

AMERICAN CANALS

BULLETIN OF
THE AMERICAN CANAL SOCIETY

BULLETIN NUMBER 69

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

MAY 1989

PRESIDENT'S MESSAGE

Remember when you dreamed about flying around the world, to have a nonchalant answer to "What did you do over the weekend"? Well, the intelligent canaller can do better than that, by taking the ACS four-day Grand Tour of the New England canals, over the Memorial Day weekend this month. Our V-P Bill Gerber has whipped up quite an event! There might still be time to sign up: check with Bill at (508) 251-4971. See you there!

We still need a Chairman for our ACS Canal Archaeology Committee. The first objective is to help archaeologists who find themselves doing a canal site, by starting a bibliography on American canal archaeology. If you're interested, let me know.

On April 24th, ACS member George Rawls and I had the honor of attending the dedication ceremonies for Old Santee Canal State Park in Moncks Corner, South Carolina. It is a noteworthy example of corporate responsibility, by the state-owned power company, Santee-Cooper, which had its roots in the canal, and by the South Carolina Department of Parks, Recreation and Tourism. Most importantly, they supported an extensive archaeological investigation of the canal in the park, which revealed details of the wooden tide lock and located lock gates and several boats, which are being carefully preserved. The studies go to show that although canals all have their similarities, each has its own unique architecture and story to tell, especially Col. Senf's unusual Santee-Canal, the country's first summit-level canal, which opened in 1800. There'll be more about it in the park's museum, scheduled to open next year. We'll keep you posted.

Bill Trout

SEAWAY TONNAGE UP IN 1988

The best shipping season in four years from a tonnage standpoint has St. Lawrence Seaway Authority officials tooting their horns in modest celebration.

A total of 43.5 million metric tons of cargo moved through the Welland Canal in 1988, up some 775,000 tons — about 1.9 per cent — over the previous year.

The increase in business came despite the fact Canadian grain shipments — traditionally the biggest chunk of traffic in the Seaway system — were down 25 percent in 1988 because of a severe drought in Western Canada. (*St. Catharine's, Ont. STANDARD, March 10, 1989*)

LAKE ERIE - OHIO RIVER CANAL RE-STUDY BEGINS



A non-profit organization known as the "Great Lakes Inland Waterway, Inc." with headquarters in Atwater, Ohio, proposes a ship-canal between Rochester, Pa. and Ashtabula, Ohio. The accompanying map shows how the proposed canal would create a "complete water circle" in central USA to provide inexpensive water transit throughout this heavily industrialized area.

I am writing once again as an ACS member and a long-time Great Lakes Inland Waterway promoter to announce that the long-sought official restudy of this Lake Erie-to-Ohio River Canal project has just started. As you may recall, legislation to get a restudy of the concept (which was last done in 1961 to 1967) was introduced in 1985 by U.S. Rep. James Traficant, Jr. In October of 1986 the House of Representatives authorized the U.S. Army Corps of Engineers to undertake a \$8 million restudy; the Senate approved the restudy in June of 1988, appropriated study funding, and in August President Reagan signed into law H.R. 4567 as part of FY 1989 Energy and Water Development Appropriations, thus providing a \$1 million installment to commence the reconnaissance of the economic preliminary study. The Pittsburgh District of the Corps started recon in March 1989, and some of their engineers have toured the 120 mile route twice. This surely is good news!!!

It has been 10 years now since I began to promote a rekindling of interest in an official restudy of the lake-to-river concept, and during the first 6 years I often felt like a lone voice "crying in the wilderness". The project has certainly had its share of controversy during the past six decades, and I am sure it will continue to do so. Nonetheless, this is the first official step toward determining once again the merits of the tremendous economic,

social, commercial, and national significance of this bold plan. Over two hundred years ago President Washington urged this interconnecting waterway, four old towpath canals were built in the 19th century, and the U.S. studied the possibility of a modern waterway starting in 1880, in 1911, 1919, 1924, 1930, 1935, 1939, 1941, 1947, 1965, and now once again. The Lake Erie to Ohio River Canal concept has perennially been among the top 3 most studied and favorably determined possibilities for modern inland waterway improvements in the world! But yet it never became a reality due to shortsighted and self-defeating opposition by special interests, lack of effective political cooperation, adverse national events, and general public apathy and lack of vision. But it's not too late for smart thinking.

