

## From the President

by David G. Barber

I've recently been upgrading the ACS web site, converting it from the old base program that was not up to today's standards to a new base program that is. In the process of this and some recent canal trips, I have come across progress that I want to share with you.

First, in 2010, the Delaware Canal (a state park for its entire sixty miles) in Pennsylvania was restored after flood damage from three "100 year" floods. In March, it seemed to be weathering the spring floods then happening with minimal new damage.

The most interesting event on this canal was in Bristol, PA. If you look at Google Earth aerials from April, 2010, you will still see Snyder Elementary School built across the line of the canal (despite the canal being a state park as it has been since the 1950s). But, the school was old and a new school was being built nearby (off the canal alignment) when last the Pennsylvania Canal Society toured there. If you look at the most recent views of the site on Google Earth, Snyder Elementary School is gone.

If you then look at the Levittown Shopping Center, you will see that the recent redevelopment of the center has no buildings or parking areas on the canal alignment. Thus, for the first time in 60 or so years there are no buildings obstructing the canal route. Only highways and the railroad remain. Hooray! (See p. 16-17.)

Another site I visited recently is New Bremen, OH, where at Miami



PCS Lehigh tour participants visit one of the huge locks on the Lehigh Canal and Navigation, between White Haven and Mauch Chunk, PA. Photo, Bruce Russell

and Erie Canal Lock 1 north, the lock house has been rebuilt as a corridor office and museum next to the recently restored lock. The area now looks much like it did in historic times. Congratulations to the community and to the Miami and Erie Canal Corridor Association and partners for this.

A third site to note is Tinkers Creek Aqueduct on the Ohio and Erie Canal in the Cuyahoga Valley National Park. On the watered section of the canal, the old Tinkers Creek Aqueduct was in danger of collapse and was removed a few years ago and replaced by pipes and a pedestrian bridge for the towpath. When I passed the site in early April, a contractor had removed the new bridge and pipes and

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# American Canals

BULLETIN OF THE  
AMERICAN CANAL SOCIETY

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The objectives of the American Canal Society are to encourage the preservation, restoration, interpretation, and use of the historical navigational canals of the Americas; to save threatened canals; and to provide an exchange of canal information. Manuscripts and other correspondence consistent with these objectives are welcome.

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**DEADLINE:** Material for our next issue must be on the editor's desk no later than September 15, 2011. Send to Linda Barth, 214 N. Bridge St., Somerville, NJ 08876; [barths@att.net](mailto:barths@att.net).

Material submitted to *AMERICAN CANALS* for publication should be typed and double-spaced or sent by email in

WORD format. You may send actual photographs (which will be scanned and returned), or digital versions may be emailed or sent on a CD.

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**A TRANSPORTATION CELEBRATION:  
CUMBERLAND BY RAIL, ROAD, AND WATER  
SEPTEMBER 10, 2011—ALLEGANY MUSEUM, CUMBERLAND, MARYLAND**

The nation's earliest efforts to create an interstate transportation system were centered around Cumberland, Maryland. The Queen City was the beginning of the Cumberland/National Road, a strategic spot for competing railroads aiming to move coal and other natural resources through the nation, and the western terminus of the C&O Canal.

This year marks the 200th anniversary of the groundbreaking for the first federally funded road in America, the Cumberland/National Road, which ran from Cumberland to Vandalia, Illinois. Later, other road routes connected to this road, creating a coast-to-coast highway.

Cumberland was a major railroad town as well. It was home to the B&O Queen City Hotel Station, round houses, tin shops, and rolling mills, and later the Western Maryland Railway.

As terminus to the C&O Canal, Cumberland was a busy boat building center and the transfer point for the coal from Western Maryland mines being shipped east along the waterway. What better place to celebrate and tell America's transportation story. Join us to hear the stories.

**Registration:** to register online go to [www.cumberlandtranspo.org](http://www.cumberlandtranspo.org).

For further information: Cumberland C&O Canal NHP Visitor Center, 301-722-8226, ext. 0.

9:30	<b>Terminus Basin Walking Tour</b>	Rita Knox
10:15	<b>Registration and Coffee/Welcome</b>	Albert L. Feldstein, Moderator
10:45	<b>The National Road and Its Contribution to the Constitutional and Transportation History of the United States</b>	Theodore Sky
11:30	<b>The B&amp;O—C&amp;O Battle for the Potomac Route to Cumberland</b>	Karen Gray
12:15	Lunch break	
1:30	<b>The Queen City Hotel Station</b>	James Rada
2:15	<b>The Interrelationship Between the Railroads and the C&amp;O Canal in the Development of the Canal Basin Area of Cumberland, Maryland</b>	William Bauman
3:00	Break	
3:15	<b>Reconstruction of the Cumberland/National Road</b>	Steve Colby
4:00	<b>Panel Discussion and Q&amp;A</b>	Sam Tamburro, Moderator
4:45	<b>Closing remarks</b>	Albert Feldstein
5:00	<b>Reception at the Gilchrist Gallery, 104 Washington Street</b>	

Name \_\_\_\_\_  
 Organization/Affiliation \_\_\_\_\_  
 Address \_\_\_\_\_  
 City, State, Zip \_\_\_\_\_  
 Email \_\_\_\_\_  
 Phone (s) \_\_\_\_\_

Number x Lunch (assorted wraps, chips, cookies, and drink) x \$6 = \$ \_\_\_\_\_  
 Number x Registration x \$15 = \$ \_\_\_\_\_  
 Total enclosed= \$ \_\_\_\_\_

Make checks payable and mail to the Cumberland Transportation Forum, c/o Kelli Allaway, 12234 Williams Road, Cumberland, MD 21502. Please register by September 7.

## PENNSYLVANIA CANAL SOCIETY TOURS UPPER LEHIGH CANAL

story and photos by Bruce J. Russell

On the weekend of April 16-18, 2010, the Pennsylvania Canal Society toured the Upper Division of the Lehigh Canal, from White Haven to Mauch Chunk, a distance of twenty-six miles. This section was completed in 1838, during America's Great Canal Era, but survived only until 1862, when a combination of flood damage and competition from railroads caused its demise. Unlike most 19th-century canals which had manmade channels, the Upper Division of the Lehigh was known as a "slack water navigation," which uses a river, divided by dams into a series of pools.

One of the most remarkable features of the twenty-nine locks was their height, up to thirty feet each. These locks bypassed the twenty dams. The total descent from White Haven to Mauch Chunk was approximately 600 feet in twenty-six miles.

Using several vans rather than one large bus, our group of canal enthusiasts visited several of these 162-year-old lock chambers and viewed the remains of some of the dams spanning the Lehigh River. It's amazing that any of these structures, built primarily of loose stones, still exist.

The vans used a former railroad alignment that ran parallel to the Upper Division, now converted into a hiking trail. The tour leaders obtained special permission from the Lehigh Gorge State Park to use this stretch, and one of the rangers accompanied us.

The success of the weekend



Close-up of one of the tunnels used to drain water from the bottom of the lock on the Upper Lehigh Canal. Use of such tunnels enabled a lock to be emptied in three minutes. Note the use of crude, rubble stone held together without cement. Construction dates to the 1830s.

was due to the advance planning by PCS members Bill Lampert, Gordon Perry, Lance Metz, and David Fry. They determined which sites were accessible by our vans and arranged for other activities, including a slide presentation on the evening prior to the tour and a hike along the remains of the famous Mauch

Chunk Switchback Railroad.

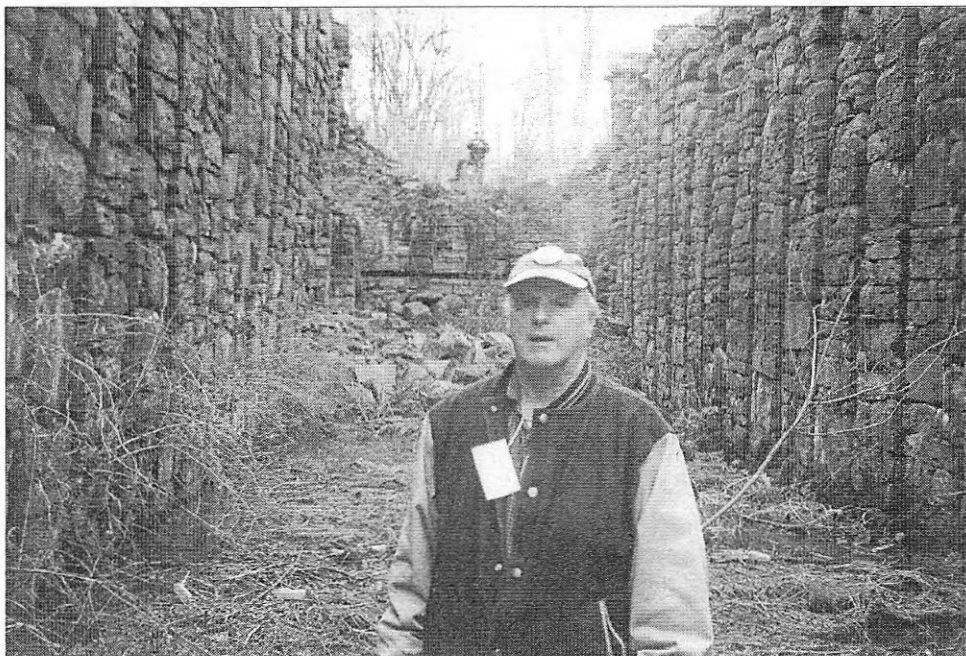
PCS has been running trips for many years over various segments of the Keystone State's once extensive canal network, which at its peak in the 1860s connected with the canals of Ohio, New Jersey, and New York. Although major portions are now obliterated, there remains much to be seen and

explored by the canal enthusiast.

On Friday, the participants checked into the Hampton Inn of Lehighton, where they received an orientation packet containing considerable material on the Lehigh Canal, which has always been divided into two parts, the lower and upper sections. It was so named because it paralleled the Lehigh River, a shallow stream that originates in Gouldsboro, Pa. in the Pocono Mountains, and flows south to Easton, merging with the much wider and deeper Delaware River.

Whenever possible, America's towpath canals were situated adjacent to rivers because they could easily tap them for water. The alternative was the costly maintenance of reservoirs, usually constructed at the summit level of a canal. Some canals, but not the Lehigh, used steam-powered pumping apparatus to lift water to these holding areas, to replace loss from both lockage and normal evaporation.

According to the booklet, "The Lehigh Canal: A Thumbnail History," by John P. Miller, the purpose of the canal was to move anthracite coal to markets in Philadelphia and New York City. This coal was discovered during the late 1700s in the Appalachian Mountains of Northeastern Pennsylvania, in the Scranton-Wilkes-Barre-Nanticoke area. The advantage of anthracite was that it burned with very little flame and produced no thick black smoke, as did soft or bituminous coal. This was due to its high carbon content. Because the available supply of wood for fuel was rapidly diminishing as trees were cut down, new fuel was viewed as a logical replacement. The challenge was getting it to where it



The author standing inside the chamber of Lock #29 on the Upper Lehigh Canal. Considering that it was last used in 1862, the state of preservation is remarkable. Sadly, nothing has been done to stabilize these remains.

was needed and where it could be sold profitably.

