

# AMERICAN CANALS

BULLETIN OF  
THE AMERICAN CANAL SOCIETY

BULLETIN NUMBER 28

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

FEBRUARY 1979

## PRESIDENT'S MESSAGE

In recent months we have had several inquiries concerning possible "Life Membership" in the American Canal Society. Apparently some of our members would prefer a "one-shot" dues payment instead of being repeatedly billed for dues, year after year with the inevitable dues increases. For the benefit of these individuals, and other ACS Members who may wish to consider this method of advance dues payment, your officers have decided to add an ACS LIFE MEMBERSHIP category to our various membership classifications.

The one-time dues payment for Life Membership will be fixed (this year) at \$100. With our rapidly deflating dollar, we feel this offers our members an attractive small investment possibility for the future. (Ten years from now, we may find it necessary to re-set this figure at \$200!) Once paid, this \$100 fee will guarantee you a permanent place on our mailing list, no further dues payments, and the automatic title of "Canal Boat Captain". Other special privileges may be granted ACS Life Members in the future, as they may well become the "backbone" of our organization!

Any ACS members who are interested in changing their membership to the "Life" category are invited to write for further information, or to simply send a \$100 check to Charles Derr, our Secretary-Treasurer, who will put you on our permanent mailing list, and issue you a special LIFE MEMBERSHIP card, as well as an "acknowledgement" for income tax purposes.

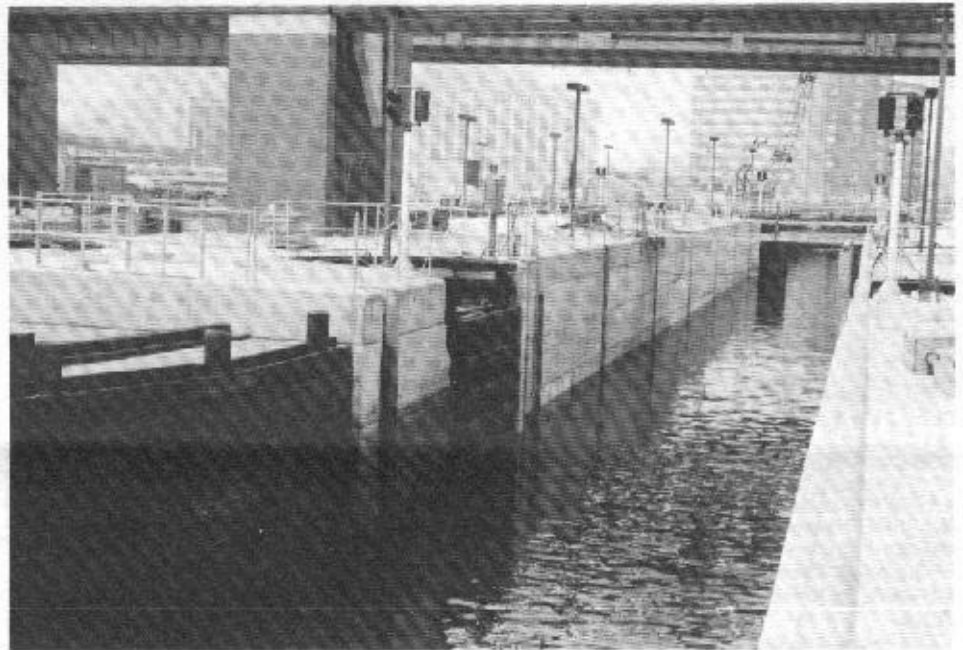
Bill Shank

## ACS DIRECTOR CAHILL HONORED

Louis J. Cahill, Canadian Director of the American Canal Society, was recently honored by fellow members of his profession of public relations when he was presented with the Canadian Public Relations Society's Award of Attainment for "distinguished achievement and service". We are proud to count Mr. Cahill among the directors of the American Canal Society.

Lou Cahill is currently very involved in plans for the 150th Anniversary of the first Welland Canal - 1829.

## Charles River Dam and Locks



Commercial lock on the James River, 300' x 40', the only one open to navigation in August 1978, when this photo was made.

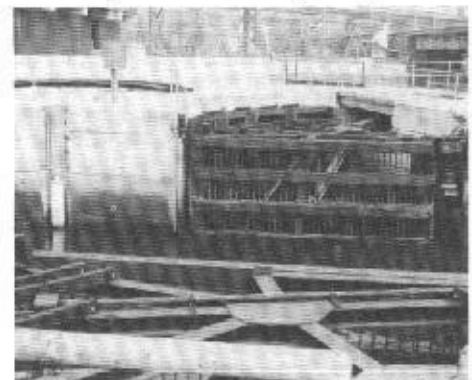
The new Charles River Dam is a multi-purpose facility with provisions for flood control and recreational and commercial navigation. It is located in Boston inner harbor on the site of the former Warren Avenue Bridge which linked Boston and Charlestown.

The major features under construction are the pumping station, the navigational locks, and an overhead enclosed walkway. The walkway connects free standing stair towers and the pump station with the three navigation locks and contains the control stations for operating the locks. At the south terminus of the walkway is the MDC police boat facility. An on-grade crossing of the locks has been provided for pedestrian traffic between Boston and Charlestown.

The design and construction of the project was under the supervision of the U.S. Army Corps of Engineers in cooperation with the Metropolitan District Commission who will operate and maintain the facility. The project was designed by the architect-engineer firm of CE Maguire, Inc., Waltham, Massachusetts. It was constructed by J. F. White Contracting Co. of Newton, Massachusetts, under a \$34,957,250 contract. Construction began in September 1972 with removal of the abandoned Warren Avenue Bridge under a separate contract.

The dominating project feature is the large pumping station (see photo on page two) which is 190 feet long, 85 feet wide and 60 feet high. This building houses six vertical lift pumps, each capable of discharging 630,000 gallons of water per minute. Each pump is driven by a 3,000

(Concluded on Page Two)



Sector type gates to be used on all three locks, during construction in August of 1978.

# American Canals

BULLETIN OF THE AMERICAN CANAL SOCIETY

"DEDICATED TO HISTORIC CANAL RESEARCH, PRESERVATION AND PARKS"

AMERICAN CANALS is issued quarterly by the American Canal Society, Incorporated. Objectives of the Society are to encourage the preservation, restoration, interpretation and use of the historic navigational canals of the Americas; to save threatened canals; and to provide an exchange of canal information.

Annual subscription to "AMERICAN CANALS" is automatic with a minimum ACS dues payment of \$8.00. Individual copies may be purchased at \$2.00.

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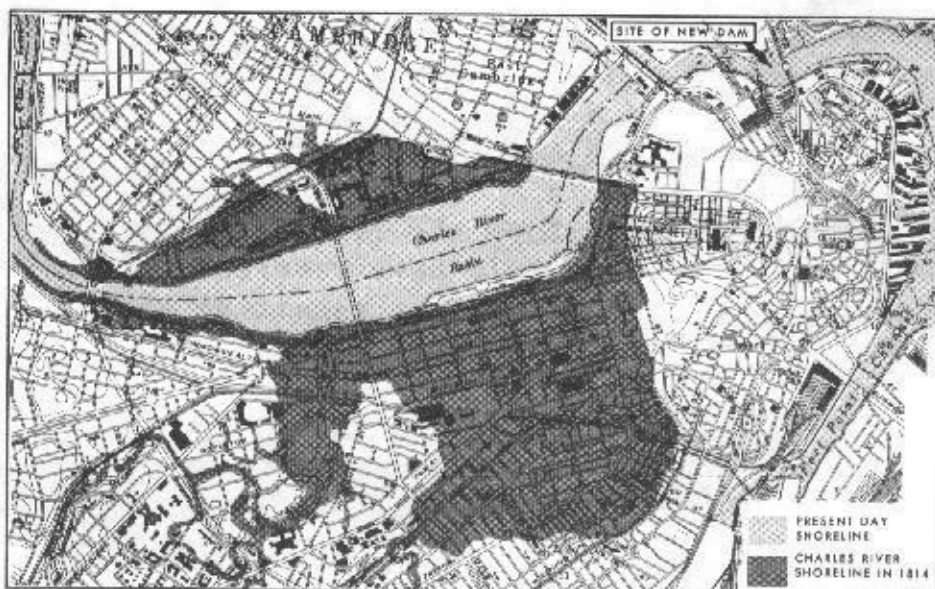
Chairman, Canal Parks Committee, Dr. William E. Trout, III., 1932 Cinco Robles Drive, Duarte, CA 91010.

## EDITOR'S CORNER

Thanks to the majority of the members of the American Canal Society who accepted the dues increase, we are able to go into a 12-page edition with this issue. As all the returns are not yet in, we do not yet know how many issues per year we can afford with twelve pages, but we are hoping that we can find the means to keep it up. (But, no promises at this point.) It has always seemed that with coverage of all the canals in North America plus a sprinkling of those of other parts of the world, canals threatened or to be restored, news of the various canal-related organizations, etc., there was never enough room to cover all the interesting things which I would like to have included. If we can sustain the larger issues, I have many good items in store for you, so help keep the possibility open by letting your friends and others interested in the history and status and future of canals know of the American Canal Society. Our Secretary-Treasurer, Charles Derr, would be glad to supply a sample copy to anyone that you would suggest.

Tom Hahn, Editor

## Charles River Dam and Locks

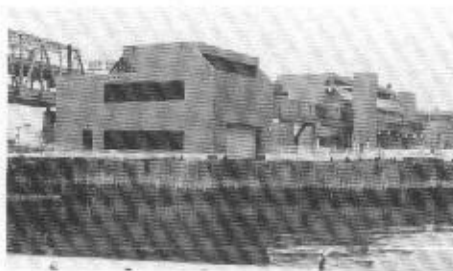


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horsepower diesel engine. Offices, personnel rooms, workshops, control rooms, and a public viewing area overlooking the engine room and navigation locks are located on the harbor side of the station shown in the photo. Arched openings (hidden from view in the photo) constructed above the downstream discharge bays and the upstream engine room windows reflect the character of the Charles River with its many arched bridges.

The existing single navigation lock at the old dam operates at capacity. To accommodate the increasing boat traffic between the harbor and the Charles Basin, the new project has three locks. Two locks, for recreational traffic, are 200 feet long and 22 feet wide, and the third, primarily for commercial traffic, is 300 feet long and 40 feet wide. This lock is also used for recreational boat traffic during the peak traffic periods. All locks feature sector gates for rapid lock operation. A major improvement in the navigation locks is the capability for discharging salt water, which enters the lock during operation, always into the harbor. At capacity these locks will handle some 40,000 boat passages per year, almost triple that at the old lock. Dual control consoles are located in the overhead walkway and on the lock walls for efficient gate operations.

The Paul Revere Landing Park on the Charles-town shore features tree lined walks, waterfront benches, and grassed areas. Contiguous to the park is a plaza framed by the pumping station and a large free standing stair tower containing the public entrance to the facility. Next to the stair tower is a cantilevered platform which overlooks the inner harbor, the fishway entrance, and the pump discharge bays.



View of the Charles River Pumping Station, from the Boston side, looking northwest.

The public viewing area extends along the entire fishway. Located at the basin end of the fishway is a special area for the public to view fish passage.

A cantilevered public access walkway extends from the upstream fishway end to the large commercial lock. The public access walkway continues across the lock gates and terminates on the Boston shore where a landscaped public parking area for 90 cars is provided.

(Submitted by Alden Gould, Director ACS. Photos by Gould. Text and map from a Corps of Engineers brochure.)