I have functioned as part of the steering committee which U.S. Rep. Traficant set up in March 1985, and have worked as voluntary subchairman of the engineering and of the education groups. Soon I will be talking with the Corps of Engineers on several engineering and operational options to suggest improvements or modifications to the plans last determined in 1965. This time around we will be pushing for Ashtabula Harbor, Ohio as the Lake Erie terminus, same as the 1947 report, thus resulting in a 106 mile route from Rochester, PA on the Ohio River, up the Beaver River to near New Castle, PA, up the Mahoning River to Youngstown and Warren, Ohio, and thence through the Grand River valley to Ashtabula. The summit level would be 271 feet above the lake, and the waterway would have between 10 and 14 locks, depending upon specific northern terminus.

For additional information address all inquiries to: Great Lakes Inland Waterway, Inc., P.O. Box 128, Atwater, Ohio 44201, or call (216) 947-3656. In addition, the address of the project's main sponsor is U.S. Rep. James Traficant, 11 Overhill Road, Youngstown, Ohio 44512, phone (216) 788-2414.

We will keep the American Canal Society informed of developments, and I encourage all ACS members to study the merits of this modern proposal for a Lake Erie-Ohio River Canal.

Ron Reid

ACS BROCHURE AGAIN AVAILABLE

Charlie Derr, ACS Secretary-Treasurer, reports that the little ACS brochure is again available in quantity. Members are invited to write him for a supply of them.

American Canals

BULLETIN OF THE AMERICAN CANAL SOCIETY

**“DEDICATED TO HISTORIC CANAL
RESEARCH, PRESERVATION
AND PARKS”**

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

Annual subscription to “AMERICAN CANALS” is automatic with a minimum ACS dues payment of \$12.00. Individual copies may be purchased at \$3.00.

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CANVASS WHITE — HERO OF THE ERIE CANAL (1790-1834)



Canvass White (ASCE Biographical Dictionary)

(Editor's Note: We have recently corresponded with Robert S. White II of Hackettstown, New Jersey, great, great grandson of Canvass White, Erie Canal Engineer. The following account of Canvass White activities in discovering and developing the proper "under-water" cement for the Erie Canal is provided in part by Robert White, as published in "Concrete International" for June 1979, and also from "Towpaths to Tugboats", May 1982.)

Born in Whitestown, New York, Canvass's early education included a year at Fairfield Academy, where he studied mathematics, surveying and engineering. Always in poor health, a sea voyage was recommended for him and he shipped as "super-cargo" on a merchant vessel bound for Russia. He returned in 1812, with greatly improved health, to find his country involved in a second War with Great Britain. In 1814 he organized a company of volunteers, in which he was commissioned a Lieutenant, and participated in the capture of Fort Erie. During the battle he was severely wounded.

In the spring of 1816 he was engaged by Benjamin Wright to assist in final survey work along the route of the Erie Canal. Wright and later De Witt Clinton were so impressed with the enthusiasm and natural ability of the young engineer that they suggested he make a trip to England to collect information there which would help with some of the troublesome details of the Erie. This he did, at his own expense.

He wrote his father from Liverpool in January of 1818: "I have traveled 400 miles (he later covered a full 2000), passed through a number of tunnels and over several aqueducts . . . One aqueduct which I have examined (the Pontcysyllte) conducts a canal across the River Dee in North Wales, and consists of 19 arches of cast iron . . . I shall now make a tour through the North of England."

He returned to the States in the Spring of 1818, with the latest surveying instruments, detailed drawings of English canal operations, and much information on the use of hydraulic cement in construction of English canal locks.

It was Canvass White who solved the problem of an inexpensive supply of hydraulic cement for the Erie Canal. It was not without considerable searching and researching on the part of the young engineer for a good American natural cement that would harden under water — that led him to a deposit of stone near Chittenango, New York. When burned and pulverized this stone produced the desired results. White obtained a patent for his new cement (valid in 1820) and a cement processing plant was set up, under the supervision of his brother, Hugh White, to produce this much needed material for the locks, aqueducts and bridge foundations for the Erie Canal, and later — many others.