The initial solution was the use of wooden vessels known as arks. Although they varied in size, a typical ark of the early 1800s was approximately 65 feet long and 14 feet wide, and possessed a carrying capacity of 14 tons of anthracite coal. The first arks departed on August 9, 1814, from the vicinity of Mauch Chunk, Pa. (today's Jim Thorpe). The source of the coal was Summit Hill, where large deposits existed. Wagons brought it to the Lehigh River, where the arks were loaded. Each ark had a pilot and five crewmen. Although some of these wooden craft succeeded in reaching Philadelphia via the Lehigh and Delaware rivers, others did not. Some struck submerged rocks and broke apart, their cargo spilling into the river. Those arks that did reach Philadelphia were unloaded and the coal sold. The

arks themselves were not designed to make a return journey. Instead, they were broken apart and their timber sold. By 1815, arks loaded with coal were a common sight on both the Lehigh and Delaware rivers.

In 1817, Josiah White, George Hauto, and William Briggs held a series of meetings to discuss making improvements to the Lehigh River along an 84-mile stretch from Stoddardsville to Easton. By 1820, some work had been done on the portion between Mauch Chunk and Easton, making it safer and more navigable. A series of wing dams were constructed to concentrate the flow of water over shallow spots. Two locks were associated with these dams. This helped, but problems persisted, including lack of sufficient depth to prevent the loaded arks from scraping the bottom of the river.

Something better was needed to handle the projected tenfold increase in demand for anthracite coal. Furthermore, another

company, the Schuylkill Navigation, had succeeded in making the Schuylkill River navigable for most of its distance from the anthracite region to Philadelphia and posed a threat to the Lehigh interests. Consequently, in 1822 a new company, the Lehigh Coal & Navigation, was created to make the Lehigh River fully navigable from Mauch Chunk to Easton, a distance of forty-six miles. Unlike other canals in Pennsylvania that were state-owned and built, the Lehigh was from its inception a private enterprise in the capitalist tradition.

As with so many things, timing is everything. When the Lehigh Coal & Navigation Company was created in 1822, railroad technology was in its infancy. Throughout England and in parts of America, primitive railroads were coming into use to move coal cars from mines to ports. Their drawback was cost. It was still far cheaper to move a ton of coal by water than by rail. Yet within two decades, this price advantage

would be lost. But in 1826, canals were considered the “state of the art” technology for transporting bulk quantities of various kinds, including coal; therefore, although the Lehigh Coal & Navigation considered building a railroad, the decision was ultimately made to construct a canal from Mauch Chunk to Easton.

Josiah White, head of the LC&N, hired Canvass White (no relation) to do the engineering work for his planned waterway. Canvass White had gained his experience in canals while working on New York State’s Erie Canal and had a sound reputation. He planned thirty-six miles of artificial channels, each 60 feet wide and 5 feet deep, and 10 miles of slack water navigation employing lock and dam combinations. (The proportions between artificial channel and slack water were the opposite of those found on the Upper Division of the canal, which was constructed several years later.) He envisioned boats having a 150-ton carrying capacity, and haulage would be by either mules or horses. Hence, provi-

sion was made for a continuous towpath.

Actual construction began on what would become the Lower Section of the Lehigh Canal in 1827, about the same time that work commenced on New Jersey’s Morris Canal, known for its remarkable incline planes. A total of 56 locks, whose lift varied from 6 to 9 feet, were built. (These were in sharp contrast to those constructed several years later on the Upper Section, where the lift was as high as 30 feet.) In order to convert the river into a series of deep, still pools, nine dams were built in the ten-mile slack water portion. Increasing the depth of water in the river eliminated the possibility of boats scraping bottom or striking submerged rocks. It is, therefore, accurate to say that the initial portion of the Lehigh Canal was primarily an artificial, manmade channel, with some navigation in the open, but improved, Lehigh River. The total drop in elevation from Mauch Chunk to Easton was 355 feet.

Locally quarried stone was used to build the locks. The typical lock, 22 feet wide and 100 feet long, used cut and dressed stone only on its end portions. The interior chamber was fabricated from undressed, “rubble stone.” Because tightly fitted planking was installed over these stones, however, a smooth appearance was achieved. During the life of the Lehigh Canal, these planks required periodic replacement. Following abandonment of the canal, they simply rotted away. Stone was also used to build four aqueducts and twenty-two culverts, enabling the canal cross streams.

Although most canals in the

View of Lock 27, the second tallest on the upper division with a lift of almost thirty feet.



eastern United States relied upon Irish immigrants to do the pick and shovel labor, the Lehigh's work force included Germans and Welsh. Most of the Germans were descendants of people who had left Europe in the 1700s, settling in eastern Pennsylvania and becoming farmers. The Welsh were known for their stone masonry skills and did most of the lock work. Injury and disease took a heavy toll on all of the canal laborers, with many being buried in unmarked graves. In that era, their widows and children received no pensions. The obligation of the company ended with the delivery of the worker's body at the doorstep of his home.

In the 1820s, few if any labor-saving devices existed. If a tree had to be cut down, sometimes its stump remained firmly attached to the ground by its roots. A device called a stump puller was used to remove it. This consisted of two 15-foot-high wheels connected by an axle. A heavy chain was wound around the axle, with one end attached to the stump and the other to a team of oxen. As the beasts moved, the wheels turned, and the stump was extracted. Black powder was sometimes needed to blast out rock formations, and frequently this caused injuries.

The work was finally completed in 1829, and water was admitted into the canal from the adjacent Lehigh River. By June the first boatloads of coal began moving out of Mauch Chunk, bound for Philadelphia. Until 1832, the coal was transferred at Easton to arks that transported it down the Delaware River to the Quaker City. But in 1832 a canal running parallel to the river was completed, permitting Lehigh

boats to make a continuous journey by inland waterway as far south as Bristol, Pa., near Philadelphia. In 1831 the Morris Canal across northern New Jersey opened for business, and LC&N boats used it to reach the Hudson River, opposite New York City. These vessels consisted of two sections connected by a hinge, so that they could get over the crests of the 23 inclined planes of the Morris Canal. Many photos exist of LC&N "hinged boats" traveling the 102 miles of the Morris Canal from Philipsburg, NJ, opposite Easton, PA, to Newark and Jersey City. A cable ferry was used to get the boats across the Delaware River from Easton to Philipsburg. In 1834 the Delaware & Raritan Canal, on the New Jersey side of the Delaware River, opened. LC&N boats could access the D&R by crossing the Delaware River via cable ferry at New Hope, PA, and entering at Lambertville, NJ. Thus, the LC&N boats could reach New Brunswick, NJ, where they were taken by steam towboats to Manhattan. It took about fourteen hours for a loaded coal boat to travel from Mauch Chunk to Easton. During its first few years, the Lehigh Canal also handled passenger boats, or packets.

By the mid-1830s, a transportation system based upon canals had come into existence in the eastern United States. It was slow, labor-intensive, and usable only nine months of every year, but in the days prior to railroads, it did the job of moving coal and other bulk commodities less expensively than wagons using primitive roads.

Wherever canals were found,

boat building and repair yards sprang up. There were several along the Lehigh Canal. Routine maintenance of canal boats, which had a life expectancy of fifteen years, included periodic recaulking of the seams with a mixture of tar and other ingredients and replacing rotten portions of the hulls. Most canal boat captains leased their vessels from the company, but in certain instances they were "owner-operators" and paid tolls and other fees. The latter were determined after measuring the weight of a loaded vessel and subtracting its known weight without any cargo. A typical canal boat crew worked 6 days per week, from sunrise to sunset.



## DELAWARE & RARITAN CANAL COMMISSION SAVED FOR NOW

Although still on the governor's list of commissions that should be abolished, the D&R Canal Commission is alive and functioning.

With the retirement of executive director Ernest Hahn, the commissioners hired Marlen Dooley.

The commission was established in 1974 accomplish three main tasks: to review and approve, reject or modify any action by the State in the canal park, or any permit for action in the park; to undertake planning for the development of the canal park; and to prepare and administer a land use regulatory program to protect the park from the harmful impacts of developments in central New Jersey.

## NEW CHARITY TO TAKE CONTROL OF ENGLISH AND WELSH CANALS AND WATERWAYS—The Guardian, 30 March 2011

British Waterways to be replaced with charity that will ensure public access, but may increase prices for users and businesses

The British government opened a consultation in March to decide the future of English and Welsh inland waterways and to discuss how the countries' canals and rivers should be managed.

A new charity is to be set up as part of the transfer of control of the network from British Waterways and the Environment Agency. The transfer is a key part of the government's promised abolition of quangos\*, which has also seen the Department for Environment, Food and Rural Affairs (Defra) abolish a large proportion of its arms-length bodies.

Local people are to have a greater say in how the waterways are managed as part of the biggest reform of the 400-km canal and river network for decades. By transferring ownership and operational responsibility of the publicly owned waterways to a charity, the government hopes to avoid the controversy that accompanied the proposed sell-off of the national forests. After months of campaigning against the plan, that idea was shelved in a humiliating climbdown for Defra.

The new charity will allow the waterways to be protected for public use in perpetuity, including free access to the towpaths. Environment minister Richard Benyon said: "Our inland waterways are important pieces of heritage, havens for wildlife, and vital for leisure, recreation, health and wellbeing – enjoyed by millions of boaters, anglers, walkers, and cyclists. We want to unlock their true potential, so that they are valued and enjoyed by even more people. Creating a new charitable body for waterways will give people the chance to have a greater say in the running of their local canal or river."

Several bodies involved in waterways welcomed the consultation. Clive Henderson, national chairman of the Inland Waterways Association, said: "I welcome that the government shares our vision that there should be a sort of 'National Trust' for the waterways. We have been asking for this since the middle of the last century, and we are in no doubt that this is the right way forward for the management of Britain's inland waterways. With the right governance this can lead to real, tangible, community engagement with all the benefits that this approach can deliver. Local 'ownership' of waterways will incentivise more volunteering and over time will bring new funding."

Howard Pridding, executive director of the British Marine Federation, which represents the marine leisure industry, said: "[We] support the concept of British Waterways transforming into a civil society organisation and are keen to seize this opportunity to place our canals and navigable rivers on a sustainable footing for the years to come."

However, the question of how the new charity will be funded remains to be resolved. The main agency running the waterways today, British Waterways, receives £70.2m of public money annually. Ministers have said the trust could seek funding from a variety of sources, including other charitable trusts and foundations and the private sector, though it is unclear how this would work.

