entire operation to be carried out without any additional power supply. He felt that this method of operation would be too hazardous. In case of a failure of either the cable or the winding machinery, the incline employed an elaborate braking system. The counterweights and caisson used both a pawl and ratchet system and automatic friction brakes.<sup>16</sup>

11 Proposal for an inclined plane at Georgetown, Hutton Papers.

12 W.R. Hutton to H.A. Ramsay, July 31, 1875, Hutton Papers.

13 W.R. Hutton to J.A. Roebling's Sons, August 30, 1875, Hutton Papers.

14 W. R. Hutton to Poole and Hunt, August 16, 1875, Hutton Papers.

15 H.H. Dodge to A.P. Gorman, June 29, 1876, Hutton Papers.

16 American Society of Civil Engineers, Transactions 7, no. 174 (1878): 412-13.

Application For Membership  
in the  
Pennsylvania Canal Society

On July 29, 1966, at Bethlehem, Pa., during a field trip of the Canal Society of New York State along the Lehigh Canal-- The Pennsylvania Canal Society was born.

The Society's purpose is to preserve the rich heritage of early canal days in America, and the one-time 1200-miles of canals in Pennsylvania in particular; to encourage canal research; and to make available to the public information and materials on canals, their operation and history.

Dues are \$6.00 for individual membership; \$10.00 for man-and-wife membership combination; and according to the schedule below for other membership categories. As a "bonus" for new members we offer (at no cost) a copy of the booklet "Hiking with History Along the Erie Extension Canal" by Dr. Fred Brenner of Thiel College.

Our membership roster currently stands at about 250--mainly Pennsylvanians, but including canal "buffs" in neighboring States, and as far away as California. We issue a quarterly publication, packed with new information coming to light on the old canal system. Each year we also distribute, to all dues-paying members (at no cost), one new booklet on canals. We also sponsor two canal field trips in or near Pennsylvania each year.

Knowing of your interest in transportation history, we invite you to join The Pennsylvania Canal Society. Checks should be made payable to:

Earl B. Giles, Secretary  
Pennsylvania Canal Society  
818 Belmont Street  
Johnstown, Pennsylvania 15904

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Pennsylvania Canal Society

Please enroll me (us) as members of the Pennsylvania Canal Society:

Name(s) \_\_\_\_\_

Street Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Enclosed is my check for; \$6.00 (single) \_\_\_\_\_ \$10.00 (man-wife) \_\_\_\_\_

\$25.00 (Patron) \_\_\_\_\_ \$100.00 (Sustaining Membership) \_\_\_\_\_

\$500.00 (Life Membership) \_\_\_\_\_

- 4 Ken Phifer 7.5 Cabin John Creek to Lock 14 picked up trash along the towpath, reporting, "...in the parking lot at mile 7.5, 27 pieces were found within 10 feet of the trash can. From mile 7.5 to 9.5. 65 pieces of trash were collected including an inner tube, many beverage cans, styrofoam cups, a sneaker, gum wrappers, cigarette packages and a toothbrush. More trash cans are needed, particularly at the various locks.

- 17 Ray Teele 42.2 Monocacy Aqueduct to Noland's Ferry in a letter to the Executive Director of the Audubon Naturalist Society of the Middle Atlantic States hit several subjects re the Canal, but not necessarily connected with his section. Parts of his letter are quoted herein:

"As you know, the Society's Field Trip Committee regularly schedules hikes along the Chesapeake and Ohio Canal for studies of birds, plants, geology and ecology in general. The latest was a trip to the Paw Paw section with the particular aim of studying plant communities which differ from those found closer to Washington.

"When we arrived at Paw Paw we were sickened to find that the plants along the towpath had been sprayed with herbicide. Lavish use of the chemical had been made at the locks, and a less appetizing place to eat a picnic lunch can hardly be imagined.

"Those who have responsibility for the Chesapeake and Ohio Canal National Monument are obviously unaware that it is a great natural gem to be cherished. Their lack of appreciation is demonstrated by their ... ability to choose the most interesting natural areas for their campsites. At Indian Flats they passed over a large patch of nettles and garlic mustard to clear out Virginia Bluebells for the camp. Another campsite near Shepherdstown was formerly well-known for its great variety of spring flowers. The last time I was there I found a fine stand of ailanthus. At the PEPCO plant near Monocacy all vegetation on both sides of the Canal has been destroyed. It now presents a fine example of soil erosion. An added attraction is a roadway dam across the Canal, which has created a slimy mess suitable only for the breeding of mosquitos. At Pennyfield the sewer contractor was permitted to dispose of excess dirt by piling it around the trees between the Canal and the Potomac ... I could go on.