On 18 February 1820, the Erie Canal Commissioners reported:

"The water-proof lime, which has been used, during the past season, for most of the mason work done on the canal . . . Mixed with clean silicious sand and water, and well beaten, it constitutes a mortar, which will soon set, and thoroughly cement any work of stone or brick, in which it is used under water . . . We failed repeatedly in burning, pulverising and mixing it; but many trials have now shown us the way to succeed in all these operations. And all the masons in our employ, though for some time they were loth to use it, from an opinion which they uniformly entertained of its being of no value, now regard it as a discovery of the greatest importance. It sets much quicker, and becomes stronger in the air, than common lime mortar; and under water, where a common mortar will not set at all, it begins to set immediately, and in a few weeks acquires great hardness and tenacity. It may be quarried with the same labor as common lime stone, and is known to occur in the greatest abundance, in Madison, Onondaga, Ontario and Genessee counties; its color is a yellowish grey, before it is burnt, and burning inclines it to a buff. It is softer than common limestone, and when burnt, about 10 percent lighter. It will not slack, but must be pulverized by pounding or grinding, and when reduced to powder, its bulk is not materially increased. The quantity of sand mixed with it should be about half that of the lime in bulk. From its not swelling, by being pulverized — from the expense of grinding it, and from the greatly diminished quantity of sand it will bear, it will be at once perceived, that its use will always be attended with greater expense than that of common lime. Still it may be used, at a very small proportion of the cost of any other material now known to answer the same purpose."

As work on the Erie progressed, Canvass White became the chief expert in designing its locks and other appurtenances, which earned him the title of "Principal Engineer."

Before the Erie was complete, White was approached by a number of other canal companies to assist them in their planning and design work. He became a consultant on the Schuylkill Navigation, the Farmington Canal, the Chesapeake and Delaware Canal; and was, for a time, Chief Engineer on the Union Canal, the Delaware and Raritan Canal, and the Lehigh Canal, respectively. Ill health often interfered with his canal projects, and he finally retired to Florida, where he died at the untimely age of forty-four — a great loss to the canal builders of the early Nineteenth Century.

HISTORY OF THE PANAMA CANAL (Part 2)

By William H. Shank, P.E.

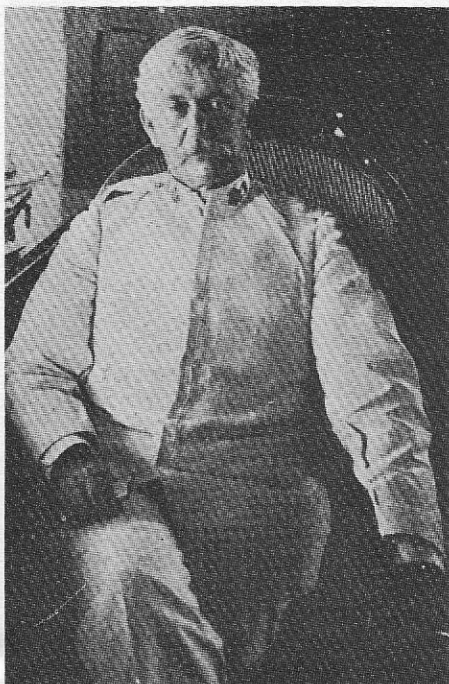
William Crawford Gorgas

The first consideration in the building of the Panama Canal was the health of the vast army of workers which would be shortly laboring in the steaming jungle of inland Panama, with all its tropical diseases — yellow fever and malaria having proven the worst enemies of workers there in the past, on both the railroad and the French canal. The man selected to lead the fight against the jungle diseases was Dr. William Crawford Gorgas, as Chief Sanitary Officer.