The overall amount of funding needed to maintain the waterways has yet to be decided, and there are concerns that although access to towpaths will be free, canal- and river-users may be asked to pay more for leisure pursuits, or their river-based businesses.

British Waterways makes £116.9m from property, leisure use, and other sources, and the trust that replaces it may try to boost those sources of commercial income.



\*A quango is a semi-public advisory and administrative body supported by the government and having most of its members appointed by the government.





## MADAGASCAR'S CANAL OF THE PANGALANES

In the middle of our canal room in Edenton NC is a large white globe from Dbo Lab, with country boundaries outlined. The goal is to, someday, mark on it all of the Earth's major canals. So we were delighted when Clive Cussler mentioned in passing (sorry, no Cussler canal adventure this time) the Canal des Pangalanes, in his latest epic, *Lost Empire*, p. 233. You can follow this canal, or traces of it, thanks to Google Earth. It is about 50 feet wide and 400 miles long, running inside the east coast of Madagascar. Go to "Tamatave" or "Ampanotoamaizina" where you can see the canal and photos of it. At Tamatave, the northern terminus of the canal, you can see the canal's port and dozens of boats on a branch. On Google

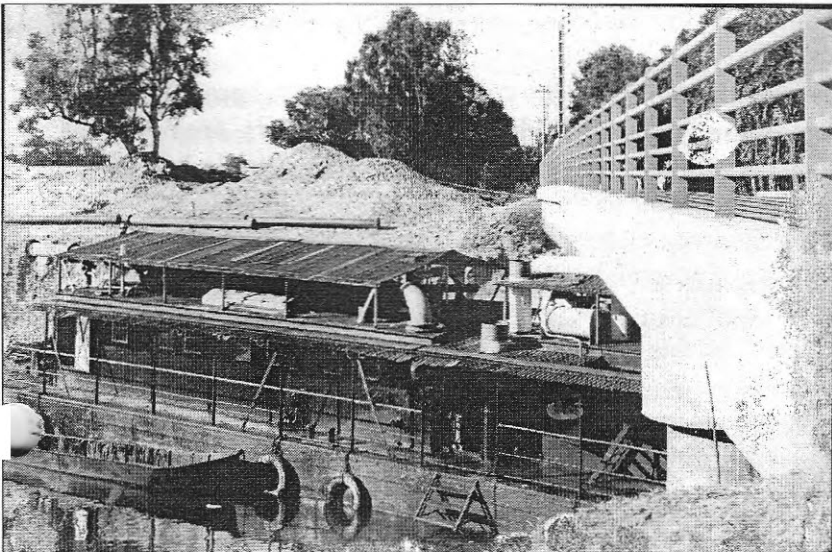


Books you can read about the turbulent history of Madagascar in *The Malagasy Republic*, by Virginia Thompson, with a history of the canal on pages 294-295, from which most of the following information is taken.

Madagascar is an island 1000 miles long and about 250 miles wide, off the east coast of Africa. Only a few stretches of its rivers are navigable. A mountain range runs along its spine, with rivers running off to east and west. Those which flow eastward down the mountain form a chain of embayments each some 20 miles wide, behind the coastal sandbars thrown up by river deposits and the fierce Indian Ocean currents. Until the canal was built, these embayments were separated from each other by rocky outcrops (what kind of rock?) called Pangalanes."

The Canal des Pangalanes is not an ancient one, but it was quite a feat. Little work was done until 1896 when Madagascar became a French colony, under the command of General Joseph Gallieni. He instituted a public works labor program to begin the island's first comprehensive road network, its first railroads, and the Pangalanes Canal. The canal was constructed in spurts, in 1896-1901, 1923, 1931, and 1953, eventually extending 659 km (395 miles) from above Tamatave down to Farafangana. In 1985-1990, 432 km (259 miles) of the canal, between Tamatave and Mananjary, were restored, enlarged, and partially relocated. Someday, we hope, the entire canal will be restored.

The canal is similar to America's Intracoastal Waterway, with dug canals and dredged channels. On Google Earth I saw no control structures, only straight ditches and spoil piles, so it is all at sea level. Today boats still ply the northern stretches of the canal where it has become quite a tourist attraction, part of a tour package - just search for "Pangalanes" on the internet. One of the sites, [www.bushhouse-madagascar.com/history](http://www.bushhouse-madagascar.com/history), has a short history of the canal and links to several historic photos (such as those on this page). If any of our readers have seen the canal, please let us know!



Bill Trout—[bill@vacanals.org](mailto:bill@vacanals.org)

## William Weston and his Contribution to Early American Engineering, Part I

by Richard Shelton Kirby, Member

(Read at the Engineers' Club, New York, and at the Iron and Steel Institute, London, April 22nd, 1936)

Early in the last decade of the eighteenth century a wave of enthusiasm for better means of communication swept over the United States. The new country was beginning to find itself, to plan vaguely for a closer physical and political coherence. But a far stronger urge, economic and localised, was evidenced by the almost frantic eagerness of the leading commercial centers to secure, each for itself, new trade routes to the west, to reach out toward the fertile lands across the Appalachians. Especially did the longer river valleys invite canals, such as were then being built all over the mother country. President Washington was a guiding spirit in three canal projects in his native state. Other canal projects were begun in Massachusetts, New York, and Pennsylvania. But it was not long before their enthusiastic projectors realized that they could not proceed with confidence without the guidance of trained civil engineers. And there were in the country practically none.<sup>1</sup> True there were surveyors like Andrew Ellicott and Simeon De Witt; forward-looking mechanics like James Rumsey; inventive mechanical geniuses like Oliver Evans; scientific men like David Rittenhouse; practical men of affairs like Loammi Baldwin and Philip Schuyler; and former engineer officers of the Continental Army like Thomas Machin.<sup>2</sup> But none of these men knew much about canal locks or turnpike roads.

### SCHUYLKILL AND SUSQUEHANNA NAVIGATION

The Pennsylvania group, led by Robert Morris, was the first to send abroad for a trained engineer. Early in 1792 one of the group wrote Patrick Colquhoun, a Scottish-born London magistrate and scholar, who had lived in Virginia as a youth, asking him to find them an engineer who could design and build canals and turnpike roads. After trying to get one Dadford, he finally secured William Weston, the subject of this sketch, who, it seems probable, was then engaged in building canals in Ireland.

William Weston was born, probably at or near Oxford, in 1753. His early training may have been begun under James Brindley, who died, however, when Weston was only nineteen. Weston doubtless served under other engineers on canals in central England. The only English work of his of which we have certain knowledge is the three-span stone arch bridge over the River Trent at Gainsborough, built during the years 1787-91. A view of the bridge, drawn by Weston himself, appears in Adam Stark's *The History and Antiquities of Gainsburgh* (2nd ed. 1843). In connection with the bridge there was a turnpike road.

In 1792 Weston agreed with Colquhoun, who was acting as London representative of the Schuylkill and Susquehanna Navigation Company of Pennsylvania, to come to America and serve as engineer and superintendent of two related canal projects which had already been begun. This company was expecting to build a canal to connect the Susquehanna below Harrisburg with the Schuylkill at Reading, while an affiliated company, the Schuylkill and Delaware, expected to canalize the Schuylkill down to Philadelphia. The leader in the combined undertakings was Robert Morris, intimate friend of Washington and one of the ablest men in the public life of his day.

Just how Weston came to be chosen and invited is something of a mystery. Perhaps Benjamin Franklin was the first to suggest the importation of a British engineer, for he had written from London in 1772 to Samuel Rhoads, later Mayor of Philadelphia:

“ I think it would be saving money to engage at a handsome Salary an Engineer from here who has been accustomed to such Business. The many canals on foot here under different great Masters, are daily raising a number of Pupils in the Art, some of whom may want Employment hereafter, and a single Mistake thro' Inexperience in such important Works, may cost much more than the Expense of Salary to an ingenious young man already well acquainted with both Principles and Practice. This the Irish have learnt at a dear rate in the first Attempt of their Great Canal, and are now endeavoring to get Smeaton to come and rectify their Errors.”

Or perhaps James Brindley the younger, who was in this country as early as 1785, may have suggested Weston to the authorities. A reputation as the foremost engineer in Europe (which he certainly was not) seems to have preceded Weston. The following are extracts from the formidable contract of nearly 2,000 words signed by Weston, Nov. 5, 1792. Weston was then of Oxford.

“The said William Weston doth hereby covenant and agree...that he will...take his passage in the Packet...

for New York or Philadelphia...and on his arrival...take upon himself the management, superintendence and direction of an inland navigation in the State of Pennsylvania, .... further covenants and agrees that...being furnished...with the usual assistance which Engineers receive he will take the necessary levels, direct the surveys and execute and furnish proper plans and sections...and will devote so much of his attention to the said undertaking not exceeding more than seven months in any one year...for the space of five years...In case the canal...is completed before the end...of five years...Weston shall be at the disposal of the said Robert Morris... with power to direct...Weston to any other object of improvement in his professional line in the States of Pennsylvania or New York...Provided always that the salary hereinafter mentioned...shall not be disturbed or diminished (sickness or absolute disqualification by imbecility or otherways excepted).

“...in consideration of the above mentioned stipulations...the said committee...will allow...the sum of eight hundred pounds sterling money of Great Britain yearly and each year...commencing from and after his departure from England the said departure to be ascertained by a certificate signed by the commander or chief officer of the ship in which he shall take his passage...Provided always that the said salary... shall be paid to the said William Weston no longer than he shall continue to execute his professional duties...it being always understood that in the event of continued bad health, bad habits or any unconquerable malady or any other imbecility or weakness either of body or mind which may render the said William Weston incapable of executing his duties with propriety and effect for the space of seven months together...the salary shall be no longer payable...”

The minute book containing a copy of the original contract is in possession of the Reading Company, Philadelphia. This railroad secured control of the canal in 1891.

Weston sailed on the *Carteret* packet from Falmouth, November 23, 1792, for New York; his salary began the day he sailed.

Up to the time that Weston arrived in the United States, there were no canals worthy of the name here. Two narrow and shallow canal ditches were being dug, the two-mile Carondelet Canal at New Orleans and the equally tiny but longer Dismal Swamp Canal, which was to connect Norfolk with Albemarle Sound. More interesting was the short South Hadley Canal, with its inclined plane up which boats were to be hauled by cables. All three of these projects came into use, in part, during 1794. One should perhaps mention also the “Patomack” locks and the James River Canal, although neither of these was progressing satisfactorily. The Santee Canal in South Carolina had been chartered, but construction work had not yet commenced.