## WELLAND CANAL MAPS AND PLANS

The St. Catharines Historical Museum has a considerable number of fine maps and plans, many of which come from the old Welland Canal offices. These, along with about 200 copies of maps from The Public Archives collection in Ottawa, mostly relating to the canals, make up a comprehensive collection for research purposes. To aid such research in the future it is necessary to have a cataloguing system whereby the maps are easily retrievable. With money made available from Canada Works for the 150th Anniversary of the Welland Canals, a system is being devised to catalogue in detail as much information as possible about each map. This information will be recorded on cards and placed in order according to the date on the map. Two cross indices will also be created, one by location along the canal, and the other indicated by the 1st, 2nd, 3rd or 4th Canal. Hopefully such a system will aid the researcher while at the same time reduce excessive handling of fragile maps.

Time is also being given to the conservation of these artifacts so that they can be maintained in good condition. One map of the 1st Canal has already been sent to Montreal for extensive renovation.

For further information write to: St. Catharines Historical Museum, 343 Merritt St., St. Catharines, Ontario L2T 1K7, Canada.

# An Early Trip On The Erie Canal

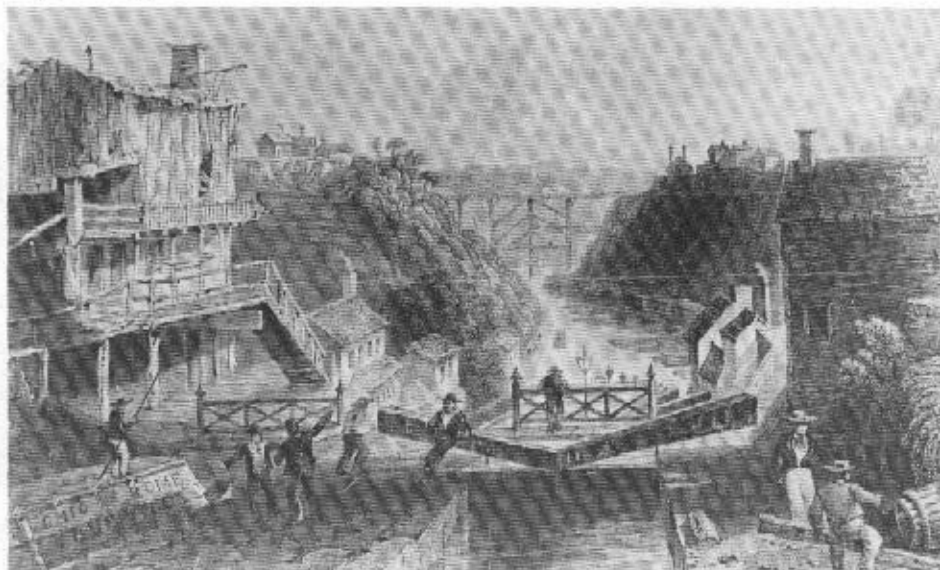
by Ernest H. Schell

The greatest monument to American enterprise in the early nineteenth century was the **Erie Canal**, the longest canal in the world in its day, a 364-mile giant over ten times as long as any canal previously built in the United States. It was a stupendous engineering feat undertaken by ingenious and dedicated amateurs working scientifically and systematically on a project that many people had considered a certain failure.

A host of visionaries had for decades promoted schemes that would link the Hudson River with the Great Lakes, but the bankruptcy of the Western Inland Lock and Navigation Company in 1808, after a disappointing 17-year history of marginally useful ventures, discouraged many of the state's leading merchants and speculators from investing in canal stock. While businessmen in New York City saw the value of having their town serve as the gateway to the West, they did not believe that a successful canal could be completed in their lifetime. Even DeWitt Clinton, the forty-one year old mayor of the city, when he was appointed to the New York State Canal Commission in 1810, was not enthusiastic about the prospects of the project. He had long recognized the value of a link with the West, however, and after the War of 1812 became the canal's leading promoter.

When construction of the Erie Canal was finally authorized in April, 1817, Clinton and the other Commissioners knew that to win over support from a wary public, and particularly from the financial community, a modest but successful beginning was preferable to failure on a spectacular scale. Accordingly, the canal was divided into three parts, with work on the middle section from the Seneca River to Utica to be completed by 1820. Under the direction of Judge Benjamin Wright, often considered the "father of American engineering," work proceeded on schedule, with Wright supervising the application of new equipment and innovative techniques in land-clearing, blasting, and construction.

Though foul weather damaged part of the uncompleted canal in the spring of 1819, and malaria and typhoid took their toll, all doubts about the project were dispelled by October, when a portion of the middle section from Rome to Utica was opened for traffic. On the 22nd, Clinton, now the governor of the state, embarked



An old print, looking down one of the two flights of locks on the Erie Canal at Lockport, New York. (Courtesy George Wills)

at Rome on a 60-foot long canalboat named **Chief Engineer of Rome**, in honor of Wright, leading a company of dignitaries who set off on the trip to Utica amid the pealing of bells, the salute of cannon, and the enthusiastic cheers of thousands who lined the canal banks to witness the great event. Investors were suddenly bullish about "Clinton's Ditch," vindicating the Commissioners' decision to bank on early signs of progress in winning the support necessary to complete the canal.

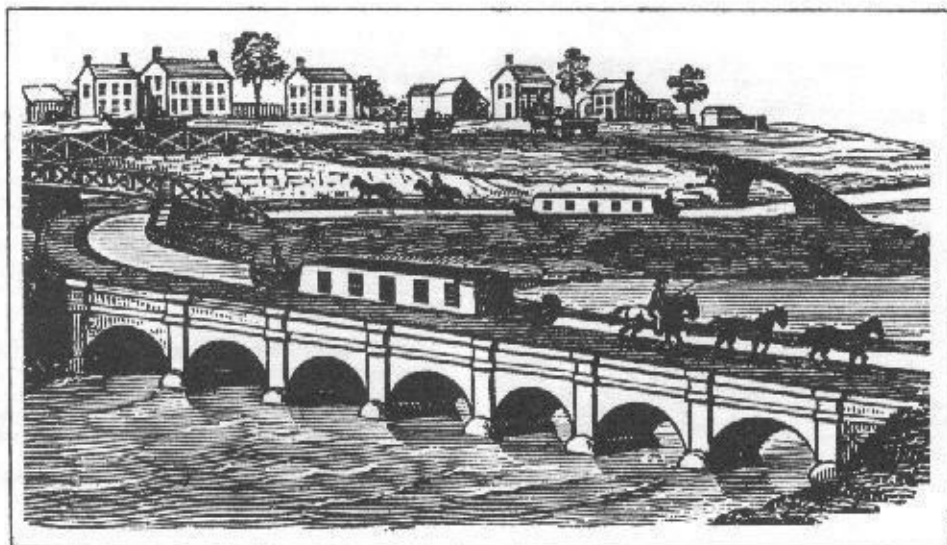
When the finished canal was opened with the famous "Great Pageant" in October, 1825, the attention of the entire country was focused on the event. By then, though, canal mania already had the country in its grip. Investment in the Erie had not only proven sound, but had been encouraged by the continued care with which the Commissioners had continued to promote their efforts. Had it not been for these early and elaborate celebrations, the "Great Pageant" itself might never have taken place.

April 21, 1820, opening day for the entire middle section, for example, was as dramatically

staged as the fanfare that had accompanied the opening of the Rome-to-Utica leg the previous October. The **Lion of the West**, a 76-foot boat with a 4-foot beam, left Rochester early in the morning with its contingent of the illustrious, laid over at Lyons that evening, and arrived in Utica the following day, having made the trip with an average speed of five miles an hour. Since wash from the boat had caused part of the bank to crumble along with way, a speed limit of four miles an hour was imposed to try to solve the problem. Otherwise, everything went as well as the Commissioners had prayed it would. On the 4th of July, an international exhibition at Syracuse commemorated the completion of what had already proven to be a resoundingly successful venture. The opening of the first commercially significant portion of the Erie Canal had become the most talked about event of the day.

The middle section was immediately put into use carrying freight and passengers. A ride on the canal, in fact, was considered high adventure for travellers, who could return home boasting of their experience. One of the passengers that first summer was a Philadelphia merchant, Thomas Pym Cope, on his way from Philadelphia to see Niagara Falls. Cope, civic leader who was later to become interested in several of Pennsylvania's internal improvements, was a meticulous observer of the world who for many years kept a diary of his daily rounds. Two passages from this journal, recently edited by Eliza Cope Harrison (**Philadelphia Merchant: The Diary of Thomas P. Cope, 1800-1851** [South Bend, Indiana: Gateway Editions, Ltd., 1978, \$19.95]), recount the trip he took on the newly-opened middle division.

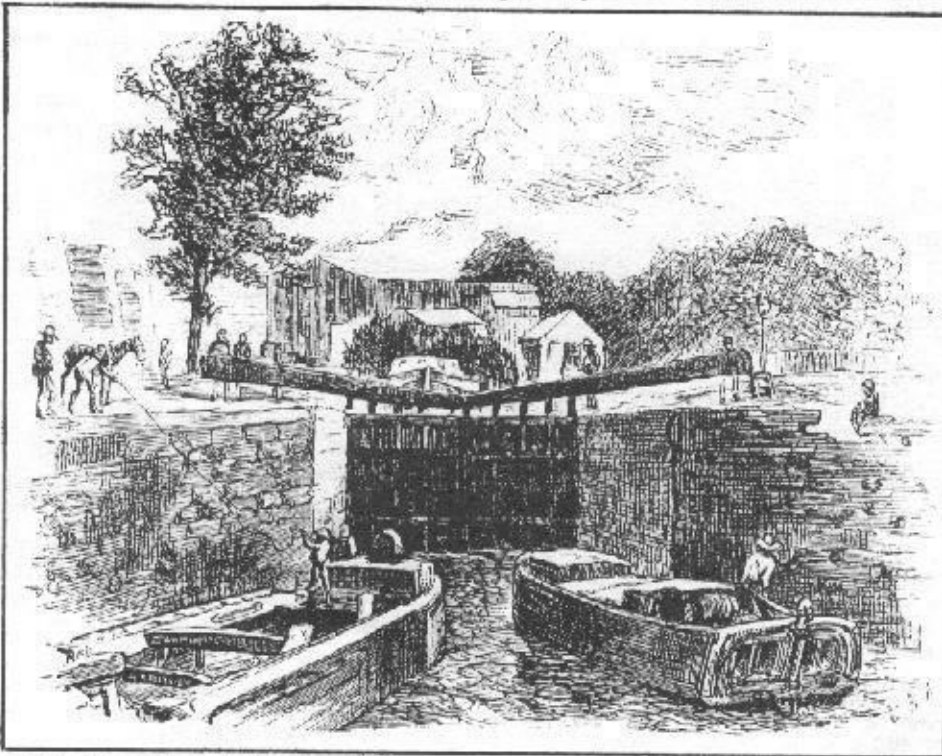
For some reason, Cope's trip terminated at Montezuma, near the Seneca River, which was in fact the officially designated western end of the middle division, although the canal had been open earlier in the month as far west as Rochester, and a Utica newspaper announced that on July 25, three days before Cope's journey, packet service was to have begun between Utica and Rochester. Unlike the inaugural voyage of the **Lion of the West**, Cope's canal sojourn continued through the night, a practice that became standard procedure, but one that could be dangerous, as Cope noted. There were other dangers, such as falling trees in stormy weather, that Cope noted as well. His account, repro-



An aqueduct on the old Erie Canal, circa 1865-Hornung. (Early American Advertising Art)

(Concluded on Page Four)

## An Early Trip On The Erie Canal (Cont.)



Sketch of the entrance lock to the old Erie Canal at Troy, New York, circa 1870. (Courtesy Canal Society of New York State.)

(Concluded from Page Three)

duced in full with the permission of the publisher (Regnery/Gateway, Inc., South Bend, Indiana) offers a detailed and fascinating glimpse of the very early and exciting days on the Erie Canal.