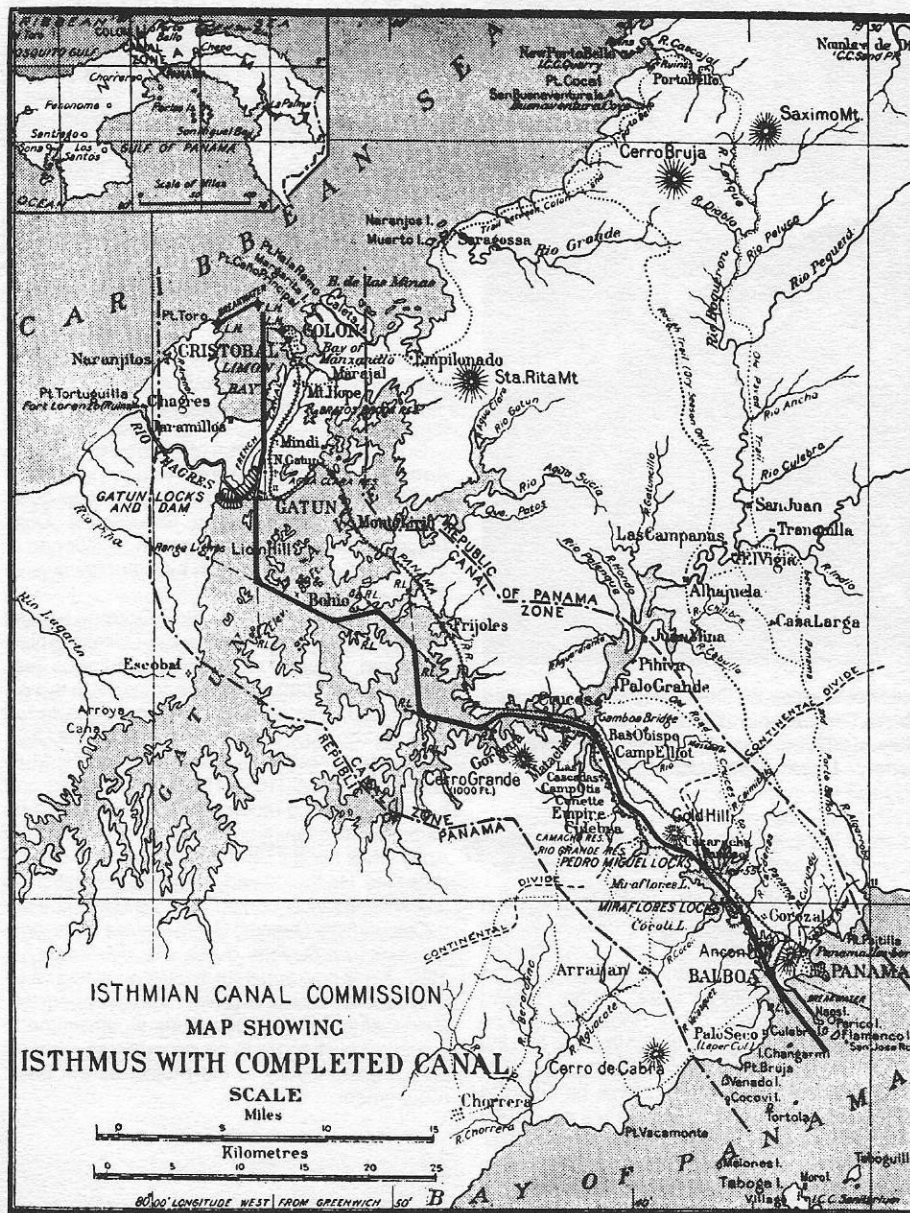
Gorgas' father, Josiah Gorgas, had been a General in the Confederate Army and his son had vivid memories of his mother and family leaving their burned-out home in Richmond near the close of the War and moving to Baltimore, with nothing but the clothes on their backs, while his father went south with Lee's army. Young Gorgas received his education at the University of the South in Sewanee, Tennessee, and Bellevue Medical College in New York, entering the army as a surgeon. In his first assignment, at Fort Brown, Texas he became interested in yellow fever, which he was later to combat and conquer.

During the Spanish-American War, Dr. Gorgas served as Chief Sanitary Officer in Havana, Cuba — for years a notorious center for yellow fever. Here he earned world fame by virtually ridding the city of this disease. He was the first to apply the discoveries of the English Army Surgeon, Dr. Ronald Rose, that malaria is conveyed by the bite of the Anopheles mosquito, and those of Dr. Walter Reed, a surgeon in the U.S. Army, that yellow fever is passed from many to man by the Aedes mosquito. Gorgas' technique was the elimination of the breeding grounds for both types of mosquito, no matter how costly such an operation might be.

In Panama, Dr. Gorgas drained every lake, swamp, pond and ditch that could be drained.



Colonel William C. Gorgas, the man who made the Canal Zone safe for human habitation. ("Panama and the Canal," Willis J. Abbott, 1913.)



Over those that could not be drained, he spread a film of crude petroleum to destroy mosquito eggs and larvae. Within a radius of a hundred yards of all human dwellings, he kept the jungle grass cut to ground level, destroyed all rubbish, rats and vermin. Gorgas raised all buildings on stilts above ground level, screened-in porches, windows and doors and ordered all the inhabitants, to keep vessels of water covered when not in use. He built hospitals for isolation and treatment of any victims of the dread jungle diseases. On each train crossing Panama a medical car was included. City water supplies were cleaned up and sewers were dug. Never had there been such a thorough "purge" of all possible conditions which might lead to disease or death for any of the Americans and other workers on the Canal. By the time the Canal was opened in 1914, Gorgas had reduced the death rate of the 39,000 employees in the canal zone to a mere 17 per thousand, from all causes — lower than the normal death rate in most American cities of the period.