It is interesting to note also that, at the time of Weston’s coming, while surveyors’ compasses were common in the States, engineers’ levels were almost, if not quite, non-existent. (David Rittenhouse doubtless could have made one, but it is quite certain that he had not). In fact, Weston may have brought with him the first levelling instrument used on this side of the Atlantic. It was, according to Weston’s own description, a Y-level with achromatic glasses, and had been made for him by Mr. Troughton, mathematical instrument maker of Fleet Street, London.<sup>3</sup>

Weston arrived in Philadelphia, via New York, early in January, 1793, and reported at a meeting of the President and Managers of the Schuylkill and Susquehanna Navigation Company on January 14. The board almost immediately endeavored to alter its contract with him, to the end that he should be “at the entire disposal of the Company for the said five years to be employed at any place or places within the States of Pennsylvania, New Jersey, New York and Delaware,” at a salary of £1,500 per annum. It is not clear whether such a change was made in the actual contract. Neither is it clear whether or not Weston at this time served the Philadelphia and Lancaster Turnpike Company, although this company was very anxious to borrow his services almost as soon as he arrived.

Weston seems to have begun work in the field early in February, for it was reported to the board “that he hath taken measures for sending up a level by the Harrisburg stage.” The committee also reported “that it is impossible at present to say what time it may require before Mr. Weston can determine on the propriety of the work at present performing by the labourers.”

The original scheme contemplated building a canal up the Schuylkill valley to Norristown, and improving the river from there to Reading; while from Reading a canal was to extend to the Susquehanna, via Lebanon. Weston early convinced the company of the folly of attempting to improve the Schuylkill, advising rather a canal the whole distance of about 82 miles.

Work had already begun before Weston arrived, apparently under the direction either of Doctor William Smith,<sup>4</sup> one of the managers of the company, or of David Rittenhouse, for we read in *An Historical Account of the Rise, Progress and Present State of the Canal Navigation in Pennsylvania*, 1795:

“He found more than six hundred men at work, viz. upwards of two hundred at Norristown and about four hundred at the summit or middle ground, between Lebanon and Myerstown.”

After his examination of the work, Weston made his first report, in which he suggested slight changes in dimensions and hinted that the canal might serve also to supply Philadelphia with water. In Weston's capacity as engineer and superintendent, he was obliged to hire labourers and even to supervise the manufacture of the bricks for the locks. How long Weston continued with this canal company is not certainly known. Probably about two years, for we have his report to the company for 1794 (written from Lebanon, Dec. 16), from which it is easy to infer that the financial condition of the company was fast becoming precarious.<sup>5</sup> After he left, it suspended operations. Work was resumed in 1811 by its successor the Union Canal. The canal finally completed about 1826 under Canvass White was a smaller affair than Weston had originally planned. Very soon, even though means of communication here were slow, Weston's fame had spread; it was realized that the canal company in Pennsylvania had a real engineer and that their work was doubtless therefore progressing along the most approved lines. During his stay in the United States he served as engineer or consultant on six canals, a turnpike road, a public water supply and a bridge. In other words he was associated with practically all of our earliest engineering construction projects of any importance. The projects overlap somewhat chronologically; the first has already been described, while the others will now be noted somewhat in chronological sequence.

#### **MIDDLESEX CANAL**

At the urgent request of Loammi Baldwin (the elder), Weston stole away from Philadelphia in the summer of 1794 to survey and level the Middlesex Canal in Massachusetts. One of its chief financial backers, a competent executive with much native engineering ability, who had begun the project almost single-handed, had made a special trip to urge Weston to come up. He found him engaged, he said, on the two canals and the Philadelphia and Lancaster Turnpike. Weston was then apparently on a full-time basis at £1,500 per annum. Permission was obtained from the Schuylkill and Susquehanna authorities and Weston left Philadelphia early in the summer and spent several weeks during July and August in laying out the Middlesex Canal, connecting the Merrimack River near the present site of Lowell, with tide water at Boston, some twenty-seven miles. For this he received nearly \$2200, apparently, and he certainly earned this money, for before he came up the directors had depended on a survey made by one Samuel Thompson of Woburn, according to which the canal would have to ascend 16½ feet between the Concord River at Billerica and the Merrimack. Weston found that instead it must descend nearly 25 feet; the first leveling was therefore some 41 feet in error in a matter of 5 miles. And there was incidentally an error of 35 feet on the Charlestown end, which was perhaps not quite so serious, for everyone knew that Boston was lower than Billerica.

Weston continued his contract with the Middlesex Canal proprietors for some years after he made his original survey in 1794. A number of letters from him to Loammi Baldwin are extant.<sup>6</sup> Apparently the latter wrote to his friend Weston for advice whenever a new problem arose, and Weston replied sometimes from Philadelphia (where his permanent address seems to have been c/o Richard Welles, Esq., North Third Street); sometimes from Lebanon, Pa., and later (1796 and 1797) from Fort Stanwix (now Rome), N.Y. The letters have to do with canal and lock cross-sections, with the troublesome question of watertight masonry walls and with gate-operating mechanism.

The proprietors in 1798, sent to John Rennie, in Edinburgh, certain plans of Weston's for the extension of the Middlesex Canal up the valley of the Merrimack, asking for his advice. He returned them in September of that year with a letter in which he avoided committing himself, because, he said, the information was insufficient.

#### **PHILADELPHIA AND LANCASTER TURNPIKE**

How much Weston had to do with the Philadelphia and Lancaster Turn-pike, the first of any importance in the United States, is problematical. The company was incorporated in 1792, with the aged astronomer David

Rittenhouse, who was interested in the Schuylkill and Susquehanna Canal, as one of its first “managers” or directors. Rittenhouse apparently had had general charge of the original surveys. The 62-mile road was already, then, well under way when Weston arrived, although I have thus far not been able to find that any engineer except Rittenhouse was in charge. Loammi Baldwin, on his visit to Philadelphia in 1794, when the turnpike was nearing completion, wrote of Weston’s connection with it “tho this is not directly in his profession, yet he appears competent to the undertaking.”

### POTOMAC RIVER LOCKS

In the latter part of 1794 President Washington seems to have had some interviews with Weston concerning the improvement of the Potomac River above the site of the projected federal city. The “Patomack Company” had been incorporated in 1785, with Washington as its president. James Rumsey (1743-1792), better known for his not too successful attempts at steam navigation, was at first superintendent of construction. The company aimed at canalization of the river from Harpers Ferry to Georgetown, some sixty miles. In all there were five rapids or falls to overcome, of which the most serious were the Great Falls, ten miles above Georgetown, where the river drops seventy-six feet nine inches in twelve hundred yards, and then passes through towering perpendicular cliffs. The canal, still traceable, passed around the falls with a series of five locks.

The locks at the Great Falls presented the greatest challenge to the skill of the promoters and Washington was anxious to secure the best advice possible as to their location and construction. In all probability he had never seen canal locks, and was not unwilling to listen to those who advocated alternative means, such as inclined planes. It is quite possible that Weston showed Washington a model of canal locks in Philadelphia. At any rate Weston came to the Great Falls in March, 1795, and made an examination and report of the work then in progress there. He seems to have commended the layout and to have made a particularly favorable impression on Washington, a supremely good judge of men, for in the President’s letters are frequent complimentary references to Weston’s skill and judgment.

Apparently James Brindley, a son or nephew of the builder of the Bridgewater Canal, had given his advice previously, in fact as early as 1786. Brindley had also some connection with the Pennsylvania canals. And there were other engineers, or men who posed as such, anxious to give advice to the Patomack Company, for Washington wrote in 1795 to his secretary, Tobias Lear, who was then president of the company:

“Mr. Claiborne’s Engineers [for it seems he has two for different purposes] are fixed in this City; either of which according to the use for which you want one might be had at any time; but as I am not strongly impressed with a belief that men of eminence would come to this Country in the manner and under the circumstances they have done (but this I say without having any knowledge of the real characters of these Gentlemen - and without desire to injure them) might it not be politic to obtain the opinion of the most competent of them, before Mr. Weston (who is known to be a scientific and experienced engineer) gives his? He will not adopt their opinions contrary to his experience and judgment; but if his opinion is first taken, and transpires, it may be given into by them, from the want of these in themselves, endeavoring thereby to erect a character on his foundation.”

Who these so-called engineers were is problematical. Perhaps they were young men, and French. May they not have been Marc I. Brunei, then a precocious young man of 25, and his friend Pharoux.

Weston seems to have received for his visit a fee of £370 sterling. He made at least one other visit, professional or otherwise, to the Great Falls, for he wrote Loammi Baldwin in April, 1796, that he had just returned from Virginia. The Patomack Company’s affairs did not prosper after Washington’s death. Its charter was from time to time renewed and eventually the works became part of the Chesapeake and Ohio Canal, which reached out toward the Ohio, but never got beyond Cumberland, Md.

TO BE CONCLUDED IN THE FALL 2011 ISSUE

(The footnotes will appear at the end of Part II.)

## CANAL SOCIETY OF OHIO SPONSORS ESSAY CONTEST

2011 marks the 50th anniversary of the Canal Society of Ohio (CSO). In commemoration of this event, the society sponsored a student essay contest entitled, "Are Historic Canals Important to Today's Students?" The contest was open to all fourth graders. Students won cash prizes of \$50, \$25, \$10 for their writing. Below is a report from ACS member Jenny Bowman, concerning the contest in her school.

Fourth graders at Scottish Corners Elementary in Dublin, OH recently took part in an essay contest sponsored by the Canal Society of Ohio. Jenny Bowman, the school's music teacher, is also a trustee for the society.

In recognition of the 50th anniversary of the Canal Society of Ohio, trustee Nancy Gulick initiated the essay contest for any fourth graders across the state of Ohio. During music classes at Scottish Corners Elementary, the students always learn about and sing the "Erie Canal" song. Jenny Bowman extends the activity into discussions of:

- advantages and disadvantages of using rivers vs. canals for transportation
- why it is necessary to use a bridge/aqueduct for the canal to cross a river
- comparison of a "land" elevator to a water elevator (lock)
- looking at a U.S. map and learning how the Erie Canal crossed the mountains in New York State
- looking at an Ohio canals map and learning about the populations growth in Ohio due to the Erie Canal, etc.

This year's essay contest furthered discussions about why it's important to try to save the parts of canals that still exist. Students had opinions on both sides, but after much discussion most agreed it was worthwhile to try to save them. First place winner (\$50) Elise Nelson wrote: "Today canals help students learn about Ohio's past. Visiting a canal lets people look behind the scenes of history and get a glimpse of how important good transportation was for Ohio settlers. Canals made Ohio a good place to live in the 1800s and early 1900s." Second place winner (\$25) Jordan Ansari explained: "Just like many other important parts of history (homes that were on the Freedom Trail, etc.), it would be a shame to do away with canals. The ability to visit working canals and study their importance gives us a fun experience that brings history to life." And third place winner (\$10) Rhyan Blazer wrote: "Canal towpaths could be turned into bike paths, and canal boats could be turned into restaurants or used for tours."