"July 28, 1820: At 9 this morning we went on board the passenger boat **Montezuma**, Capt'n. Brown, on the great canal finished from Utica [where Cope's journey began] to Montezuma, distance of 96 mi. This boat is 75 feet in length, 12 beam and draws 20 inches of water. Capt'n. B. has \$18 per mo. and says that for weeks he has not had 3 hours regular sleep at one time. This is hard duty for such wages. The boy who drives the horses has \$10 per month. Today he is to drive 50 miles and must return tomorrow.

"Our boat is towed by tow horses attached to a line 110 feet long. Chains are not permitted, on account of their tearing away at the banks. There is but one tow path & when two boats meet, the one going to market stops & dropping her line, the other passes over it. Passenger boats pay 5 cents a mile, country produce one cent per 100 lbs., and dry good 2 cents. The bridges over the canal, of which we are told there are 70 between Utica and Montezuma, are so contracted as to leave barely room for our boat, the abutments projecting too far into the canal.

"Captain B. is sick with the fever and ague and says all the lads in their employ on the canal - the one who now drives our horses excepted - have the same disorder. It is an unpleasant omen.

"One of our company has amused himself with hooking bullfrogs, which are numerous and display themselves in great stile on the banks. We have had a mess of them for dinner and deem the flesh not inferior to that of a chicken. The banks of the canal are falling in some places, owing to their having been made too steep. This error, however, they appear to have corrected.

"July 29: We made no stop at Manlius, which we passed late at night, just previous to which the

Boy, getting asleep, fell from the horse and luckily was not much injured, but it was so dark that the accident was perceived only from the fright of the horses. There had been a heavy storm of wind and rain, accompanied by thunder, the **Oneida Chief**, another passage boat, bound to Utica, passed us some hours afterwards and reported that she was near being destroyed by the falling trees - indeed, the danger was considerable. About daylight this morning, we arrived at the first locks, 3 in number; they descend together 27 ft. to the west. Halted for half an hour at Syracuse, 61 miles from Utica - a village of 20 houses on the north side of the Canal.

"We were much too crowded last night. Captain B. says he can accommodate 10 or 12 passengers with comfort and does not wish more, whereas there are 21 of us. The women occupied all the berths and the men spread themselves on settees and on the floor and were said



Sketch of an Erie Canal Boat cabin interior, circa 1860. (Courtesy Canal Society of New York State.)

to have fared better than their fair companions, who complain of having been annoyed by vermin. Alfred [Cope's son], who slept on the floor, got up with one arm much swollen and inflamed, apparently from the bite of some insect.

"We reached Montezuma before twilight, 96 miles from Utica and have been 33 hours in coming that distance and therefore travelled at a rate less than 3 miles an hour. We had 4 meals on board and for these and passage paid \$4 each. It has been a listless, dull voyage - the novelty alone rendering it tolerable. None of our company probably regret having taken it, but none, I believe, would be willing to renew the trip."

(Mr. Schell, a freelance writer and business historian, is a doctoral candidate in history at Temple University.)

## 1979 Dues

We are pleased to report that, as of this writing, more than eighty percent of our members have responded to our 1979 dues statement, mailed last November, and have paid their dues for the current year. However, there are still approximately one hundred members who are being reminded once more by Charlie Derr, our Secretary, in a separate mailing, that they have somehow neglected to send him a check. (This does not include new members who have joined our ranks since October 1, 1978 and whose membership continues through 1979)

Mailing list operations and postage costs being what they are, we cannot afford to carry non-dues-paying individuals indefinitely. If you have received a separate "reminder" from Charlie Derr, we urge you to take care of this matter promptly. Otherwise, your name will be removed from our mailing list before the issuance of the May 1979 **AMERICAN CANALS**.

## Florida Barge Canal Appeal

Attorneys for the state say they plan to appeal a district-court ruling that could have far-reaching implications for the disposition of land acquired for construction of the ill-fated Cross-Florida Barge Canal.

The appeals court gave canal backers three more years to begin development of the waterway - or sell 1700 acres of Marion County land to the Ocala Manufacturing Co. at the land's 1968 purchase price. Ocala Manufacturing Co. sold the land to the Canal Authority in 1968, contingent on a promise that construction of the Eureka Pool would enhance the value of approximately 4000 acres of adjoining land still owned by Ocala Manufacturing.

Ocala Manufacturing brought suit against the Canal Authority after the canal construction was halted during the Nixon administration because of environmental concerns. Circuit Judge Wallace Sturgis ruled in 1977 that if the Eureka Pool and the Yankeetown-to-Palatka canal are not developed by Sept. 28, 1981 the Canal Authority must sell the land back to Ocala Manufacturing for \$395,848.

(Submitted by ACS Director Alden Gould from Fort Myers News Press)

# Early Canal Boats on the James River and Kanawha Canal

by T. Gibson Hobbs, Jr.

(Part three - Conclusion)

The listing of canal boats titled "CANAL REGISTER" first appears in the August 9, 1841 issue of the Lynchburg Virginia Newspapers and is continued in most of the issues thereafter. These list the name of the boat followed by the name of the captain.

The listings below are continued from "part two" of this series and are reproduced just as they appear, including the misspellings, errors and typographical mistakes, plus possibly some of my own.

ARRIVED - Oct. 18 - Kanawha, Jenks; Old Virginia, Taylor; Jack Downing, Murrill; Jno. Randolph, Crumpecker; Wm. L. Lancaster, Harrington.

Oct. 19 - Abingdon, Dolan; Jos. C. Cabell, Doughty; Josephine, Orbeson; Davy Crockett, Phelps; Highlander, Locket; Columbia, Harrington; Buchanan, Peters; Experiment, Goodwin; Flying Lucy, Staton.

Oct. 20 - Lynchburg, Fields; Pioneer, Pellet; Claytor & Burton, Ash.

CLEARED - Oct. 15 - Lady of the Lake, O'Connor; Union, Jenks; James Madison, Peters; Farmer, Couch.

Oct. 16 - Genl. Harrison, Clarke.

Oct. 19 - Tennessee, Baily; Wm. L. Lancaster, Harrington.

ARRIVED - Oct. 22nd - Old Dominion, Childress.

CLEARED - Oct. 21st - Experiment, Goodwin.

Oct. 22nd - Old Virginia, Taylor; Buchanan, Armsworthy; Highlander, Locket; Josephine, Orbeson; Old Dominion, Childress.

ARRIVED - 25th - Pocahontas, Grant; Red Bird, Brown.

26th - Commerce, Brown.

27th - Richmond, Eubank.

CLEARED - 25th - Columbia, Deviny.

26th - Clayton & Burton, Ash; Jno. Randolph, Crumpecker.

27th - Lynchburg, Fields.

ARRIVED - Oct. 29th - James Madison, Peters; Gen'l. Harrison, Clark.

Oct 30th - Tennessee, Baily; Wm. L. Lancaster, Harrington.

CLEARED - Oct. 28th - Red Bird, Brown; Davy Crockett, Phelps.

Oct. 30th - Richmond, Eubank.

ARRIVED - Nov. 1st - Gabriel Tar, Pamplin; Buchanan, Armsworthy.

Nov. 3rd - Old Dominion, Childress; Jos. C. Cabell, Doughty; Lady of the Lake, O'Connor; Mohawk, Quarles.

CLEARED - Oct. 30th - Jas. Madison, Peters.

Nov. 1st - Gabriel Tar, Pamplin

Nov. 2nd - Gen. Harrison, Clark; Wm. L. Lancaster, Harrington.

Nov. 3rd - Farmer, Couch; Tennessee, Baily.

ARRIVED - Columbia, Deviny

CLEARED - Nov. 4 - J. C. Cabell, Doughty; Highlander, Fourqurean.

Nov. 6 - Buchanan, Armsworthy; Mohawk, Quarles; Old Dominion, Childress.

ARRIVED - Nov. 9th - Pocahontas, Grant.

Nov. 10th - Jas. Madison, Peters; Richmond, Eubank.

CLEARED - Nov. 8th - Elizabeth, Roberts; Lady of the Lake, O'Connor.

Nov. 9th - Experiment, Goodwin; Red Bird, Brown; Josephine, Orbeson; Lynchburg, Fields; Columbia, Deviny; Abingdon, Dolan.

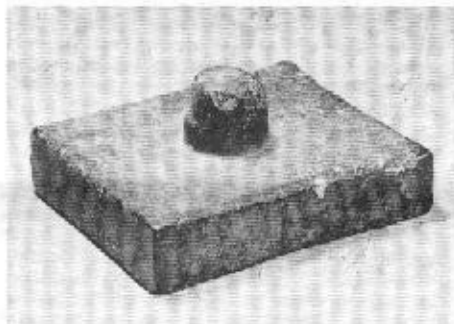
ARRIVED - Nov. 12th - David Crockett, Phelps; Pioneer, Pellet.

Nov. 13th - Gen'l. Harrison, Clark.

CLEARED - Nov. 12th - Pocahontas, Grant; John Randolph, Crump.



The accompanying photographs of James River and Kanawha Canal artifacts were received recently via ACS Member T. Gibson Hobbs, Jr. of Lynchburg, Virginia from Saunders Guarrant of Roanoke, Virginia. The upper photograph shows a JR & K canal boat horn being blown by Mr. Guarrant. The other is a piece of iron 9 x 7½ inches and 2 inches thick, weighing 20 to 25 pounds and identified by Gibson Hobbs as a hinge post. [This is probably the device upon which the heel post of a lock gate rested. The hinge post (or gudgeon plate and pivot pin as it is also called) was designed to fit snugly (yet smoothly) into the thrust bearing (sometimes historically called a hollow cast iron quoin) of the heel post. Ed.



Nov. 13th - Richmond, Eubank; Jas. Madison, Peters.

ARRIVED - Nov. 15 - Claytor & Burton, Ash; Tennessee, Bailey.

15 - Wm. L. Lancaster, Harrington; Highlander, Fourqurean.

CLEARED - Nov. 16 - Pioneer, Pellet; Gen'l. Harrison, Clarke; Old Virginia, Taylor.

ARRIVED - Nov. 17 - Jos. C. Cabell, Pryor.

Nov. 19 - Red Bird, Brown; Lynchburg, Fields.

Nov. 20 - Josephine, Orbeson.

CLEARED - Nov. 18 - Highlander, Locket; Tennessee, Bailey.

Nov. 19 - Jos. C. Cabell, Dolan.

ARRIVED - Nov. 20 - Gabriel Tarr, Overton.

Nov. 22 - Mohawk, Quarles.

Nov. 23 - Richmond, Eubank; Columbia, Deviny.

Nov. 24 - Jno. Randolph, Crumpecker; Abingdon, Pryor; Old Dominion, Childress.

CLEARED - Nov. 20 - Josephine, Orbeson.

Nov. 22 - Wm. L. Lancaster, Harrington.

Nov. 23 - Lynchburg, Fields; Gabriel Tarr, Overton; Red Bird, Brown.

ARRIVED - Nov. 24 - Gen. Harrison, Clark.

CLEARED - Nov. 24 - Columbia, Deviny; Pig Iron, Trent; Old Dominion, Childress.

Nov. 25 - Buchanan, Armsworthy; Richmond, Eubank.

Nov. 26 - Farmer, Couch; Clayton & Burton, Ash.

ARRIVED - Nov. 29 - Pioneer, Pellet.

Nov. 30 - Elizabeth, Roberts.

Dec. 1 - Jas. Madison, Peters.

CLEARED - Nov. 27 - Mohawk, Quarles.

Nov. 27 - Gen. Harrison, Clark.

Nov. 29 - Abingdon, Dolan.

Dec. 1 - Jas. Madison, Peters.

ARRIVED - Dec. 4 - Highlander, Lockett.

CLEARED - Dec. 3 - Pioneer, Pellet.

Dec. 4 - Kanawha, Snediker.

ARRIVED - Dec. 6 - Red Bird, Brown.

Dec. 7 - Buchanan, Armsworthy; Lynchburg, Fields; Richmond, Eubank.