Without the work of Dr. Gorgas, the building of the Panama Canal would not have been possible. Already a Colonel by act of Congress, for his work in Havana, Dr. Gorgas was promoted to Surgeon General of the U.S. Army in 1914, and the following year was made Major General.

The First Chief Engineers

John Findley Wallace was selected as the first Chief Engineer of the Panama Canal project, under the watchful eye of a Canal Commission of seven in Washington, who carefully controlled delivery and costs on all materials bound for Panama. Wallace complained later of endless "red tape" and "lack of a free hand" as he had been promised, but actually he was not the man for such a colossal job. To begin with, he hated life in Panama, was deathly afraid of contracting one of the tropical diseases, and never really was able

(Continued on Page Four)

HISTORY OF THE PANAMA CANAL (Part 2)



Colonel George W. Goethals, the undisputed "boss" of all operations in the Canal Zone, after 1907. ("The Story of the Panama Canal," Logan Marshall, 1913)

(Continued from Page Three)

to formulate an effective plan of attack for building the canal. He dabbled with repairs to the machinery left behind by the French, supervised some of the excavation work at Culebra Cut and complained constantly to "Boss" William Howard Taft, Secretary of War under Roosevelt, that he was being ham-strung by the Commission and the endless paper work of obtaining necessary supplies for the job site. Taft did what he could to simplify the procurement procedures and finally even cut the size of the commission to three people. However, when Wallace came to Washington to say that he could find a better job elsewhere, Taft promptly fired him.

Taft, whom Roosevelt had now placed in charge of the Panama Project, then hired another civilian engineer, John F. Stevens, in July of 1905. Stevens, primarily a railroad engineer, proved to be a brilliant addition to the project and got things moving almost at once. He brought in some of the most modern earth-moving machinery in the form of giant steam shovels, recently developed in the USA. He rebuilt whole sections of the Panama Railroad, and imported larger rail cars to carry dirt and rock away from the digging sites as rapidly as the steam shovels could load them.

He took full advantage of the partially completed work of the French. Stevens recognized at once the importance of the work that Dr. Gorgas was doing, and gave him every possible assistance in the development of new sanitation facilities and insect-free housing for the inhabitants of the Canal Zone.

To this point no decision has been made as to whether the Canal was to be a sea-level cut, or a lock-canal. A group of engineers, some of whom had worked on the Soo Locks, were sent down to Panama, and they convinced Stevens that a

lock-canal was necessary. Stevens became the most ardent proponent of a lock-canal at later Congressional hearings on the matter. Stevens was a bundle of energy and seemed to be everywhere, directing the work in a competent and efficient manner. Everything seemed to be going well.

Then suddenly, on January 30, 1907, Stevens (for reasons still not clear) wrote a letter directly to President Roosevelt saying, in effect, that he was not really interested in the entire project, did not really like the work, and wished that he had taken a position back in the States instead. While the letter was not actually a resignation, Roosevelt took it as such, and wired Stevens that his resignation was accepted.

George Washington Goethals

On the recommendation of William Howard Taft, Army Major George Goethals was summoned to the White House and told that he was to go to Panama to replace John Stevens as Chief Engineer and was also to be made Chairman of the Canal Commission, with full authority over all affairs in the Canal Zone.

Born in Brooklyn, N.Y. in 1858, Goethals worked his way through three years at City College of New York and entered West Point, where he was graduated in 1880 and chose to serve in the Army Corps of Engineers. His career had included work on improvements to navigation on the Ohio, Cumberland and Tennessee Rivers. On the Muscle Shoals Canal (1889-1894) he designed and built a lock with a record lift of 26 feet. When he came to Taft's attention he was a member of the Army Chief of Staff Corps, specializing in coastal defenses. He had already earned a reputation as an expert engineer and an inspiring leader of men.

Colonel (later General) Goethals went to Panama and took over Stevens' duties, effective March 31, 1907. It was now apparent that the army had taken over, and a number of civilian staff members left, shortly after Stevens' departure. Goethals made a number of changes to his general staff, insisting on complete loyalty to the project as the basic requirement.