In addition to the cash prize, the children also received:



- certificate for winners and participants
- the map of Canals of Ohio from Ohio Historical Society (gift from me)
- the CSO brochure
- the 50th CSO anniversary patch
- places to ride canal boats in the USA (from American Canals publication)

Project advisor and CSO trustee Jenny Bowman is a member of the Canal Society of New Jersey, Canal Society of Ohio, lifetime member of American Canal Society, and a member of Inland Waterways International. She attended the World Canals Conferences in 2010 in Rochester, NY and in 2008 in Kingston/Ottawa, Canada. She has traveled to Belgium, France, England, Wales, Scotland, Poland, Germany, and Canada to view or ride on fascinating engineering marvels of international canals.

Canal Society of Ohio Awards Prizes to Student Essay Winners | (L to R) Rhyan Blazer, Elise Nelson, Jenny Bowman (SCE Music Teacher and Trustee of Canal Society of Ohio), Jordan Ansari

## A CANAL IN BRAZIL

By David Barber

South America is not a great continent for locks and canals. In fact until recently, the only locks in the continent were the two harbor locks at Buenos Aires, and these appear on aerials to be derelict. Until this spring, Brazil wasn't even mentioned in the listings of ACS index sheets. But Brazil has been working hard to develop its hinterlands to improve its economy.

One of the rivers of Brazil is the Tocantins River which flows northward to enter the Atlantic on the south edge of the Amazon delta. Between 1975 and 1984, the Tucuruí Dam was built across the Tocantins River just south of Tucuruí to provide hydroelectric power. This controversial development project submerged several rapids in the river, just to the south of the dam site, which had restricted use of the river for navigation.

Although not originally part of the project's conception, a navigation canal bypassing the dam was later added as part of Phase 2. The upstream end of the southern Lock 1 was included in Phase 1 to allow filling the pool, but the rest of the navigation effort was delayed. Despite two work stoppages for financial reasons, the six-kilometer canal and two locks have now been completed and were dedicated by Brazil's president on November 30, 2010. They are now in service.

Both locks are 210m x 33m. The southern Lock 1 at the dam has a guillotine gate at its north end and miter gates at the south end. Its lift is 36 meters. The northern Lock 2

Lock 1 at Tucuruí Dam, Brazil

gates at the south end. Its lift is 36 meters. The northern Lock 2



connects the canal to the river north of the dam. It has miter gates at its north end and what appears to be a vertically submerging gate at the south end. Its lift is 33 meters. The river north of the canal is 5 meters above sea level and the pool south of the dam is 74 meters above sea level. Opening of this canal makes possible navigation from Barra do Garcas, 2,000 kilometers northward to the sea at Barcarem. Navigation is by push boats and barges like those on the central US rivers.

YouTube has several videos on this canal and its opening. One very interesting one is the animated "Eclusas de Tucuruí." This contains an animated trip through the canal, diagrams of its major dimensions, and construction photos. Although this video and the others are in Portuguese, much can be understood from the visuals. There are also online web pages which can be translated by Google.

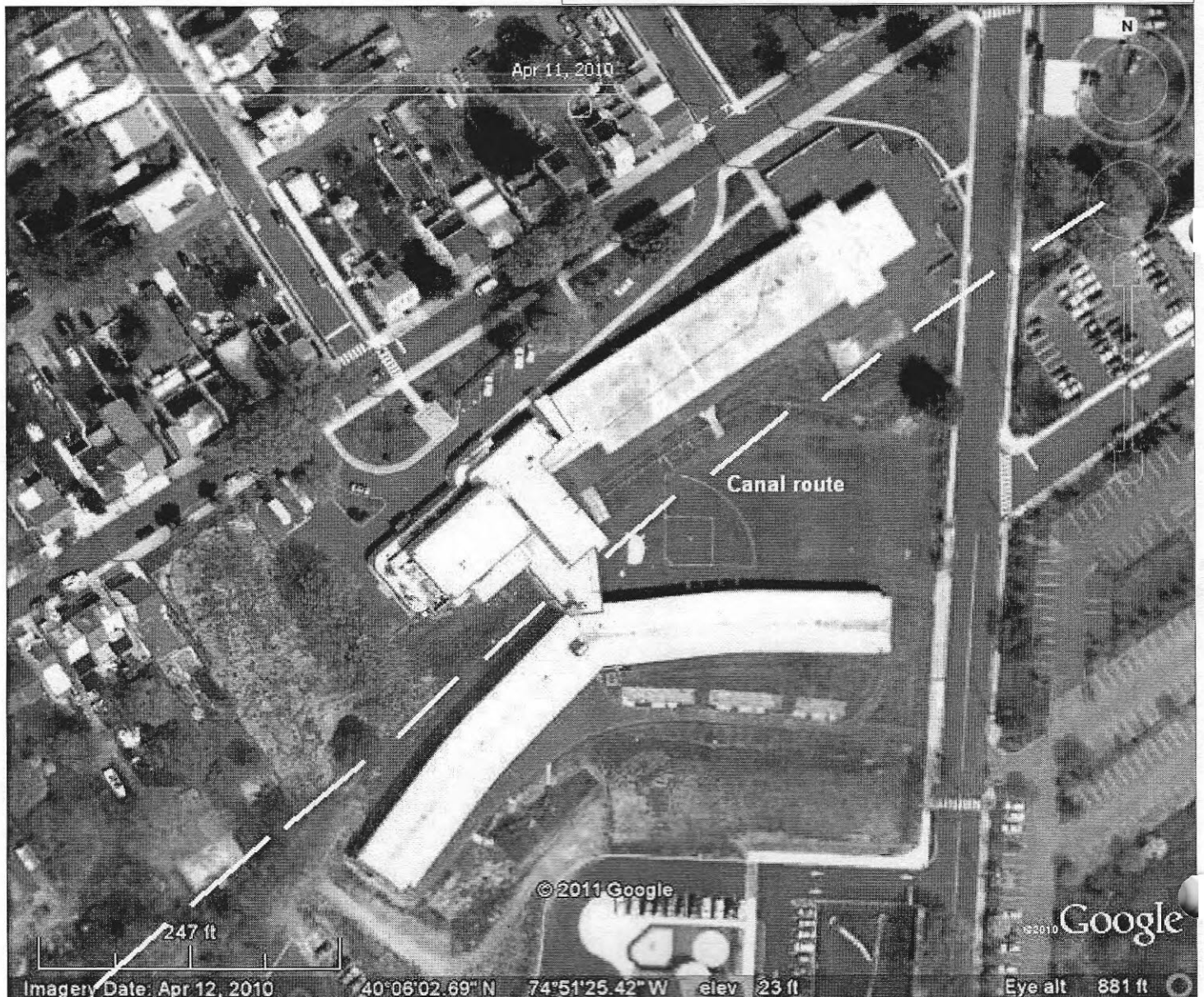
## IT'S GONE .....

By David Barber

Back in the 1950s, there wasn't a Pennsylvania Canal Society, an American Canal Society, a Friends of the Delaware Canal, or a Bristol, PA canal interest group. As a result, south of Morrisville, PA, several roads,

CONTINUED ON NEXT PAGE

Google Earth view of Snyder Elementary School April 11 2010





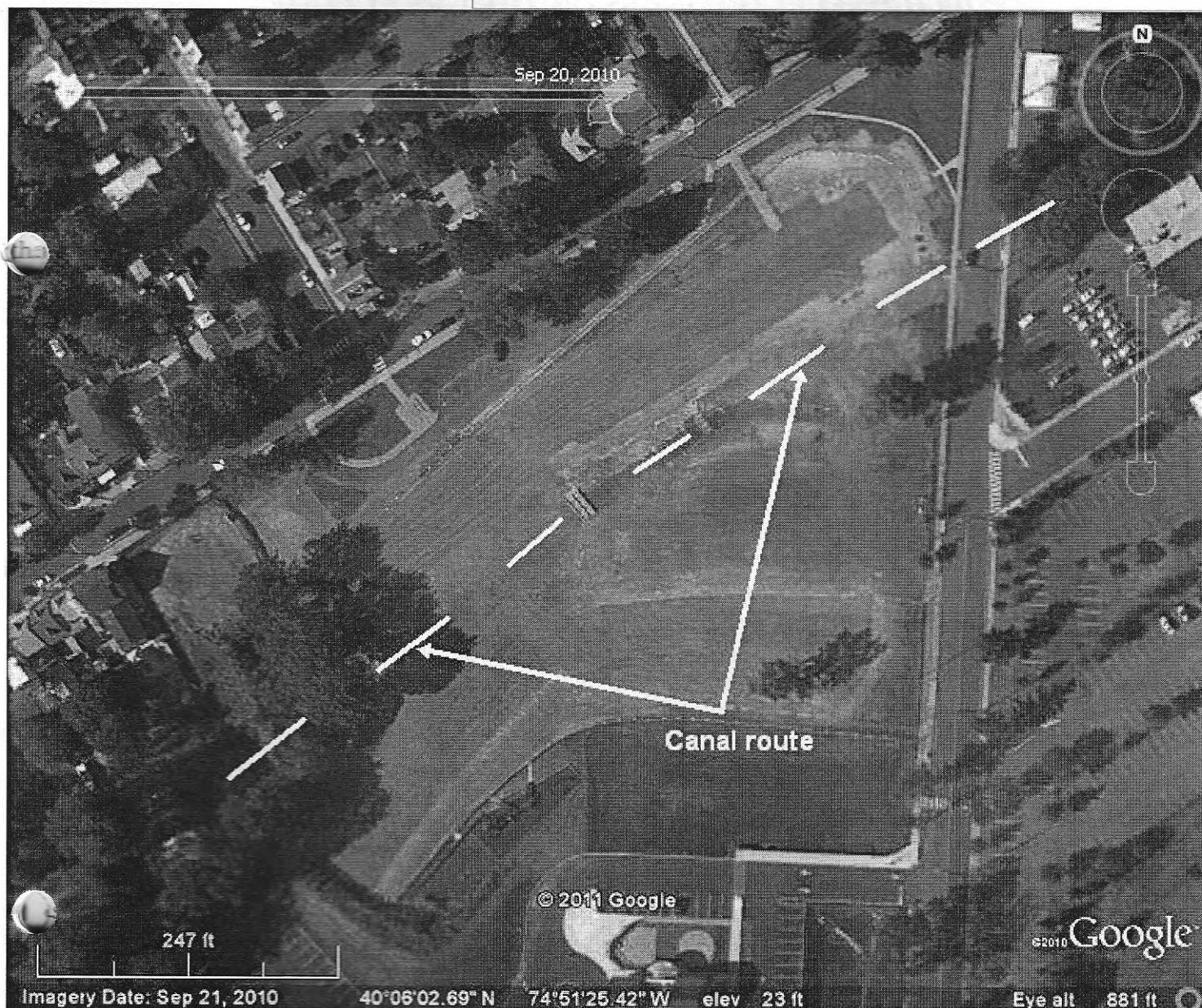
railroads and other incursions were built across the southern ten miles of the Delaware Canal, despite it being state park land. One of the most serious of these was Snyder Elementary School in Bristol, PA which was built directly on top of an old canal basin and the canal alignment. Since then, walking the canal route required a detour around the school. But, fortunately schools don't last forever and attitudes change.