CLEARED - Dec. 6 - Experiment, Goodwin.

Dec. 7 - Highlander, Locket; Jas. Madison, Peters.

Dec. 13, 1841 - No Canal Register included

ARRIVED - Dec. 13 - Old Dominion, Childress; Pig Iron, Trent.

Dec. 14 - Gen. Harrison, Clark; Mohawk, Quarles; Jones, Nelson.

CLEARED - Dec. 11 - Buchanan, Armsworthy; Old Virginia, Taylor.

ARRIVED - Dec. 15 - Farmer, Capt. Crouch.

Dec. 17 - Abingdon, Capt. Crumpecker.

Dec. 18 - Pioneer, Capt. Pellet.

CLEARED - Dec. 15 - Pig Iron, Capt. Dixon.

Dec. 16 - Columbia, Capt. Deviny; Gen'l. Harrison, Capt. Clark; Gabriel Tar, Capt. Shaw.

Dec. 17 - Mohawk, Capt. Quarles.

## 1979 CANAL CALENDAR

Mar. 9 - "Towpath Trail" slide show by Canal Society of New Jersey at 8 P.M., Allied Chemical Auditorium, Morris Township, NJ.

April 15-28 - Hike along entire 184½-mile Chesapeake & Ohio Canal. C & O Canal Association, Ms. M. E. Johns, 6233 16th Road NW, Arlington, Va. 22205.

April 20 - "Restoration of Canals in England" and preview of planned D & H Canal trip, CSNJ, 8:00 P.M., Allied Chem. Aud., Morris Township, NJ.

April 27-29 - Delaware & Hudson Canal bus trip to Kingston, D & K Museum at High Falls, locks, aqueducts, DePuy House, movie "Canawler," two dinners. CSNJ, MacCulloch Hall, Box 737, Morristown, NJ 07960.

May 5 - Canal Society of Ohio, Ohio & Erie Canal Tour, Carroll to Newark including Baltimore, Buckeye Lake, Deep Cut, Barnett Golding, 111 Richards Road, Columbus, Ohio, 43214, Chairman.

May 18-20 - Pennsylvania Canal Society, Lehigh Coal & Navigation Tour, John P. Miller, 3520 Quincey Lane, Hanover Farms, Bethlehem, Pa. 18017.

Aug. 17-19 - Roscoe Village Canal Festival, Roscoe Village Society, 381 Hill St., Coshocton, Ohio 43812.

Oct. 12-14 - Bus Tour of the Sandy & Beaver Canal, HQ Salem, OH. Canal Society of Ohio & Pennsylvania Canal Society, Jack Lanham, 235 Windsor Dr., East Liverpool, OH 43920.

(Canal organizations please note. Send information regarding your events for American Canals by 1 January, 1 April, 1 July, and 1 October; Editor Tom Hahn, American Canals, Box 310, Shepherdstown, WV 25443.)

ACS Member Don Ramsay asks: "Is there any etymological relation between **lock** (as in canals) and the Scottish **loch**? Though both represent an impoundment of water, **Loch** comes from Gaelic/Old Irish and **lock** seems to come from Germanic sources. On the other hand, the Celts were more widespread than we used to think, according to a recent NATIONAL GEOGRAPHIC; so maybe there is a remote connection." [Any comment? Ed.]



"Groundbreaking" for the Rocky Flats Canal (Valles Vikingis) - the first modern canal on Mars! Actually, what we see here is a trench dug on July 28, 1976 by the Viking 1 surface-sampler (lower portion of photo). Lumpy piles of material in the trench were left by the sampler backhoe. Area around the trench has ripple marks produced by the Martian wind. (NASA Photo.)

During the summer of 1877, while Mars was on one of its periodic swings relatively close to the earth, the Italian astronomer Giovanni Virginio Schiaparelli made the first extensive map of the fabled Red Planet, and started the Planet Earth on a wild adventure from which it has still not fully recovered. What Schiaparelli saw was a network of straight lines, some of them thousands of miles long, covering the planetary surface. He called them "canali," or channels, a noncommittal term already used by other astronomers, but when the English translated it into "canals" the public imagination was captured and there was no more doubt that Mars was, or once was, an inhabited world. At that time, canal transportation networks were commonplace on Earth and a new Canal Era was beginning, with a great ship canal across the isthmus of Suez, one in the works across Panama, and huge reclamation projects underway in the western U.S. A more advanced civilization than ours would, of course, have an even more extensive canal network, and that on Mars covered the entire planet.

Other astronomers (but not all) also could see Schiaparelli's canals, but the most notable was Percival Lowell, a wealthy New England businessman who turned to astronomy and after a systematic worldwide search for the best location, built his own observatory in 1894 in Flagstaff, Arizona, for the express purpose of studying Mars. His story is a dramatic one, well told in **LOWELL AND MARS** by William Graves Hoyt of the Lowell Observatory (U. Arizona Press, Tucson, 1976, cloth \$13.95, paper \$8.50) which is highly recommended for further reading. Lowell caught the public's attention, and his experiments and conclusions were logical: the canal network was not what one would expect from natural cracks or fissures (take a look at the

crackle on pottery, and a drying mud flat) but was arranged like railway, road and canal networks on Earth, with points of convergence he called "oases." Since the canals on Mars were so long and straight - some at least 3,000 miles long - it was clear that unlike Earth, Mars had a unified planetary government far more advanced than ours. Perhaps this huge network was the last great engineering feat of a dying civilization trying to gather scarce water from the polar caps to irrigate a drying planet. Who knows, perhaps we Earthlings were really Martians, having left our dead planet aeons ago? However, the visibility of the canals changed with the Martian seasons, and there were indications that the system was still under construction because over the years of observation, new canals appeared which had clearly not been there before. Lowell also supplemented his astronomical observations with terrestrial experiments. For example, by observing piano-wires strung out across the horizon a mile away from his telescope, Lowell estimated that the smallest lines one should be able to see on Mars had to be at least a mile wide, so the "canals" must actually be wide irrigated regions, not just long Suez canals as many people assumed. Lowell even took his honeymoon in a balloon a mile over London, to see what the criss-crossing paths in Hyde Park looked like from a great distance! Anyone who reads Lowell's books such as **MARS AND ITS CANALS** (1906) or **MARS AS THE ABODE OF LIFE** (1909) cannot help but be impressed with the logic and thoroughness of his experiments and observations, and the logical conclusions drawn from them.

Unfortunately, in science the path to the truth is frequently not a straight one. Lowell was every bit as good as Sherlock Holmes but his basic premise was in error. We know now from the dramatic close-up photos of Mars by NASA's MARINER and VIKING that there is not, and never has been, any canal network on Mars such as Lowell saw. There is no doubt that Schiaparelli, Lowell and others saw lines criss-crossing Mars, but they were not related to linear surface features, and must have been illusions created by irregularities in albedo in a way not yet understood. On a tiny image seen through the earth's atmosphere, at the limits of vision, the mind can play tricks. Exobiologist Carl Sagan (himself a product of the Martian Canal Era) compared the canal map with the MARINER photographs in a 1975 article in **ICARUS** and found little correlation. Understanding Lowell's observations will tell us a lot about both Mars and the human brain, but alas, not much about intelligent life on our sister planet, or about extraterrestrial canals.

One canal - Agathodaemon, or Coprates, a wide canal which Lowell knew was different from the other narrow lines - did in fact turn out to be a remarkably straight surface feature 3,100 miles long and 250 miles across, now named **Valles Marineris** in honor of Mariner. However, far from being an indication of intelligent life, this "Grand Canyon of Mars" is up to four miles deep, and was probably caused by massive faulting of the crust followed by wind and water erosion.

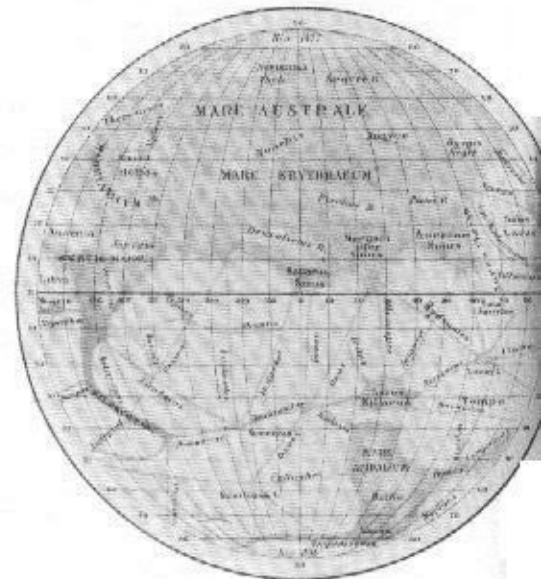
Does this mean that the canals of Mars have been worthless? Far from it! Our present-day enthusiasm for space exploration and in life on other worlds was nurtured in a broth of ideas about life on Mars. It gave science-fiction ideal material for adventure and speculation which has greatly affected us. Who knows, if Lowell had not caught the public's imagination almost a century ago, the people of Earth might not have managed by now to rise above their domestic and planetary problems long enough to send men and robots into space to find out what is really out there.

And Lowell may have left us another legacy. Perhaps with so much science fiction having been written about Mars, at least a few fertile minds have come up with exciting, detailed speculation on the nature of the Martian canals

# THE MARTIAN

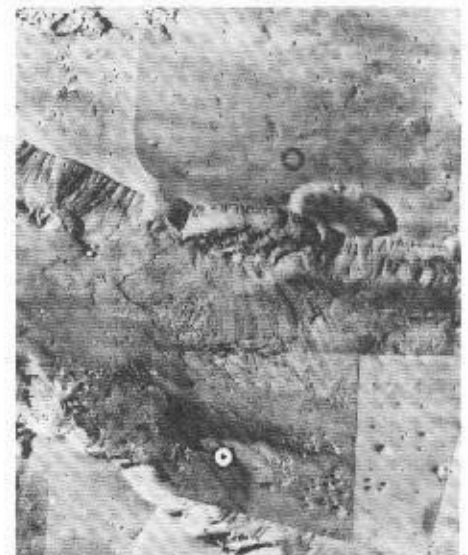
## The Martian Canals, "Discoveries" That Quite Make it to Their Century

By William



"Carta generale del Pianeta Marte", Schiaparelli's **MARTE** (Milan, 1893). Note the "oases" where canals of the dark areas, or "seas." Agathodaemon is the curve

(assuming Lowell was right) and on what we might find someday on other canal worlds. Hasn't anyone dreamed up an ingenious canal lock or an imaginative bit of canal lore? Unfortunately, a rough survey of science-fiction about Mars has proved disappointing, with only rare gems of canal speculation. In Edgar Rice Burroughs' books, John Carter of Mars (related, incidentally, to the Carters of Virginia and therefore

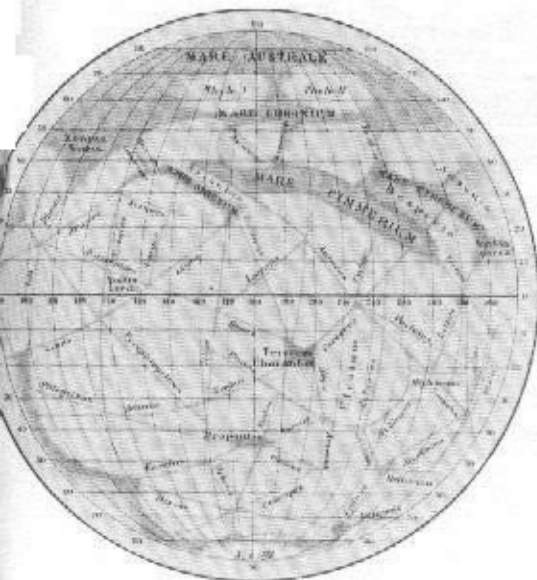


Composite "close-up" of the "Grand Canyon of Mars" - a section 43 miles wide and 1.2 miles deep, show the huge landslides which have occurred on each wall of the Canyon. Photos made by Viking 1 on July 3rd, 1976. (NASA Photo.)