"Of course, one way of looking at it is that in addition to being a great historical monument and an outdoor laboratory for the study of natural history, the Canal is now also a glaring example of man's indifference to his environment."

- 19 Lyman Stucker 48.2 Point of Rocks to Catoctin Aqueduct points out "that a culvert under this point is in need of cleaning out. Causes water to back up in local yards after heavy rain. At 48.40 Canal is obstructed with rocks and debris from railroad construction. One track was moved out of tunnel so the other track could be located in center of tunnel allowing larger cars. At 48.93 many small weekend-type dwellings along here between towpath and river. Some poor condition.

- 51 Fay Whyte 134.1 Dam No. 6 to Sideling Hill Aqueduct remarks that "there is some rock and dirt debris in the dry canal bed where it is closely repaired by the RR tracks. But it is still a worthwhile scenic spot."

- 58 Alan Franklin 154.5 Lock 63 1/3 to Paw Paw (MD 51) adds emphasis to Ray Teel's remarks by stating: "I was dismayed to find that weed-killer had been used along the entire length of the section, on the canal side of the towpath. It may be economical, but the results hardly does justice to a National Park, even one-to-be. The brown, ugly shriveled plants and very offensive odor assault your eyes and nose. There are no more of the lovely flowers that once grew on this bank. Surely there must be a better way in a place meant for enjoyment."

Ken Miller 7.5. Captain John Green to look it picked up trash along the township, reporting "...in the parking lot at mile 7.5, 27 pieces were found within 10 feet of the trash can. From mile 7.5 to 9.5, 65 pieces of trash were collected including an inner tube, many beverage cans, styrofoam cups, a sneaker, gum wrappers, cigarette packages and a toothbrush. More trash cans are needed, particularly at the various locks.

Ray Teele 48.2. Monocacy Aqueduct to Moulana Ferry in a letter to the Executive Director of the Audubon Naturalist Society of the Middle Atlantic States hit several subjects re the Canal, but not necessarily connected with his section.

John C. Frye, Gaillard, Md. 21756

When we arrived at Paw Paw we were alerted to find that the plants along the towpath had been sprayed with herbicide. Labeled use of the chemical was at the locks, and a less appetizing place to eat a picnic than the nearby Potomac River.

Those who have responsibility for the Chesapeake and Ohio Canal National Historical Monument are obviously unaware that it is a great natural area. The most interesting natural areas for the Canal are the areas that they passed over a large patch of native. Another example of soil erosion. An added attraction is a roadway dam across the Canal, which has created a slimy mess suitable only for the breeding of mosquitoes. At Pennsylvania the sewer contractor was permitted to dispose of excess dirt by piling it around the trees between the Canal and the Potomac. ...I could go on. Of course, one way of looking at it is that in addition to being a great historical monument and an outdoor laboratory for the study of natural history, the Canal is now also a glaring example of man's indifference to his environment.

Lyman Stucker 48.2 Point of Rocks to Gaithersburg Aqueduct points out that a culvert under this point is in need of cleaning out. Causes water to back up in local yards after heavy rain. At 48.40 Canal is obstructed with rocks and debris from railroad construction. One track was moved out of tunnel so the other track could be located in center of tunnel allowing faster cars. At 48.93 many small weekend-type dwellings along here between towpath and river. Some poor condition.

Ray Whyte 134.1 Dam No. 6 to Sidelink Hill Aqueduct remarks that there is some rock and dirt debris in the dry canal bed where it is closely repaired by the RR tracks. But it is still a worthwhile scenic spot.

Alan Franklin 154.5 Look 53.13 to Paw Paw (MD 51) adds emphasis to Ray Teele's remarks by stating: "I was dismayed to find that weed-killer had been used along the entire length of the section, on the canal side of the towpath. It may be economical, but the results hardly justify the National Park, even one-to-be. The brown, ugly shriveled plants and very offensive odor assault your eyes and nose. There are no more of the lovely flowers that once grew on this bank. Surely there must be a better way to a place meant for enjoyment."



Level Walker Chairman  
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