In April, 2010, Google Earth aerials clearly show the school across the canal alignment as it was for several decades. But the identical view in September, 2010 shows it gone. See the attached two aerials.

Similarly interesting is that farther north along the route, the Levittown shopping center was also built on top of the canal. But shopping centers also grow old and the September, 2010 aerials show the shopping center redeveloped with no parking or buildings on the canal alignment. Thus, for the first time in over 50 years, no buildings block the canal route.

**All who worked to accomplish these corrections deserve a "Well Done!"**

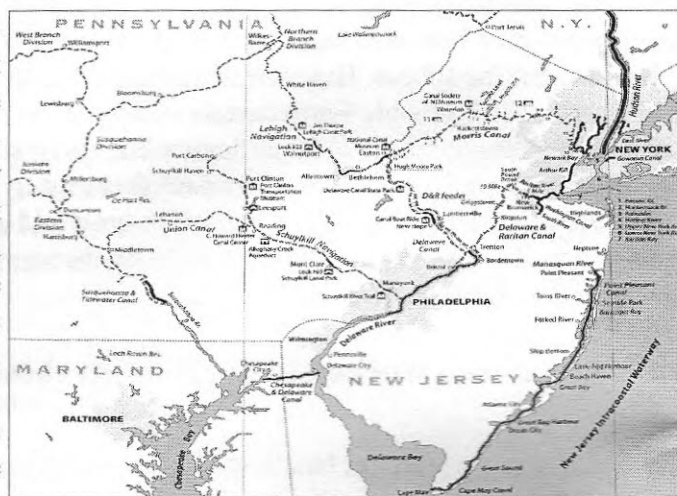
Google Earth view of the site of Snyder Elementary School September 20, 2010



## NORTH AMERICAN WATERWAYS MAP

In 2005, Euromapping published a map of the waterways of North America both current and historic, the first such map in over 90 years. Now Euromapping has made the above map available as a pdf file which can be purchased on its web site. The advantage of the digital copy is that you can zoom in on specific areas and see the great detail that may not be visible on the paper edition. You can also print out these zoomed in images. If you have the proper additional photo software, the zoomed in images can be used in Powerpoint presentations.

Euromapping's web site is [www.euromapping.com](http://www.euromapping.com). In the online shop, go to the digital section. The cost is 16 Euros. After you place an order, you will receive instructions on how to download.



## DRAGONFLY CONTINUES ON THE GREAT LOOP

We last left *Dragonfly* in Henry, Illinois in early September.

**September 13—Will They Pray in Peoria?** The crew of the *Dragonfly* had been poring over maps and clicking around to websites. The Jewish New Year was approaching; would we find a place to observe the holiday? In small rural towns, synagogues can be thin on the ground.

Luckily, Peoria (the largest town between Chicago and St. Louis) had a congregation we could visit: Anshai Emeth. On the appointed day, *Dragonfly* tied up at the Peoria town dock. Her crew made an emergency discount department store expedition, to score new khakis for the Cap'n (his lone pair of "dress" pants having long since succumbed to boat grease.) Over holiday dinner--baked salmon with rosemary, roasted potatoes, summer squash with fresh herbs--we lit candles and said the traditional prayer: "May our boat be consecrated, O Lord, by these lights." Then we hailed a taxi.

We enjoyed talking with our taxi driver, whose son had just returned from four years with the Marines in Iraq, and was now quarterbacking the local college football team. Talk about things to be thankful for in the New Year!

Anshai Emeth resembles our home congregation Brit Shalom in State College: A modern multifunctional building dating to the 1960s, housing a congregation whose roots are much older. A few years ago, the first mate did a series of radio reports about the history of Jewish congregations in rural Pennsylvania. We learned the history of Anshai Emeth in Peoria is quite similar. The first Jewish settlers arrived in the mid-1800s--liberal Jews from western Europe, who were merchants and traders. Later in the century there was a second wave of immigration from eastern Europe--more orthodox Jews from Hungary, Poland and Russia. Christian congregations were supportive and sometimes shared their houses of worship.

We had a very warm welcome from the congregants at Anshai Emeth, and we thoroughly enjoyed the services, led by a student rabbi, a young woman in a demure white blouse and killer red patent leather pumps. The choir, accompanied by two guitars and bongo drums, mixed traditional and innovative themes. A particular high point: the unconventional closing hymn, a bouncy tune that got everyone imitating the sounds of the *shofar* (the ceremonial ram's horn traditionally sounded on this holiday.)

We don't have a shofar on the boat, but we do have a conch (the shell of a very large, ocean-dwelling snail). The tip of the shell has been filed off, and if you blow very hard, you can make a loud honking sound, very similar to the call of the shofar.

Shofars and conchs were invented for similar purposes: to make a really loud noise that gets people's attention! Back in the mid-1800s, before modern klaxon horns were invented, canal boat crews used conchs to signal their intentions to other boats. We put the question to any rabbis who are reading: Is it kosher to salute the New Year with your canal boat conch?

**September 22**—From Alton we set out down the mighty Mississippi, bound for St. Louis. The Cap'n nosed the boat out into the current, and . . . Brace yourself for the G-forces! The river current took us to a blistering 9.6 mph. Like a horse let out of the barn, *Dragonfly* fairly frisked.

Our usual rate of travel, four miles per hour, is walking speed . . . the rate at which most travel proceeded for most of human history. Once you get used to this slow pace, 10 mph FEELS fast. Exciting. Even thrilling. We gawked at the riverbanks like hicks taking our first horseless carriage ride, amazed by how quickly we were going.

**September 29**—Towboats on the Radio. (*Note: Cynthia is taking a brief vacation from blogging and her husband--sometimes inaccurately referred to as the "Captain"--is filling in.*)

In our extensive--ahem--research before leaving on this trip, we read many scary warnings about tows on the major inland rivers--the Illinois, Mississippi, Ohio, and Tennessee.

First, a clarification: A TOW is actually a PUSH, a raft of barges with a powerful tug boat clamped to its tail end. Tows range widely in size. We've encountered tows as small as a single 100-foot barge and as large as six barges wide by seven barges long. Don't argue with a tow," the conventional wisdom runs. "You'll lose every time." Well, duh. These things have their own gravity wells. They plow through the water trailing dead trees, protoplanets, and giant schools of Asian carp.

Facing a moving black hole, we are VERY polite. When we spot a tow in a dicey place--such as coming around a tight bend--we get on the radio, announce our position, and VERY deferentially solicit its advice, counsel, direction, munificence.

Very rarely, a towboat operator cannot be bothered by such an inconsequential flea as our 14 tons, and we hear nothing in reply. If that happens, we pick the safest line and slip gingerly by. Or dive into a side channel and hope the thing isn't hungry.

Most of the time, however, towboat captains do reply promptly on the radio, businesslike yet polite: "So are you that little pleasure craft in front of me? I'll see you on the one." That means, "I'll pass you on the 'one whistle,'" a.k.a. port side to port side.

The tow captains we pass, mostly men, are usually spare with words to us 'pleasure craft.' But they are ALWAYS gracious to us and to each other. They thank other captains for the courtesy of passing, or advising them about hazards, or for yielding when their tow needs to squeeze through a downstream narrows. Towboat captains are bit chattier to each other than to us, and, occasionally, the radio gives us further insights.

When two tows are about to pass, they will sometimes chat for a few minutes on Channel 13 (the conventional towboat channel) or on another frequency, either by prearrangement or by telling the other captain which channel to use. ("Switch to 68.") With VHF scanning, anyone with a radio can easily eavesdrop:

#### **Mississippi River towboat chatter, Channel 68:**

Tow 1: Do you see that? That's a strange little thing! I think it's powered with those solar panels. (At this point, we're sailing past a tow, with me outside at the helm, and so apparently unable to hear their very public conversation).

Tow 2: (Inaudible)

Tow 1: ... Well, that's nice. Looks like a barge, but with solar panels. Maybe I could retire on one of them. Wouldn't need a million dollars.

[At this point, Cynthia comes up on deck, in a bathing suit. Fact: It had been several days since our last laundry and we were running low on clean clothes]

Tow 1: And look at that! He's got himself a fine-looking woman!

If there is such a thing as towboat "road rage," we never witnessed it. We speculate that a captain who didn't honor the gentlemanly conventions would soon find it difficult to make a living on these rivers.

**October 31**— This week we made a side trip east on the Tennessee River to attend the annual fall rendezvous of "Great Loop" boaters at Joe Wheeler State Park near Huntsville, Alabama. To get there, we had to transit the tallest lock east of the Rockies. This lock is so large, when you see it from a distance you figure you are almost there. It's only when the lock opens and a teeny tiny boat emerges that you realize you are still a mile away. The lock in question is the Wilson Lock (and Dam) on the Tennessee River, near Florence, Alabama. Fellow boater Mitch Brodtkin took the amazing photo (below) showing *Dragonfly* exiting the lock after being

lowered 94 feet straight down.

The story of the Wilson Lock and Dam is a story of superlatives. At the time it was built (1918-27), it was the most ambitious public works project of the era and the tallest concrete lock-and-dam ever built in the United States. (You'll remember from our visit to the Peterborough Lift Lock in Ontario that, at the turn of the 20th century, concrete was quite an innovative building material.) The dam was also our government's first-ever federal hydroelectric project; it was conceived of before the TVA was established; in fact the construction of this lock and dam inspired President Roosevelt to create the TVA. It was also the first time the U.S. Army Corps of Engineers built a multi-purpose dam; besides generating power, the structure allows big boats to get past the rapids at Muscle Shoals, aiding commercial navigation; it's also used for flood control.

Here's an interesting sidelight in history: Shortly after construction on the dam started, in 1921, Henry Ford offered to buy it from the federal government for \$5 million. Ford imagined building fertilizer plants and turning the town of Muscle Shoals, a sleepy cotton town, into a metropolis, and pledged to employ a million workers in new auto plants. Since the initial cost of construction was more than \$40 million, the numbers hardly added up and the government said "no" to Henry. The dam stayed in public hands.

**December 22**—We've spent the last few weeks plotting and planning how to cross Florida's "Big Bend," the U-bend where Florida's Panhandle meets the West Coast. The Gulf Intracoastal Waterway doesn't go around the bend; you have to cross open water. For a boat as slow as ours, it's quite a puzzle figuring out how to make the crossing. You have to factor in hours of daylight, timing of the tides, predicted wave height and wind direction, and which harbors a creeping SlowBoat can reach before the weather changes. The Cap'n spent hours checking charts and seeking local knowledge. Finally, a plan: early Tuesday we would leave Carabelle, Florida, and cross to Steinhatchie, a little fishing town. Total distance: about 75 miles. To get a little jump on the trip, we left Carabelle Monday afternoon, to anchor at Dog Island, a sandy barrier island about six miles offshore.