# AN "CANALS"

ed" a Hundred Years Ago, Didn't  
al, but They Are Still Part of Us!

Trout III, Ph.D.



o of the Martian canals from his book, *IL PIANETA  
ROSSO*, and triangular "carats" where some canals enter  
d canal just left of center. (UCLA LIBRARY PHOTO)

to a certain U.S. President from Georgia) does in fact mention canals bordered by wide irrigated regions (the water carried underground from the canals to the irrigated crops, to prevent loss by evaporation) but he never takes a canal journey, or has an adventure on the canals of Barsoom. (The Great Rift Valley - called *Valles Marineris* now - is mentioned too, in Burroughs' *LLANA OF GATHOL*.) Robert A. Heinlein in *RED PLANET* has canals radiating from the poles, cut deeper into the soil as they get closer to the equator, to maintain the water flow. Boats used the canals in summer or winter (with ice runners), equipped with autopilots which were guided by echoes from the high banks. His canals, too, went through wide irrigated regions, faithful to Lowell. (And in "The Green Hills of Earth," Heinlein even has a Martian canal poem!) In Ray Bradbury's "The Lost City of Mars" the earthlings fill the last ancient canal with water and take a boat trip into an underground Martian city. But most stories about Mars lack the *minutiae*, the wealth of detail and speculation so dear to the canal enthusiast's heart; they were evidently not written by canal enthusiasts, a problem usual in ordinary fiction and historical novels, where most authors have rather fuzzy ideas about canals, but in science-fiction one expects more attention to detail.

The best detail in early stories found so far is in *TO MARS VIA THE MOON* by Mark Wicks, published in Philadelphia in 1911. This book, dedicated to Lowell, is a popularization of his ideas in the guise of a fictional voyage to Mars, faithfully sticking to the "facts" as then known, with the addition of some interesting speculation. Wicks gets the prize for the idea that the "carats", or triangular areas on the canal maps where they pass from the light areas ("deserts") to the dark areas ("seas") of Mars, are triangular embankments where the low level canals (in the sea beds) are pumped up by endless chains of buckets to the high level canals, and where flights of

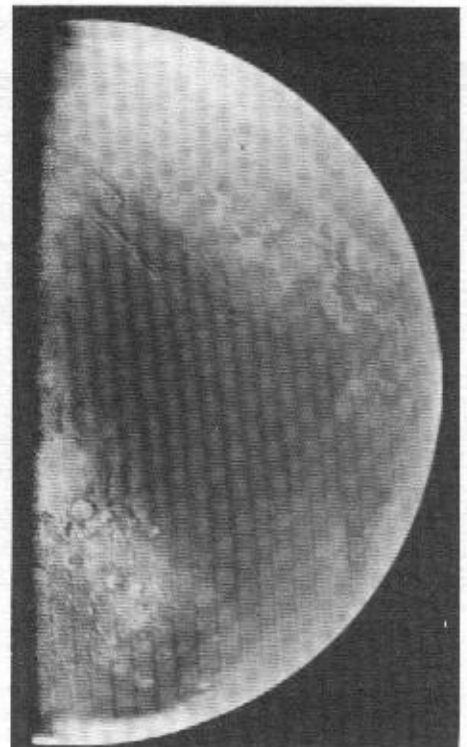
locks connect the two to permit through navigation on the larger canals. The pumps also serve to speed the flow of the water, a problem on this low-gravity planet. (We know now that the "seas" are merely dark in color, not necessarily lower than the light areas.) Wicks' fictional voyage to Mars also brings up many other aspects of Lowell's observations including the seasonal changes, supposedly caused by the gradual watering of the planet as the polar ice cap melts and flows down the canals at 51 miles per day (we know now that massive sandstorms may also play a part in these color changes); and the sudden appearance of new canals not seen before, from letting water into canals not regularly used, or recently completed. Naturally, the bridges over the canal are fairy-like (permitted by the low gravity) and constructed of "Martalium."

It is also appropriate to mention here a Martian-like speculation made by Kurt Vonnegut about his fictional "Rosewater Inter-State Ship Canal" mentioned in *GOD BLESS YOU, MR. ROSEWATER*. In a letter to the American Canal Society he added that after the canal builders accidentally broke into some limestone caves near Galen, Indiana, prospective investors in this ill-fated project were encouraged to dream of cargo-carrying submarines plying the depths of the canal, where commerce would not disturb the peace of the countryside! Finally, the ultimate in canal speculation was the report in the 1895 New York Tribune (mentioned in Hoyt's book) by a man who claimed that he could see "The Almighty" spelled out in Martian canals in Hebrew. This observation seems never to have been substantiated, in spite of its rather significant implications for canal technology.

Now that there seem to be no canals on Mars, what is a canal enthusiast to do? Will science-fiction writers stop mentioning canals in their stories, with no future prospects of a few golden nuggets of exciting canal speculation? Certainly not! Carl Sagan's estimate of the number of stars in our galaxy having at least one planet with an advanced civilization, past or present, is roughly  $10^9$  - a billion. Supposing that even if only a tenth of these have canals, the number of canal planets in our galaxy alone is about  $10^8$ , or a hundred million. So with this many canal worlds still to write about, and trillions of canals, science-fiction writers have no excuse for not writing more extraterrestrial canal stories, preferably after having done their homework by taking a look at a few terran canals. As a matter of fact, one modern writer has done just this - a ray of light which bodes well for the future of canal science-fiction. Keith Roberts, the well-known British science-fiction writer has written two stories so far on canals - one, "The Lake of Tuonela," appeared in *NEW WRITINGS IN SF 23*; and "The Trustie Tree" in *NEW WORLDS 5*. Both have been reprinted in his collection, *THE GRAIN KINGS* (Panther, 1976). We learned about "The Lake of Tuonela" from ACS member J.A. Cadisch, who read it in issues 71 and 72 of the Kennet and Avon Canal Trust's quarterly bulletin. We have Mr. L.J. Dalby, the Trust's editor, to thank for reprinting it in a canal bulletin; this is proof that Mr. Roberts knows his canal details - from a cruise on the Shropshire Union Canal, in fact, which is why the canal network on the planet Xerxes may seem oddly English!

We hope that Keith Roberts will write more canal stories (our American canals could supply some unusual ideas) and that readers will continue to let us know of old and new canal stories. Perhaps someday there will be enough for a collection.

Meanwhile, the canal society is continuing its inventory of the historic navigation canals of North America, and has every reason to believe that by the time it is through with the whole planet Earth, some other canal planet will be available for the next inventory. In fact, one extraterrestrial canal has already been inventoried, which we call the Rocky Flats Canal (or perhaps Valles



The "Grand Canyon of Mars" can be seen in the upper left running diagonally southeast, below the north polar cap, in this photo made by the Viking 1 Orbiter on June 18th, 1976. (NASA Photo.)

Vikings) - the first modern canal on Mars - the excavation of which was begun on July 28, 1976 by the Viking 1 Lander!

(Dr. Trout is Vice President of the American Canal Society.)

## "THE JOSIAH WHITE"

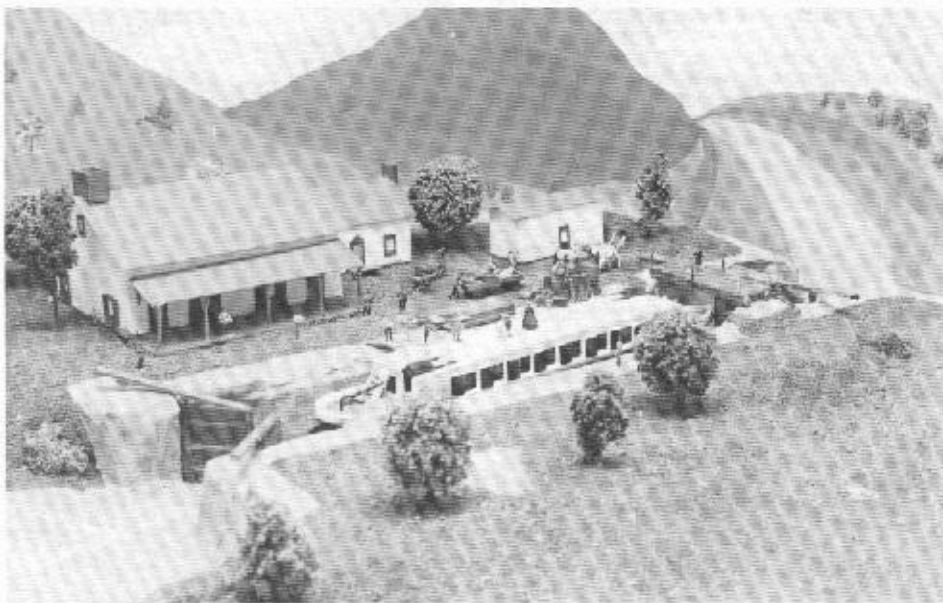


July 1, 1978 was the first official day of commercial operations on the Lehigh Canal since 1931. The canal boat, "Josiah White", formerly the "A. Emerson" on the Delaware and Hudson Canal (see *American Canals #11 & #23*), operated from July 1st to October 29th. During this time the "Josiah White" carried 4,361 passengers. The boat was pulled by two mules and had a crew consisting of a mule driver, captain, and deck hand.

The boat was named after Josiah White, founder of the Lehigh Coal and Navigation Company, which built the Lehigh Canal. Josiah White was not only a canal builder but also an inventor. He invented the bear-trap lock, the drop gate lock mechanism, and some of the country's first wire rope suspension bridges.

During 1979 the "Josiah White" will be operating Wednesdays through Sundays from Memorial Day through Labor Day and week-ends until the end of September. (Photo by J. Stephen Humphrey.)

# PENNSYLVANIA CANAL DIORAMA



The above interesting photo was sent to us by Richard L. Mix. It shows a canal diorama built by Mix and his two sons, Scott and Andrew, for the Lycoming County Historical Society Museum in Williamsport. The canal boat model, shown in the lock, was designed by Bill Shank.

## ERIE CANAL BIBLIOGRAPHY

With the cooperation of the **American Canal Society**, noted canal author Lionel D. Wyld (**Low Bridge on the Erie Canal**) has prepared a fine bibliography for the Erie Canal. The introduction states, "This bibliography is an outgrowth of discussions with Captain T. F. Hahn, USN (Ret), former president of the **American Canal Society**, regarding the ongoing series of reference lists the Society is making available on the artificial waterways of the various states. It was initially agreed that so far as New York State was concerned (1) a single bibliography covering all the canals would be impractical and (2) the Erie should be treated separately because of its historic importance and influence. Also, because of the extensive literature and other documentation on the subject, it was recognized that any useful treatment of the Erie Canal, while it would have to be selective, would be a publication with a considerable number of entries.

The present bibliography is divided into three major categories: (1) BOOKS, MONOGRAPHS, AND THESES; (2) ARTICLES, PAMPHLETS, AND BROCHURES; and (3) FOLKLORE AND GENERAL LITERATURE. The first part is self-explanatory: These are the principal works, most often consulted as references on the Erie Canal. This section lists books and monographs dealing significantly or entirely with the canal, as well as other books, books' chapters, and academic theses that offer valid Erie information. "Books" is used somewhat loosely to include also selected important published booklets, generally obtainable through commercial book outlets. The second section lists articles of reference interest to the historian of the Erie, and also includes separately issued pamphlets, and booklets or brochures such as those offered by museums and historical societies either gratis or at a nominal charge. The last section includes books and other pieces which seem to be intrinsically literary or folkloric.