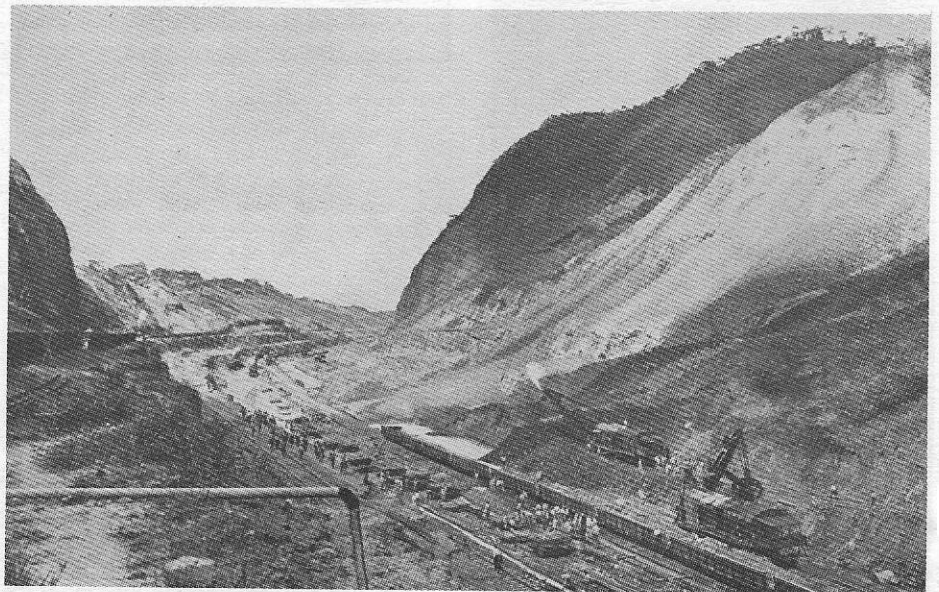
In his capacity as both Chief Engineer and General Superintendent of all Canal Zone affairs, Goethals was first regarded as a "cold fish," but he soon gained the respect of his subordinates and the populace, as a man who was willing to hear all sides of a question, and who was extremely fair and impartial in his judgments. He divided his time between the office and the actual construction sites, touring the Zone on a special motor-driven car that ran on railroad tracks — which his men nicknamed "the Brain Wagon." By driving himself and his men he completed the canal one year ahead of schedule.

And so, the greatest construction project of all time was carried through to completion by the Army of the United States, under the guidance of the man who became known as the "Benevolent Despot" of the Panama Canal — the undisputed "boss" of the entire operation, in all its ramifications, responsible only to the President of the United States.

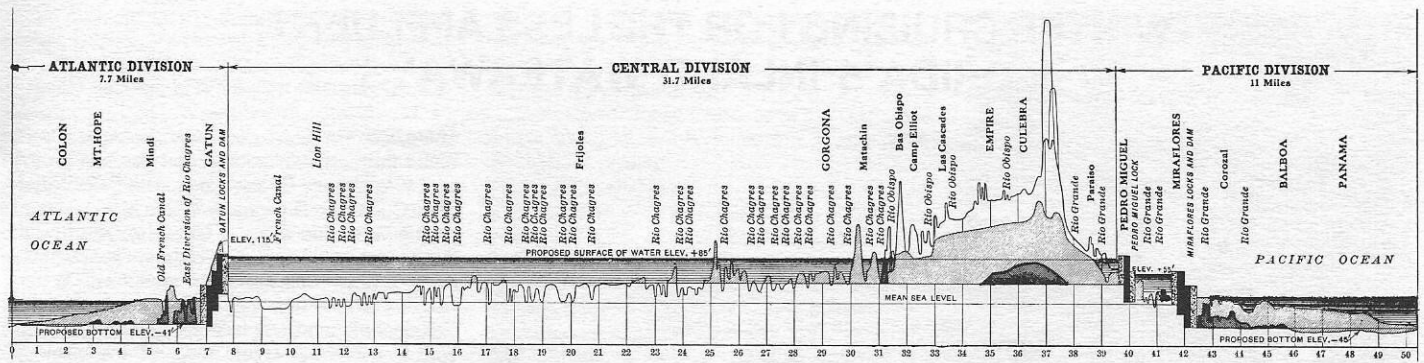
Construction

After it had been decided that the canal was to be a lock-canal rather than a sea-level canal, an artificial lake was planned as part of the summit level — Gatun Lake. To create this lake, the world's largest dam was built across the Chagres River at the Caribbean end. The Lake was then extended across the Continental Divide at Culebra with a "cut" at a much higher level than would have been necessary with the sea-level plan. This meant much shallower excavation. In view of all the difficulties with land slides which later developed at Culebra this turned out to be a wise decision.