Instead of dinghying ashore to collect shells, we got down to boat preparations. Made a windscreen from a tarp, tied whistles and waterproof lights to our life jackets. Charged the portable VHF radio. Laid in a course on the chart plotter. At 1:00 a.m., we pulled on our layers of gear, weighed anchor, and headed out past the blinking red and green buoys into open water.

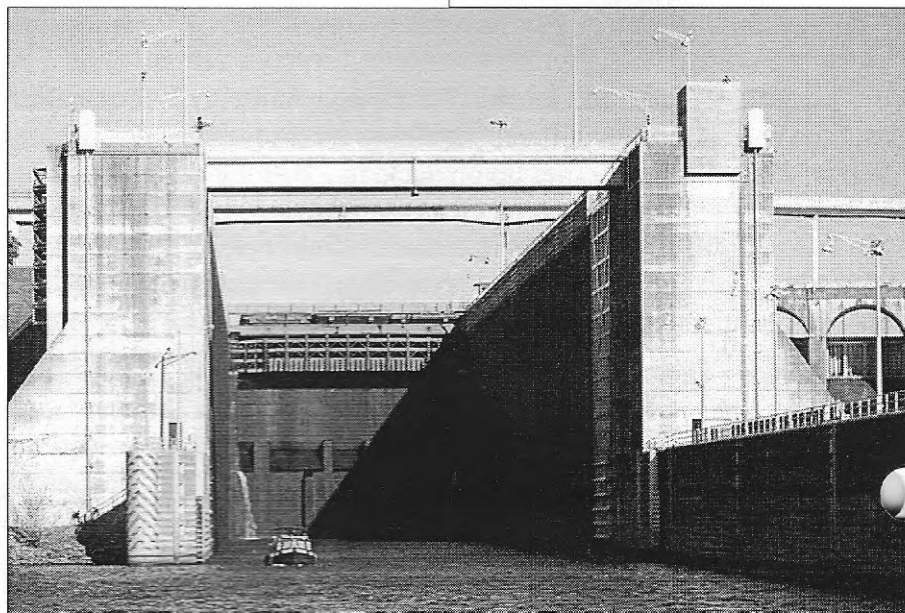
Just by chance, a total eclipse of the moon was getting underway. We watched the earth's shadow taking bigger and bigger bites out of the flat, glowing disc. By 3:17, we had a spectacular view of a faint, lurid-orange moon, completely eclipsed by the Earth's shadow. When the moon re-emerged, it felt like sunrise. We drove on and on, finally cheered by the actual sunrise. By 4:00 pm we were threading our way up the river at Steinhatchie, a river town with the reputation of preserving the ambiance of Old Florida. A kettle of vultures boiled up. Several dozen of the ugly birds landed on corrugated roofs, the better to check us out. We told them, "Sorry, guys. You'll have to find other roadkill. We didn't sink the boat today."

**December 30**—But the fun wasn't over. From Steinhatchie we needed to make two more hops, more than 60 miles each, before we reached Tarpon Springs and rejoined the Gulf Intracoastal Waterway.

At Tarpon Springs, after a dinner of grilled octopus and retsina, we set out in search of the slow moving marine mammals we consider a perfect mascot for our boat: manatees.

(to be continued)

Dragonfly exiting Wilson Lock, with a 94-foot lift, this is the tallest lift-lock east of the Rockies.



## *Restoration of the 1844 Nine Mile Creek Aqueduct in Camillus Honored*

The Preservation League of New York State has selected the restoration of the **1844 Nine Mile Creek Aqueduct** in Camillus, Onondaga County, to receive an award for Excellence in Historic Preservation.

The League's statewide awards program honors notable achievements in retaining, promoting and reusing New York State's irreplaceable architectural heritage.

"High quality restoration work aside, the narrative of this project is breathtaking in the scope and scale with regard to collaboration," said Jay DiLorenzo, president of the Preservation League. "The all-volunteer Camillus Canal Society's unyielding dedication to the restoration of this portion of the canal is truly commendable. The restoration of the aqueduct and re-watering of a portion of the prism are most ambitious and appropriate."

Contributing to the success of this project were Vector Construction Company, Senator John DeFrancisco, Assemblyman Hal Brown, and a dedicated corps of volunteers and professionals who donated countless hours to the restoration.

The 1844 Nine Mile Creek Aqueduct is the only restored navigable aqueduct in New York State, one of 32 constructed in the first enlargement of the Erie Canal in New York State, of which only seven remain intact. The aqueduct – a water-filled bridge that carries canal boats over rivers, streams or valleys – is the centerpiece of the Camillus Erie Canal Park, located at the midpoint between Albany and Buffalo. Four stone arches made of fine Onondaga limestone quarried from Split Rock support the towpath.

According to Dr. David Beebe, president of the Camillus Canal Society, "In 1990 a group of people began to seriously study how to restore the aqueduct to operating condition. In 1996, the Camillus Canal Society was formed, enabling us to seek funds from local, state, federal, and private sources. The impact of the restoration project has been quite significant: we are able to bring boats over the aqueduct and extend our narrated historical trips for an additional mile. We have seen a great increase in visitors with the opening of the Erie Canalway National Heritage Corridor, and according to a recent study, the 1844 Nine Mile Creek Aqueduct is one of the most utilized sites along the Canalway Trail. We are a key to economic growth in the region, and are truly honored to receive this recognition."

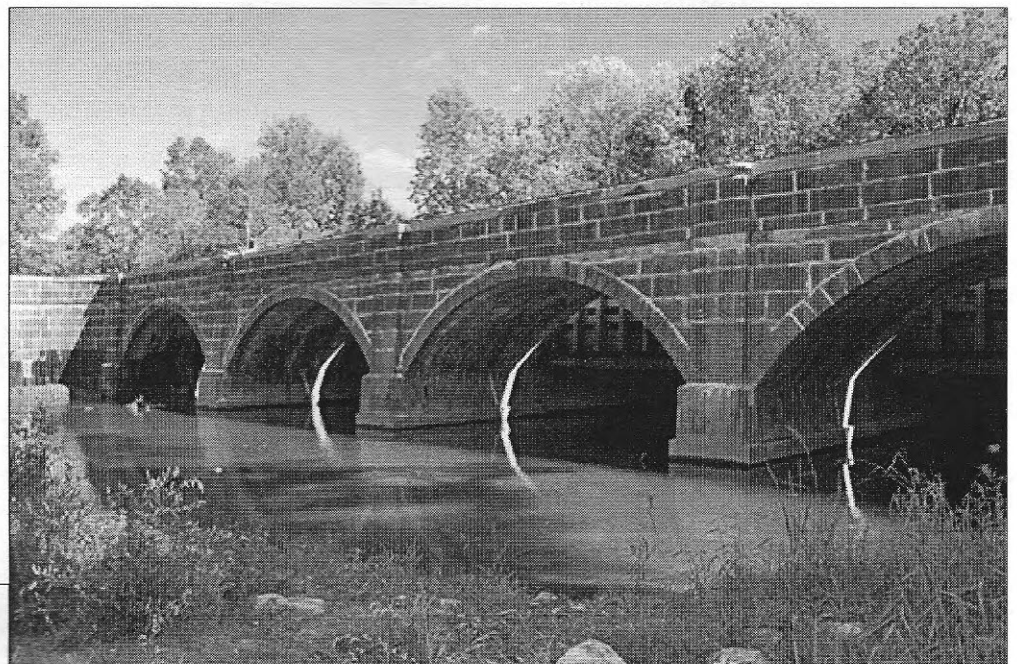
The award was presented at the Preservation League's Annual Meeting and Awards Ceremony in New York City on Thursday, May 12<sup>th</sup> at the historic New York Yacht Club, 37 West 44<sup>th</sup> Street.

"In New York State, the preservation and reuse of our historic buildings is fundamental to the economic revitalization of our cities, towns, and villages. The League's annual awards program allows us to share preservation success stories that may one day serve as inspiration to others," said DiLorenzo. "Each year, we are impressed by the number and variety of laudable nominations, and this year was no exception. We are delighted to present this award for the restoration of the 1844 Nine Mile Creek Aqueduct, and to give the effort the statewide recognition it deserves."

*The Preservation League's Excellence in Historic Preservation awards program is funded by a generous grant from the Arthur F. and Alice E. Adams Foundation of Miami, Florida.*

*By leading a statewide preservation movement, sharing information and expertise and raising a unified voice, the Preservation League of New York State promotes historic preservation as a tool to revitalize our neighborhoods and communities, honor our heritage, and enrich our lives.*

Photo courtesy of the  
Camillus Canal Society



## CHESAPEAKE AND OHIO CANAL TIDBITS

DID YOU KNOW...that the C&O Canal National Historical Park has purchased five new electric boats? ACS Directors Bob and Linda Barth saw the first one in April at Williamsport. For more details on these boats, see the article below.

DID YOU KNOW...that the Paw Paw Tunnel is 3118 feet long and lined with over six million bricks? The ¾-mile long tunnel saved the builders almost six miles of construction along the bends of the Potomac River. It took twelve years to build and was only wide enough for single lane traffic.

DID YOU KNOW... that there are several gold mines in the Great Falls area? The largest is the Maryland Mine located at the intersection of Falls Road and MacArthur Boulevard near Potomac, Maryland. Gold was first discovered here by a Union soldier from Pennsylvania during the Civil War.

DID YOU KNOW...that Lock 72 at milepost 173 is home to the largest natural spring in the eastern United States, or that on rainy days a dramatic waterfall magically appears at the downstream end of the Paw Paw Tunnel? When you visit the Canal Discoveries website, [www.canaltrust/discoveries](http://www.canaltrust/discoveries), you'll find more stories like these, as well as an amazing photo gallery of historical and contemporary images. With links to podcasts and videos, you can explore the canal anytime, from anywhere. It's like having a park ranger at your fingertips!

### C&O CANAL NATIONAL HISTORICAL PARK TO DEBUT ELECTRIC BOATS

The C&O Canal National Historical Park will purchase five electric launches for use on watered areas of the park where a mule-drawn cargo boat or packet boat would not work.