Published by the **American Canal Society**, **The Erie Canal; A Bibliography**, 16 pages and attractive cover, is available at \$3.75 (includes mailing) from Lionel Wyld, 20 Countryside Drive, Cumberland, RI 02864.

## INLAND WATERWAYS EXHIBITION

International visitors and delegates to the Inland Waterways Exhibition, Conference and Study Tour will have what will surely be a unique opportunity of assessing the potentialities of waterborne transport on the inland waterway networks of Europe, and indeed the world. European industrialists, shippers and forwarders, representatives from barge and shipping companies, trade delegations and the widest cross-section of specialized purchasing influences involved with every aspect of the global inland shipping market, will be invited to attend the events, scheduled from the 28th of May to the 1st of June, 1979 in Strasbourg, France.

In association with the exhibition there will be a concurrent conference on world inland waterways. The conference programme is being drawn up by the conference division of Brooks & Mack Consultants AG, Basle, Switzerland, under the guidance of a distinguished group of authorities drawn from many water interests.

As at the present scheduled, the conference will run from Tuesday 29th May to Thursday 31st May inclusive, and will consist of five half-day sessions. Topics include waterway development in the less-developed countries, commercial and regulatory aspects of the integration of the East and West European waterway networks, innovations in cargo-vessel operation and in fluvial navigational aids, the place of waterway transport in the Common Market during the latter half of the next decade and the introduction of river/sea vessels and its implications. The study tour, by river to select Rhine-basin installations, will be of primary interest to those delegates - especially from outside Europe - whose main concern is with engineering works or port operation.

The exhibition is being organized by **BROOKS & MACK CONSULTANTS AG**, Basle and GERP, Paris. For further information, enquiries should be directed to Brooks & Mack Consultants AG, P.O. Box, CH-4018 Basle, Telephone 061/34 81 16, Telex 63 422.

## Future Canal Parks?

Many of the western states not lucky enough to have historic navigation canals, have irrigation and water supply canals instead. Because many of these canals are obviously potential linear parks and open space, especially near expanding urban areas, it is important to start now to protect these rights-of-way from encroachment, and to plan for future park use when building new canals. The same kind of work and planning used for historic canal parks, is needed in the west, where some urban canals - those needed the most - have already been culverted. The Bureau of Reclamation canals are of especial interest because there are hundreds of them, all controlled by one agency, with the prospect of an overall park and preservation policy.

An article on "Adventure Trails" by Mike Misner in the summer 1977 issue of the Bureau's periodical, **RECLAMATION ERA**, described four bikeways on Bureau canals. Three were in California: a 67-mile trail east of San Francisco, and 30 miles in the Antelope Valley north of Los Angeles, have been completed by the state of the 444-mile **California Aqueduct Bikeway**; 14 miles have been completed of a 22-mile bikeway along the **Folsom South Canal** near Sacramento; and still in the works is the 40-mile **Contra Costa Canal Bikeway** near San Francisco. The fourth is the **Papago Bicycle Loop** along two canals in Phoenix and Scottsdale, Arizona.

We asked the Bureau for more information on their parks and canals, and have received a number of maps from the regional divisions, which are now in the files of the ACS Canal Parks Committee and available for use. It was disappointing to learn that on the hundreds of Bureau canals, evidently only those mentioned above are officially used as parks. The Pacific Northwest Division went so far as to say that none of the Bureau canals in Idaho, Oregon and Washington were potential parks, although not all the divisions were so pessimistic: there are canal parks and trails waiting only for the money and interest to create them. Generally, the larger canals themselves are not at all suited for water recreation and can be dangerous because of fast water and siphons; the safety problem is a major one for the Bureau - the **California Aqueduct Bikeway**, for example, is carefully fenced off from the canal. The canal right-of-way, however, is the most valuable asset, providing a publicly owned linear corridor off main roads and sometimes through urban areas. Most canals are really parks, unofficially, and can be followed by foot, bicycle, or even automobile if the access road permits. There are of course other canals than Bureau ones, some from pioneer times, small and quiet enough to be more like the canal parks in the east, with a footpath and no need for fencing, as in Salt Lake City (See "Salt Lake City's Early Day Canals" by Bill Troup in the March 17, 1977, **UTAH FARMER STOCKMAN**, 50¢ from 610 Crandall Bldg., Salt Lake City UT 84101.)

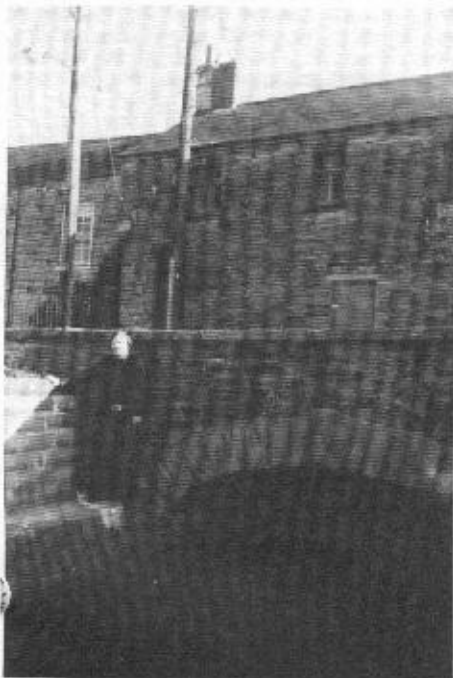
It is time for westerners to systematically and zealously protect these linear corridors, especially in cities, so they in future may be trails and linear parks. As for the Bureau of Reclamation's canals, they are in a similar position to the canals of England, controlled by one agency with the prospect of wholesale preservation of open space corridors for future use. At the very least, the Bureau should start the policy of protecting their rights-of-way from encroachment in developing areas, where parks will be most needed; they should not allow developers to whittle away at the canal corridors. It may not be so apparent now, but many of these corridors will be priceless in the future, with water or not, and it should be the duty of the Bureau of Reclamation to keep them intact until that day comes.



## With Sam Cash on the Tavistock Canal

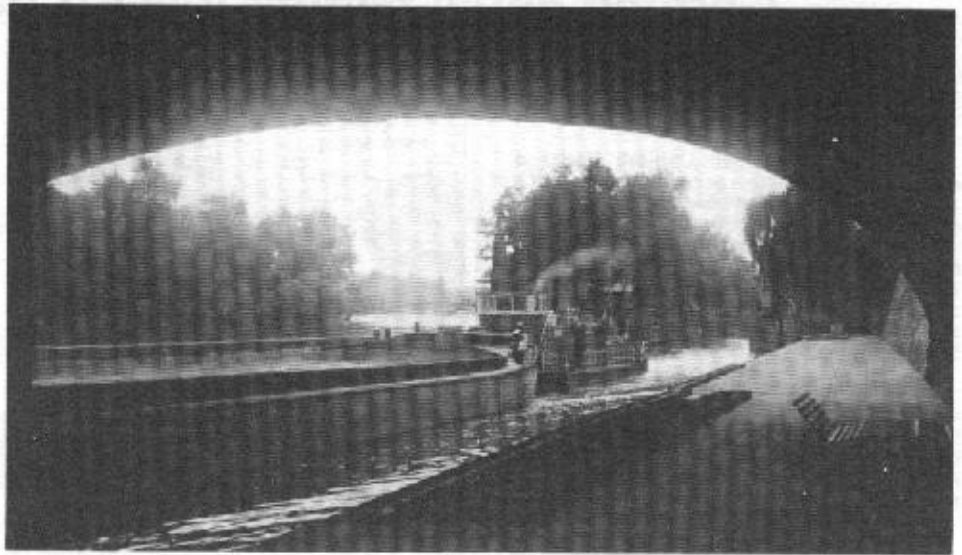
Sam Cash, who has already appeared in **AMERICAN CANALS** several times, is one of our most enthusiastic members in England. Sam is moving his textile designing business to Bristol but in September he was still in Tavistock, in southwest England, when I finally met him for the first time. Tavistock, fortunately for Sam, is at the upper end of the Tavistock Canal, which runs 4½ miles down to Morwellham Quay where there is an open-air museum, so he has been able to work actively on the canal and encourage local interest in it.

We took the afternoon off to take a walk down the canal, which starts at a stone arch bridge surrounded by the original warehouses which stored tin ore to be sent by canal. Tavistock is Sir Francis Drake's birthplace so the canal flows through a park with his statue and bowling green, then under an abandoned stone viaduct of the Great Western Railway, across an aqueduct embankment, past old mine adits, and past an abandoned branch canal which in the 1820's took stone from Mill Hill Quarry on its way to London Bridge and then to Lake Havasu City, Arizona. Then we came to a deep, dank cutting and the mouth of the 1½ mile tunnel, inscribed "1830." "You no be wanting to go there," said a local with a sheep-dog and a tweed suit when we asked for directions to the other end of the tunnel, which lacks a towpath. But he finally told us, from the other portal a short stretch of canal leads to a long inclined plane down to Morwellham Quay's fantastic open-air museum complete with the canal and plane, limestone kilns, waterwheels, a narrow-gauge trip into a mine, and a small hydro plant with Pelton wheels which runs off the water from the canal. From here, ore and limestone was shipped down the Tamar River. Literature available from the museum includes a leaflet with the "Woodland and Canal Trail", and **THE TAVISTOCK CANAL** by Carolyn Hedges. The address is Morwellham Centre for Recreation, Near Tavistock, Devon.



Sam Cash at the End of the Canal in Tavistock. (Photo by Bill Trout, September 1978.)

## CANAL HUNTING IN PRAGUE



The Detsky Island Lock in Prague, taken from under the "First of May" Bridge (Photo by Bill Trout, September 1978.)

The ancient city of Prague is beautifully situated on the **Vltava (or Moldau) River**, a tributary of the **Elbe** which flows northwesterly through East and West Germany to the North Sea. The Vltava has been canalized by locks and dams up to and beyond Prague: in old prints of Prague you can see poled boats and log rafts running the sluices through the low dams. Now there are locks for commercial and excursion boats, but the sluices are still there.

There are three sets of locks in Prague, two of them in the city center near the Old Town and Hradcany Castle. They are all of roughly diamond-shaped brownish stone trimmed with granite, and have remotely operated miter gates. Roger Calvert in his book on **INLAND WATERWAYS OF EUROPE** says there are two sizes of locks in Czechoslovakia, 8.2 x 67 meters, and 20 x 147; there are two locks at each dam, perhaps of these sizes, the longer lock having an intermediate pair of gates for short tows.

You might start your tour of the canals of Prague by going to the excursion boat dock (pristaviste parniku) on the right (east) bank between the Palackeho and Jiraskuv bridges, to see when

a boat might be going downstream, perhaps to the Zoo through two locks. When I was there in September, the Zoo boat only went on Sundays, the rest of the time going on excursions upstream, and not through any locks. The Czech travel agency, Cedok (10 East 40th St., N.Y. 10016) may have further information.

From the dock, cross the Jiraskuv Bridge. Just below is a low dam which has a small lock dated "1922" next an old dark tower on the right bank; a sluice through the middle of the dam; and the entrance to a canal on the left bank, at Detsky Island. This is the most interesting of the canals in Prague, extending half a mile downstream, almost to the famous Charles Bridge, where it also bypasses the low dam seen in old prints of the bridge. Walk along the west bank to see the guard gates and the lock, which has an extra pair of miter gates in the middle and a statue and "folly" at the lower end near the 1st of May Bridge.

Between this bridge and the Charles Bridge, leave the riverbank and follow the Certovka, a mill-race, through "The Venice of Prague," with a wooden water wheel at the upper end, then a park, and another water wheel amongst the back streets, just before the race goes under the Charles Bridge. You might see kayaks practicing maneuvers through the slalom gates hanging across the stream. From the Charles Bridge and its statuary you can look back upstream at the navigation canal.