Ships were to be raised to the Lake Gatun level, 85 feet above sea level, by three lock-sequences at both the Atlantic and Pacific end of the summit. The first locks were a flight of three passing the Gatun-Lake Dam; the next was single — at Pedro Miguel; and the last, a two-flight lock sequence at Miraflores — to drop the ships to the Pacific Ocean level. Because of the heavy traffic which was anticipated, it was decided early in the planning, to make all locks double and all of them identical in size — 1000 feet long by 110 feet wide. Thus, twelve huge concrete locks — larger than



Culebra cut on January 4, 1913, just after a land slide. Note huge track-mounted steam shovels at the right. ("The Panama Gateway," Joseph Bucklin Bishop, 1913)



A profile of the Panama Canal, showing the location of the six locking sequences, the Gatun Lake level, the excavation necessary through the Culebra section, the small lake section at Miraflores, and the additional excavation necessary in the Pacific channel to provide an average channel depth of 45-feet. (From "Panama and the Canal" by Willis J. Abbot, 1913)

any in the World, were soon being built in the jungles of Panama, along with the world's greatest dam (a half-mile wide and 1-1/2 miles long) and a nine-mile cut through a mountain. Such a project had never been undertaken before, anywhere!

The gates of the locks were all mitretype and all driven by huge electrically-operated gear and pinion mechanisms. Power for the locks was supplied by a hydro-electric generating plant which utilized the 85-foot "head" at Gatun Dam for this purpose and also supplied power to the communities created along the route by the Americans. Electric locomotives were installed to tow all ships through the locks.

The Panama Railroad was rebuilt and relocated so that it would not be submerged by the back-up water from Gatun Dam. Railroad tracks and equipment (developed by Stevens) were an important part of the construction operation, particularly in the Culebra Cut, where huge steam-shovels, and the cars that they loaded — all moved along on tracks as the work progressed. Concrete-mixing and pouring equipment for the locks and dams, of tremendous size, moved on tracks to their work sites. Building materials flowed into the project by rail from huge unloading docks on both the Atlantic and Pacific.

Major troubles were encountered at the Culebra Cut, both during and after construction, when cave-ins and slides developed in the unstable

ground of the mountain at that point. But the American workers doggedly cleaned out the huge volumes of extra ground, and widened the cut to keep it open, on each such occasion. During the work at Culebra, a temporary dam was built to prevent the waters of Gatun Lake from spilling over into the cut after the Dam was completed. This was known as "Gamboa Dyke."

A dramatic celebration took place, on the afternoon of October 10, 1913, when President Woodrow Wilson in the White House, pressed a telegraph key which actuated a huge charge of dynamite, destroying Gamboa Dyke and uniting the waters of the Atlantic and Pacific for the first time. The ceremony took place exactly 400 years to the day (October 10, 1513) after Balboa strode waist-deep into the Pacific Ocean to claim that body of water, and all neighboring countries, for Spain.

Formal Opening

The Panama Canal was formally opened to commercial traffic on August 15, 1914. The first ship through the Canal was the U.S. government vessel "Ancon," carrying officials and other guests of honor. In view of the fact that the First World War had begun just days earlier in Europe, the mood was somber and formal celebrations brief. All involved were fully aware of the world-wide

significance of the new Canal and the extreme importance of its protection.

The Panama Canal, crowning achievement of any nation at any time in world history, had finally been completed by the United States at a cost of approximately \$375,000,000, including our payment to the French company, and the cost of sanitary preparations. The total amount of earth and rock excavated had been 239,000,000 cubic yards. Total length of the Canal — 50.7 miles. Average depth — 45 feet. Height of Gatun Lake, 85 feet above sea level; height of Miraflores Lake, 54-2/3 feet above sea level. Time for a vessel to pass through the Canal — six to eight hours. Distances saved: New York to San Francisco, 7878 miles; New York to Yokohama, 3768 miles; New Orleans to San Francisco 8869 miles; Liverpool to San Francisco, 5666 miles.