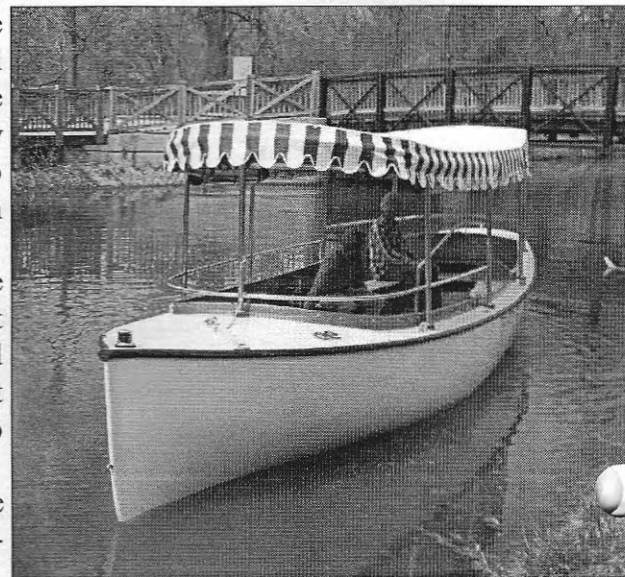
The launches are based on the *Truscott* and similar launches that began to show up along the C&O Canal in the 1890s. They were recreational boats used by their owners on canals and rivers. The historic ones varied in length and beam, and many of them were powered by steam or electricity. These new launches are based on the electric versions.

The new vessels are 30' long and 10' wide. The cost is still being worked out, but it will be about \$150,000. The one at Williamsport is a trial, based on a contract that allows the park to test them first. The first boat, in Williamsport, should be operational by spring 2012. There will be a fee to ride on the boats, but that amount has not yet been determined.

There are larger plans for the Williamsport area of the park that are outlined in an Environmental Assessment that is available at this web site: <http://parkplanning.nps.gov/projectHome.cfm?projectID=18644>. This plan proposes, among other things, to repair Lock 44, make the railroad lift bridge operable, make the Conococheague Aqueduct capable of holding water, and extend the watered section of the canal from above the aqueduct to below the lock. That would create an opportunity for visitors on one of these launches to cross an aqueduct, go under the lift bridge, through a turning basin, and through a lock.

Bill Justice, Chief of Interpretation and Education for the park, says, "I don't know any other canal in this country that offers that level of experience. This is a planning phase, and we don't know when any of these projects could happen. Visit [www.nps.gov/choh](http://www.nps.gov/choh) from time to time to learn more and to make comments when the comment periods open for the EA.

For more information, you can contact Bill at the Chesapeake and Ohio Canal National Historical Park, 301-714-2214; C 301-491-7301; [bill\\_justice@nps.gov](mailto:bill_justice@nps.gov).



## From the President (continued from page one)

was busily rebuilding the aqueduct. Photos are in the photo section of the web site.

Meanwhile in Berlin, Wisconsin, the Berlin Boat Club is actively working to raise funds for the re-gating and return to service of Eureka Lock. This will reconnect the harbor facilities at Berlin to Lake Winnebago. An article on this was in the last *American Canals*. They have many fund-raising events planned for this year.

On the Lower Fox River in Wisconsin, lock and bridge restoration has reached the point that eight of the seventeen locks will be open on summer weekends and holidays, and a few of these will have added operating days. In a few more years, they plan to restore the remainder.

So, despite a slow economy, restoration progress is being made.

## LEESPORT LOCKS IN HISTORIC CANAL SITE

The borough now owns property that was once key to moving coal in the 19th century.

By Mary E. Young, *Reading Eagle*

The history behind the Leesport Lock House has taken nearly two centuries. Settling its future took less than a month after the Leesport Lock House Foundation approached the county with an idea.

Now part of the Berks County Parks System, the lock house that once was a rest stop along the Schuylkill Canal and a residence for the lock tender will soon become the property of the borough for which it's named.

"It's their history," said County Commissioner Kevin S. Barnhardt, who worked out the details on behalf of the county. "Without the lock house, there would be no Leesport. They will have more of a passion to keep it going."

Borough officials and the members of the Leesport Lock House Foundation are thrilled, not only about receiving ownership of the lock house, but about something the county has thrown in with the deal. Barnhardt and commissioners Mark C. Scott and Christian Y. Leinbach approved the purchase of an abandoned carwash on land adjacent to the lock house for \$35,000. On that site remain the walls of the canal, which was filled in with dirt before the carwash was built in the 1950s or 1960s, and a historic marker from the canal. The county will spend another \$10,000 to \$20,000 to have the carwash structure demolished and prepare the property according to plans provided by the foundation, Barnhardt said.

Those plans include removing the asphalt and planting the lot with grass, foundation President Beverly Miller said. "We've had concerns about the (lock) walls for many years," she said. "We've wanted to acquire that property for a long time. We never had the opportunity until now. We have a lot of plans. We're going to expose the tops of the canal walls and fill it with blue flowers to resemble water."

Borough Manager Sandra L. Weiser-Pascavage said the recent vote by borough council to accept ownership of the lock house was unanimous. "It's a historic site in our town," she said. "It's one of the best preserved lock houses along the Schuylkill Canal."

The lock house has always been close to everyone's heart. "It belongs to the Schuylkill River and the canal. We look at it as an asset."

Barnhardt said that if at any point the borough has problems preserving the lock house, ownership will be returned to the county for \$1. The foundation will continue to maintain the property with volunteer labor, as it has since buying the lock house in 1975, Miller said. After restoring it, the foundation gave the lock house to the county in 1992. "It's like we're reverting to 1992,"

Barnhardt said. "We're turning back the hands of time."



Leesport lock tender's house

## CANALENDER

**July 10**—Walk the D&R Canal from East Millstone, NJ, to Blackwells Mills (2.1 miles) or continue to Griggstown (for a total of 5.6 miles). Meet at 10 am at the parking lot in East Millstone, near the old Franklin Used Book Store. Contact Bob Barth, 201-401-3121.

**August 20**—Wharton (NJ) Canal Day. Boat rides, tours, exhibits. For information, contact Bob Barth, 201-401-3121.

**August 21**—Walk the D&R Canal from Griggstown, NJ, to Kingston (5.0 miles). Meet at 10 am at the Griggstown Causeway parking lot. Contact Bob Barth, 201-401-3121.

**September 5 (Labor Day)** - Walk the D&R Canal from Kingston, NJ, to Alexander Road, Princeton (3.8 miles). Meet at 10 am at the Kingston locktender's house. Contact Bob Barth, 201-401-3121.

**September 10**—CCA Annual Walk or Ride Canalport Park, Morris, IL. 8 am-noon. Join the Canal Corridor Association for the I&M Canal Walk or Bike Celebration. Walk one to five miles or bike ten to twenty-five miles during this fun, family event. Bring a group from your business or invite some friends and make it a team effort! Participants receive a 2011 I&M Canal Walk Ride t-shirt. Adult \$20, kids \$10. 815-223-1851; [www.lasallecanalboat.org](http://www.lasallecanalboat.org).

**September 19-24, 2011**—World Canals Conference in the Netherlands provinces of Gronigen, Friesland, Drenthe, and Overijssel. [www.worldcanalsconference2011.nl/home.html](http://www.worldcanalsconference2011.nl/home.html)

**September 23-25, 2011**—Canal Society of Indiana fall trip, "Once on the Blue Moon," a six-hour cruise on the Tennessee River at Chattanooga, TN, passing through locks; Civil War Dinner Theater at Buttonwillow Church at Whitwell, TN; time for tour-

ing battlefields, museums, aquarium, etc. on your own. [indcnal@aol.com](mailto:indcnal@aol.com).

**October 1**—9th Annual Middlesex Canal Bicycle Ride. Meet 9 am at the Middlesex Canal plaque, Sullivan Sq T Sta. Follow the canal route 38 miles to Lowell, and return by train to Boston. Google [canalridecuesheet](http://canalridecuesheet). Snack at Kiwanis Park, Woburn (across canal from Baldwin Mansion, 2 Alfred St); visit the Canal Museum, 71 Faulkner St, N. Billerica. Riders who leave early can take a Lowell line train back to Boston. Middlesex Canal Association, [middlesexcanal.org](http://middlesexcanal.org). Leader Dick Bauer.

**October, 2011**—October 1, 8, 15, 22, 29. The 24<sup>th</sup> annual guided walking tour of all 58.89 miles of the Delaware Canal from Easton to Bristol, Pennsylvania. 12-mile+/- sections. Visit [www.fodc.org](http://www.fodc.org) for full itinerary.

**October 9**—Walk the D&R Canal from Alexander Road, Princeton, NJ, to Carnegie Road (5.5 miles). Meet at 10 am at the Basin parking lot on Alexander Road. Contact Bob Barth, 201-401-3121.

**October 14-16, 2011**—Canal Society of New York State Fall Field Trip, Western Wayne County, with headquarters in Newark. For more details, please visit [www.newyorkcanals.org](http://www.newyorkcanals.org).

**October 16**—Fall Walk. Middlesex Canal, Winchester/Medford. 3-mi. level history walk along canal route to site of Mystic River aqueduct in Medford. 1:30 pm. Meet at Sandy (Shannon) Beach lot at Upper Mystic Lake on Mystic Valley Pkwy., 1.3 mi. N of Rte. 60. Roger Hagopian (781-861-7868 til 10 pm), Robert Winters (617-661-9230; [robert@middlesexcanal.org](mailto:robert@middlesexcanal.org)) or

[www.middlesexcanal.org](http://www.middlesexcanal.org).

**October 21-23, 2011**—Pennsylvania Canal Society tour of the Juniata Division of the Main Line Canal. Contact: Bill Lampert, [indnbll@yahoo.com](mailto:indnbll@yahoo.com).

**October 26, 2011**—National Mule Day. Please check [www.lasallecanalboat.org](http://www.lasallecanalboat.org) for event updates. 815-223-1851.

**November 20, 2011**—Walk the D&R Canal Feeder from the Ellarslie Mansion in Cadwalader Park, Trenton, NJ, to the junction with the main canal at Old Rose St. Meet at 10 am at Ellarslie. Contact Bob Barth, 201-401-3121.

**March 10, 2012**—Canal Society of New York State Winter Meeting and Symposium, Rochester, NY. For details, visit [www.newyorkcanals.org](http://www.newyorkcanals.org).

**April 13-15, 2012**—Canal Society of Indiana 30th Anniversary Tour, headquartered in Batesville, IN. Bus & Whitewater Valley Railroad tour of Whitewater Canal locks and dam (Connersville to Brookville). Visit Whitewater Canal headquarters, Gateway Park, Yellowbank Lock 21, railroad shops and yard. Meals at historic Laurel Hotel and Sherman House. Teddy Roosevelt re-enactor on NY and Panama canals. Contact [indcanal@aol.com](mailto:indcanal@aol.com).

**May 4-6, 2012**—Virginia Canals & Navigations Society Annual Canal Conference, Covington, VA. Contact: Phil de Vos, [phipfox@yahoo.com](mailto:phipfox@yahoo.com).

**June, 2012**—The American Canal Society and Canadian Canal Society's Historic Canals Conference, Hamilton, Ontario. to examine the Desjardins Canal (which will be celebrating its 175th anniversary), the Burlington Ship Canal, and Hamilton Harbour and its environs. Contact Bob Sears, 416-285-7254; [dawnofdes-tiny@sympatico.ca](mailto:dawnofdes-tiny@sympatico.ca)