The next locks, two miles downstream, are also at an island (Prague has used her islands to make wonderful parks, unlike some U.S. cities); at the head of Stvanice Island is a dam, with a long sluice on the left bank, and near the right bank below Hlavkuv Bridge there are the two parallel locks, one large and one small. The Hallwag city map of Prague shows the tram routes, if you don't want to walk. (Most shops sell tram tickets; you can't buy them on board.) The commercial harbor of Prague is another mile downstream and the next locks three miles further near the lower end of Cisarisky Island, if you want to go that far, but these locks are not as accessible as the others.

For more information on the Czechoslovakian inland waterways see Roger Calvert's **INLAND WATERWAYS OF EUROPE** (available from the American Canal and Transportation Center); he suggests contacting the Ceskoslovenska Plavba Labsko-Oderska in Prague for river excursion schedules.

## WELLAND CANAL ANNIVERSARY

The 150th anniversary of the opening of the first Welland Ship Canal in 1829 is to gain national and international recognition through the planning activities of an overall co-ordinating committee.

General chairman of the committee, Ralph S. Misener, a well known St. Catharines' businessman who is chairman of the board of Misener Transportation Limited has revealed plans here today to re-create the person of William Hamilton Merritt, the founder of the Welland Canal scheme, to travel in Canada and the United States as a promotional ambassador for the celebrations.

The first Welland Canal was opened 50 years before the railroads started to spread westwards, he commented, and supplies for this railroad construction were carried by ships able to enter the Upper Lakes through the Canal.

The Welland Canal 150th Anniversary Committee has arranged an appropriate address - P.O. Box 1829-1979, St. Catharines, Ontario L2R-7K1.

# German canal climbs toward European link

[Reprinted from *Engineering News Record*, June 22, 1978. Copyright. McGraw-Hill, Inc. All rights reserved.]

West Germany's Main-Danube Canal is stepping up to its highest point and heading for a 1985 completion, but uneven settlement and greater hydraulic forces than anticipated have damaged some of the side pond locks, requiring repairs and bringing design changes in the locks yet to be built. Because of low natural flow in the waterway, concrete holding ponds beside the locks recover 60% of the water used in locking barges through.

The 106-mile Europa Canal, as it is also known, eventually will link the Rhine and Main rivers with the Danube, permitting traffic to flow between the North Sea and Eastern Europe (see map). But protests on economic and environmental grounds may delay its completion.

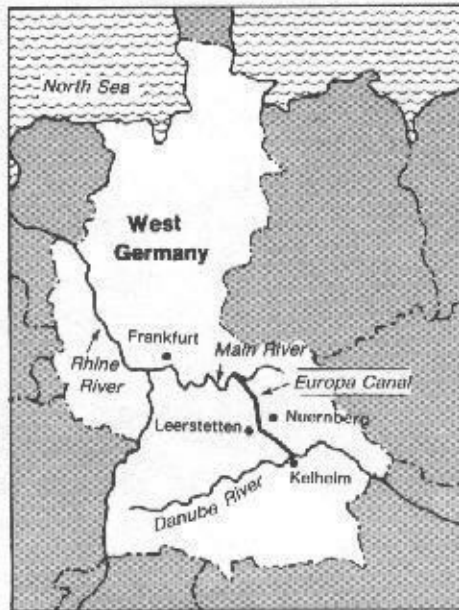
Work started on the 44-mile section from the Main to Nuernberg in 1963 and recently was completed at a cost of about \$400 million. Now under construction from both ends is the toughest section south of Nuernberg, where the waterway will climb to its peak, 1,065 ft. above the Main, then drop 951 ft. to the Danube. That is expected to cost \$750 million.

The canal will have a total of 16 locks, plus seven bridges carrying it over obstacles. In addition, the government spent a considerable amount improving the Main River and installing 27 locks both before and after World War II. And last month it opened the Danube to commercial barge traffic up to Kelheim, where it will join the canal.

The locks all have a standard length of 623 ft. and width of 39 ft. to accommodate the common "Europe size" self-powered barges, typically traveling in tandem, or a pair of the new Europa II barges pushed by a tow boat.

The theoretical capacity of the canal is about 50 million tons per year. However, the lock system now operates only 16 hours a day, and with weather delays and less than maximum loads locking through, the actual volume is around 15 million tons. There is room for a second, parallel string of locks to double the capacity when necessary.

**Unexpected forces.** With canal traversing fairly flat land, then rising abruptly to cross a divide south of Nuernberg, there is not sufficient natural flow to flush water through the locks with every barge passage. Therefore the canal company provides ponds alongside each lock to recapture up to 60% of the water with each operation. Often in Europe the side ponds are stacked



The Europa Canal will link major European waterways.

to conserve space. Along the Main-Danube Canal, however, there is enough room to step the three pairs of open ponds back in a terrace effect.

Water is pumped in and out of a lock through galleries flanking it in the spread concrete base (see drawing). Water is also pumped from intersecting streams and rivers to fill the canal.

The locks completed so far have thin reinforced concrete walls spanning between end towers, buttressed by reinforced concrete ribs. The walls are cast in 48-ft.-wide lifts with construction joints between them containing seals. The design minimized the amount of concrete needed. It also was intended to make the one exposed wall on the pond side more esthetically pleasing.

The locks built before Leerstetten were designed with their side ponds immediately adjacent to the machinery hall — only about 40 ft. from the lock wall — to attain the fastest flow times. However, after about six months of operation with about 5,000 water changes, the arrangement was found to have considerable problems. "We encountered additional forces that did not show up in the calculations," says Rolf Schaake, head of the regional water and shipping office in Nuernberg.

One was uneven settlement caused by the proximity of the ponds. Although they and the lock do not share a common foundation, they are closely linked statically. That, combined with effect of the water flowing back and forth caused the locks to list toward the ponds.

"Some of our most famous static experts did the calculations," says Schaake. "But the walls showed movements much bigger than expected." At their midpoints, the walls were squeezed as much as 35 mm (1.4 in.) out of line. At two locks, shear forces developed between the end towers and the walls and between lifts toward the center that ripped out the joint seals. Also the floor slabs cracked.

And, there apparently is a fatigue problem with the soil underlying the two damaged structures, according to Herbert Geldmacher, a top designer for the Rhine-Main-Danube Co., the organization sponsored by the federal and Bavarian state governments to develop the waterway. The soil consists of coarse deposits with a high sand and clay content.

To regain stability, concrete was cast between the walls' ribs and additional reinforcing was drilled into the base joints, some of it post-tensioned. Repairs to each lock cost close to \$1 million. Their original cost was \$25 million to \$30 million apiece.

To avoid a repetition of the difficulties, future designs will move the side ponds away from the lock chamber and have more massive walls, tapering from a thick base, and founded on a wider foundation.

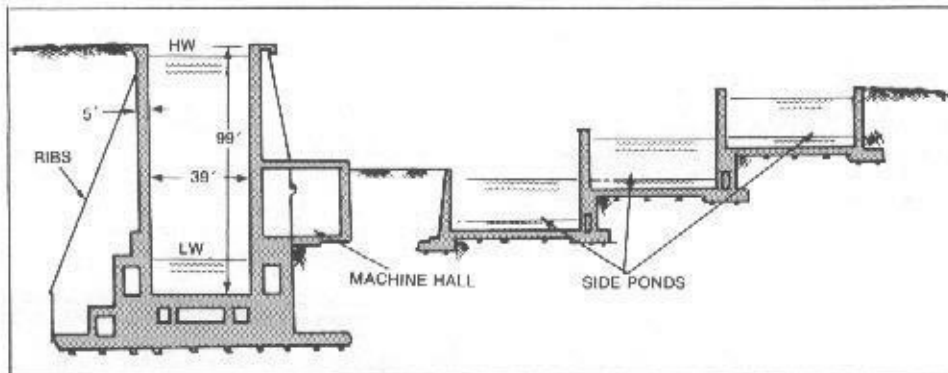
(Concluded on Page Eleven)

## Steam on Canals

"Messrs. Editors. — On page 166, current volume of your journal, *The Scientific American*, I notice a communication under the heading, "Steam on the Towpath." There is certainly much room for improvement in canal navigation and I have longed to hear of some movement being made to this end. Hoping that the time for this improvement is near, I would offer my idea, which is neither to favor steam on the tow-path nor propellers, but instead what I would denominate "pursuers." To understand this, I must explain. Let a hawser or cable be suspended over the middle of a canal for any distance, one or ten miles, properly secured at regular intervals. A boat with an engine of sufficient power is to be placed directly under the cable, and connected to it by machinery. By the operation of this machinery on the cable, the boat is to be moved forward, just as one would move a skiff by pulling along a rope stretched across a stream. A speed of at least 75 miles an hour could be obtained without difficulty, whilst the dangers of railroad travel would be overcome. One boat could be connected to another forming trains as on railroads. On the same plan rivers and coasts could be navigated. Though there are difficulties to this plan, yet greater have been overcome, and the day may not be far distant when traveling by water will leave railroading behind. W. F. Mappen, Mayslick, Ky., April 13, 1864.

(Seventy-five miles an hour ought to satisfy most persons. Correspondents mistake in making too high estimates, as it gives to many a good idea the idea of a chimera, and deters sober-minded men from undertaking it. — Eds. (*The Scientific American*.)"

(From *The Scientific American* Vol 10 #19, 7 May 1864. Submitted by Bill McKelvey, ACS Director.)



Cross-section of the Leerstetten Lock, flanked by three levels of storage ponds. The thin walls will be replaced by heavier tapering design at other locks.

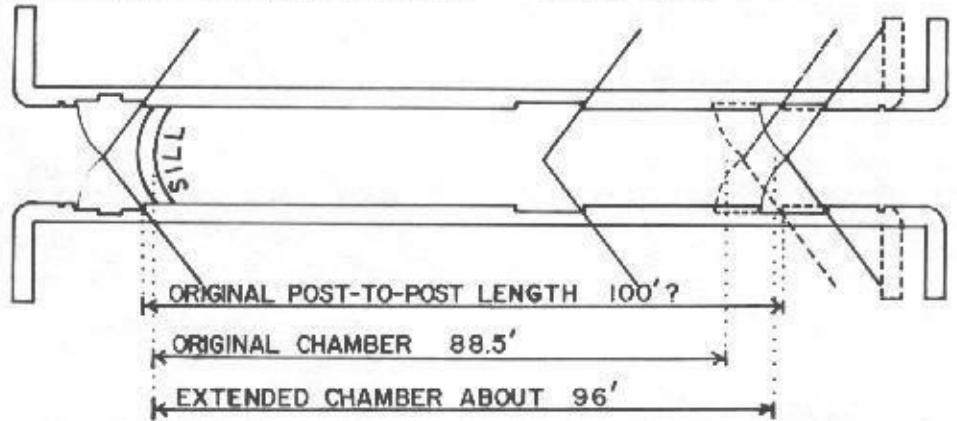
# The Cartersville Connection – Solved?

By Wm. E. Trout III, Ph.D.

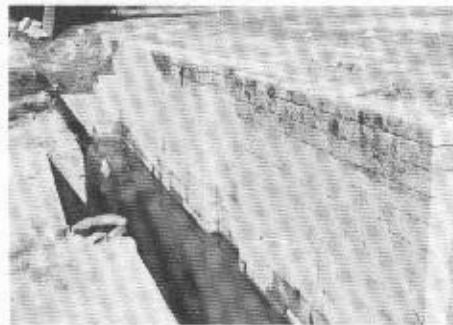
The Cartersville Connection was a short branch canal with a stone lock, from the James River & Kanawha Canal down to the James River opposite Cartersville, Virginia. The lock has an unusual history because five months after its completion in 1851 the embarrassed canal company learned that a measuring error had been made during construction so that it was too short to take a canal boat! The lock was subsequently lengthened, and remains in fine condition today. But it was not until the owner, Mr. F.D. Gottwald, Sr. (who has also been restoring Tredgegar Iron Works in Richmond) and his farm manager Mr. Johnson, removed a century of silt from the lock, that the reason for the engineering mistake came to light.

Six feet below the coping, the upper miter sill was found, but unlike all the other locks on the canal built up to that time which we know of, the sill was just downstream of the upper gates, instead of upstream as usual. On the other locks on the canal, the standard distance between gate posts was 100 feet, to provide a chamber for boats at least 92 feet long. Could the builder have given this lock the standard 100 feet between posts, forgetting that the unusual sill would make the chamber too small?

With canal enthusiasts Howard Rock & Son we made a measured drawing of the lock, which included the position of the sill and all three pairs of gate recesses. Earlier we had thought that the middle pair of gate recesses was the bottom pair of the original short lock, but that gives us a chamber only about 60 feet long (not considering the sill), which is just right for the poled batteaux which would have been used on the Willis' River, not far from Cartersville. So this middle pair of gates was intentional. Also, in 1852 the engineer had reported that a boat 91 feet long could have passed through the lock if it had only



Scale drawing of the Cartersville Connection Lock, showing the presumed location of the mistakenly placed gates, in dashed lines. (Bill Trout)



Looking up the Cartersville Connection Lock after excavation. Note the extra pair of gate recesses, the broken upper sill, and the stone arch in shadow at the bottom of the sill. Compare with the photo in the February 1975 AMERICAN CANALS! (Elle Weeks photo)

been 2½ feet longer, so the original short chamber was 88½ feet long. And sure enough, if you mark on the scale drawing a pair of gate recesses with the posts 100 feet from those of the upper gate, you get a useable chamber about 88½ feet long, because the sill takes up some of the room. The present, lengthened chamber would take a boat about 96 feet long, more than the needed 92 feet, but probably necessary because boats would have to be sure not to get hung up on the upper sill when locking down (as happens to boats these days in England, where there are similar sills). In fact, the sill has had a number of stones taken away (we know they didn't just fall into the lock), most probably to keep boats from hanging up on it, because the boatmen were not used to a sill in the chamber.

Why was this unusual sill used? Probably the company was worried about water loss from the main canal. With a sill downstream of the upper gate, the upper gates could be short and therefore stronger than gates going down the full height of the lock. The center pair of gates would also have saved water, because batteaux could have used only part of the chamber. But the records tell us little, so this is all surmise. They also didn't tell us of the fantastic cut-stone archway at the bottom of the sill. This was the outlet of two underground sluices (called Ground Paddles in England) behind the upper gates, used to fill the chamber. So the lock is full of unusual features.

What is the future of the Cartersville Connection Lock? Mr. Gottwald sold his farm, but we still hope that the lock can be acquired by the Cartersville Bridge Association, which saved the historic bridge close by. It is just what they need! (Bill Trout is Vice President, ACS & Chairman, Canal Parks Committee)

## German Canal Climbs Toward European Link

(Concluded from Page Ten)

**More challenges.** The Leerstetten lock – being built by Ed. Zueblin, of Stuttgart, and Riepl, of Regensburg – does not include all those revisions, however. It retains the slim, 5-ft.-thick walls with ribs, but the chamber rests on a broadened, 118-ft.-wide foundation slab and the first pair of side ponds is moved back about 80 ft. from the lock structure. Also, the wall lifts are reduced to 39 ft. wide to prevent fracturing.

Two other locks now under design will have walls tapering from 11.5 ft. at the bottom to about 8 ft., and one will have its side ponds moved 98 ft. away.

At another lock location, in Sulz Valley south of the divide, designers anticipate a serious soil problem. The material there, at Dietfurt, is described as opaline, a gelatinous form of silica that often has a high water content and is highly soluble. When exposed to water, it turns sludgy.

Alfred John, manager of that section in the canal company's Munich headquarters, says that excavation will require a sheetpile cofferdam as deep as 65 ft. or the more expensive process of dewatering down to that level, possibly with diaphragm walls to hold back ground-water.

The poor soil in the area, as well as reaction to the erosion failure along the Elbe lateral canal near Hamburg two years ago, led to redesign of the stretch, says Schaake. The original plan was to rebuild a section of the old Ludwig Canal, a picturesque but much too small waterway, parallel to the new one, that was built by King Ludwig of Bavaria in the early 19th century.

In the Sulz Valley, the old canal hugs one side of the valley some distance above its floor, following the natural contours. Sloping layers of various materials on top of the treacherous opaline soil would have made construction of what amounts to a large dam on the side of the valley a risky proposition.

The original routing also called for a large steel trough bridge to carry the canal across the valley at one point. While three canal bridges were built along the section north of Nuernberg, the Elbe washout cast doubt on their integrity. There, joints at the end of a canal bridge washed out. So it was decided to place the Sulz stretch of the Main-Danube Canal smack in the middle of the valley where the danger of slides is minimal. That eliminates the cost of the bridge and makes the project safer, says Schaake.

### NORTH BRANCH EXTENSION PENN'A. CANAL.



#### TO CONTRACTORS.

NOTICE is hereby given that *Sealed Proposals* will be received at my office in Tunkhannock, until sunset of Tuesday, 31st day of July next for putting under contract the most difficult portions of the said North Branch Extension on 54 miles of canal comprehended between the present termination of the North Branch Division at Lackawannock and the termination of the North Branch Extension at Wyandina. The work will be heavy and well worthy the attention of those who wish to contract. Plans and specifications will be exhibited at Tunkhannock five days previous to the letting.

JERE ADAMS, *Sup't.*  
of the North Branch Extension  
Penn'a. Canal.

Dated at the  
Superintendent's Office, Towanda,  
the 24th day of May, 1838.

Richard Mix, of Williamsport, Pa., has sent us the above advertisement from "The West Branch Republican" of 1838. It indicates the importance which the Pennsylvania Canal Commissioners attached to the completion of the North Branch Extension, to make connection with the Finger Lakes and the Erie Canal. This difficult section was not placed in operation until 1856.

## PUBLICATIONS OF INTEREST

Post card 6x9" of the reproduction of the 1803 Middlesex Canal Packet Boat "Colonel Baldwin" at Woburn, Mass. is available free for a large self-addressed envelope from: Woburn Canal Society, 11 Lowell St, Woburn, MA 01801.

The **Middle Atlantic Engineer** by Harold Kanarek, the history of the Baltimore District of the Corps of Engineers, containing some canal information, is available to ACS Members at \$8.25 from: U.S. Army Engineer District, Baltimore Corps of Engineers, P.O. Box 1715, Baltimore, MD 21203.

The booklet "Ecotour of the Rideau Canal," included with this issue of **American Canals**, was provided through the courtesy of Superintendent W. D. Bennett of the Rideau Canal Office, Parks Canada.

Filmstrip, sound-color, 66 minutes on "Ohio's Canal Era" is available from A & E Associates, Box 5200, Fairlawn, OH 44313 to whom requests for info may be directed. Purchase price is \$69.

Emily Kimbrough's canal book **Better Than Oceans** published by Harper & Row is a narrative of her trip on the PALINURUS in France, described by ACS Member Don Ramsey as a rather dull narrative. Previous books on canal travel include **Floating Island** and **Time Enough**. Ms. Kimbrough has a long list of titles and is best known as co-author with Cornelia Otis Skinner of **Our Hearts Were Young and Gay**.

"Farmer's son Robin Arden threw a traffic sign from a canal bridge, hitting a woman in a boat, because he resented people enjoying themselves whilst he worked, Chester magistrates were told" - from a report in the *Manchester U.K. Evening News*. (From WATERWAYS WORLD, October 1978)

## Now the General Can Carry a Yardstick

The need for Generals and canal buffs to carry a tape measure was clearly demonstrated in Lew Richardson's article, "Should the General carry a Yardstick?" in the May, 1975 issue of **American Canals**. Poor General McClellan's invasion of the Shenandoah Valley came to nothing because the pontoons for his floating bridge across the Potomac to Harper's Ferry, were C & O Canal boats brought up the canal from Washington, and nobody had checked the dimensions of the river outlet lock. The boats couldn't get through because the lock was too small and the whole army had to give up and go back to Washington!

More examples can be added, such as the C.S.S. **Appomattox**, fleeing up the **Dismal Swamp Canal** from the Yankees, which was two inches too wide for South Mills Lock and was burned to prevent capture; the partial removal of the wooden Baillie-Grohman Canal lock in British Columbia by the last boat to go through, because the lock wasn't big enough; and the embarrassing incident of the **James River & Kanawha Canal's Cartersville river lock**, which turned out to be 2½ feet too short. Even today, in England, pleasure crafts just wide enough (theoretically) for narrow locks can jam if the lock walls have been pushed inward over the years.

For measuring locks, nothing can beat the 100' steel tape measure but that is much too bulky for everyday wear, and in this metric era one needs both a meter stick, and a yardstick for making sense of structures built by the foot. Fortunately, there is now available a miniature pocket tape measure called the TY3ME Thin Pocket Rule, 10' (3 meters) long with inches on one side and centimeters on the other, not much bigger than an American Canal Society Erie Canal Commemorative Medal. It is available in some hardware stores and from Stanley Tools, New Britain, Connecticut 06050. Next what we need is a 5-meter miniature tape for measuring our 15' wide locks.

## CLASSIFIED ADS

### OHIO CANAL SESQUICENTENNIAL PLATTER



### CANAL BOAT LOCKING THROUGH LOCK 14 BETWEEN AKRON AND CLEVELAND

LIMITED EDITION OF 400

Fine oval Walker China Platters (only 60 remain to be sold) at \$12.00 each including postage. History Booklet and other printed material also included.

**ORDER FROM:** Canal Commission  
Western Reserve Historical Society  
10800 East Boulevard  
Cleveland, Ohio 44106

**WANTED TO BUY. CANAL MULES.** C. W. DERR would like to purchase two head of mules (models). One inch scale would be fine, but other sizes will be considered. Material and color not important. Send description and price to C. W. Derr, 317 Main St., Freemansburg, PA 18017.

Anyone desiring to take a carefree canal or river vacation in England in a fine old converted canal narrow boat complete with steerer who takes over the problems of engines and such, would enjoy a vacation in the PHOBOS owned by ACS Member Tom Sewell, East Whitley Farm, Shamley Green, Surrey, England.

### AMERICAN CANAL AND TRANSPORTATION CENTER

#### Canal Medals

- Allegheny Portage Railroad* - Engine house & train, reverse Skow Arch Bridge with train. Amerlite, 2"-dia. Unique. \$3.00
- Chesapeake & Ohio Canal* - Lock #16 and canal boat, reverse company seal. Minted 1977. Antique bronze, 1½". mint. \$5.00
- Erie Canal* - Opening of C&O Canal, 150th Anniversary medal. Bronze. 1½", only a few left. \$7.00
- General Canal Coin*. Minted by York Coin Club 1975. Mint condition, bronze, 1". Lock scene with boat, reverse item on canal era. Rare. \$4.00
- Ohio Canals* - 150th Anniversary medal. Original minting, 1975, limited. Antique bronze, mint, 1½". Very nice canal scene, reverse Ohio State seal. \$6.00
- Pennsylvania Main Line* - 150th Anniversary. Packet boat entering a lock. Mint condition, limited edition by Franklin Mint, bronze, 1½". \$6.00

Prices guaranteed through 15 May; may increase thereafter. Plus 75¢ shipping: ACTC, Box 310, Shepherdstown, WV 25443

## Canaling Through France



Many of our ACS Members are exploring and enjoying the many miles of canals still in operation throughout Europe. Here is a photo sent in by Dean Brown McNealy of Kentfield, California, who made a canal and river trip last summer in the "Wirreanda", shown here on the Canal Lateral de la Loire. Note the lush, rural countryside on this photo, taken near the Saccerre wineries. McNealy also traveled the Canal de Briare.