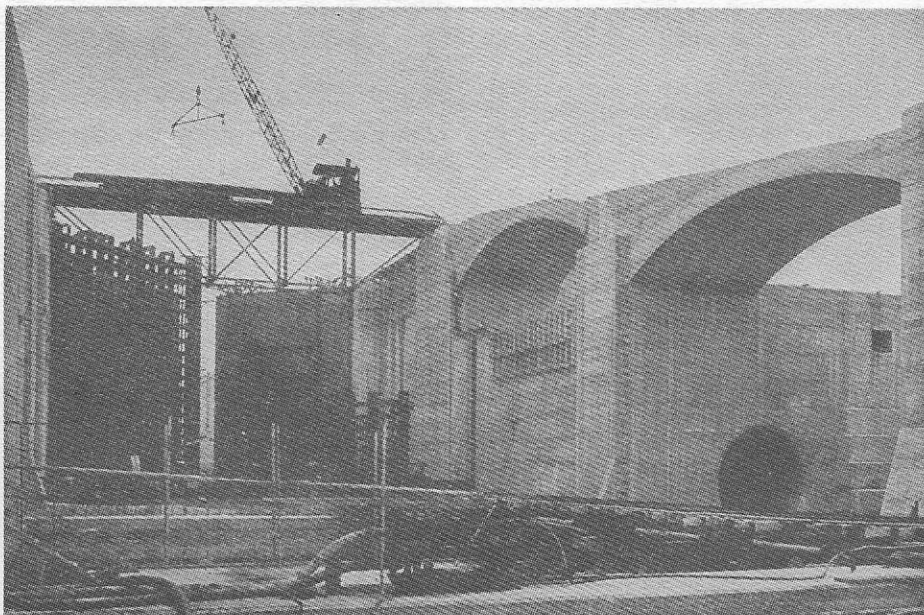
A ship entering the Canal from the Caribbean proceeds past Colon, through Limon Bay, a distance of seven miles to the flight of triple locks at Gatun, where it is raised 85 feet, to Gatun Lake. It then travels for 24 miles across Gatun Lake, entering the Culebra Cut (now re-named the Gaillard Cut) at Bas Obispo, traveling nine miles through this artificial channel (300 feet wide at the bottom) to Pedro Miguel Lock. Here the ship is lowered 30-1/3 feet to Miraflores Lake, along which it travels for one and one half miles to the double-flight of Locks at Miraflores. Here it is dropped the remaining 54-2/3 feet to tide-water and proceeds for another 8-1/2 miles, past the city of Panama, to the Pacific Ocean.

Madden Dam

In 1938 Madden Dam was constructed further upstream on the Chagres River and about nine miles from the Canal, to provide additional water reserve for the Canal and additional hydro-electric power for the Canal Zone. In 1939 Congress granted funds (in view of Hitler's activities in Europe) for the strengthening of the defenses of the Canal and the construction of a third set of single-chamber canal locks 3000 feet from the original pairs of locks. These plans were never carried out, due to navigational hazards and the sharp turns which would have been required for vessels traveling the new locks. In 1942 a highway was opened between Colon and the city of Panama, to supplement the old Panama Railroad route. Shortly afterward the Navy built twin fuel pipe lines between Cristobal and Balboa.

Plans are still being discussed for the building of a new sea-level canal across Panama, as well as a second canal across Nicaragua.

However, one wonders about the present plan for turning over the original Panama Canal to the unstable government of Panama, at the close of the Twentieth Century.



Construction of the Pedro Miguel Locks. Tremendous concrete "pourings" were required. ("The Story of the Panama Canal," Logan Marshall, 1913)

WINTER CRUISING FOR THE LESS AFFLUENT: FLORIDA'S INLAND WATERWAYS



Locks on the Kissimmee Waterway are smaller than those on the Okeechobee, and their operation is more informal. Don't wait for a green light to enter — a friendly hand signal from the lock tender is what you're most likely to get.

By David F. Ross
(Photos by Mary C. Reyes)

During the warm months of the year, there is a classless society among boaters which almost justifies the extravagant claims of the Declaration of Independence — all were created equal in their pursuit of happiness. Whether your vessel is a two-million dollar yacht or a homemade plywood cruiser, on the Ohio, the Mississippi, or whatever inland waterway you travel, you stop at the same marinas, you suffer the same lockage delays, taking equal second place to commercial traffic, and you share the same weather, good or bad. Come autumn, however, and class reasserts itself as the great discriminator in human affairs. It is then that the yachts move down to the Gulf, the Caribbean, the Bahamas, or yet more exotic tropical waters, to continue their cruising abroad until spring calls them back to their native inland waterways. It is then, too, that the homemade cruisers come ashore on their trailers and go into the backyard to hibernate. Now the sheep are separated from the goats, and the cheap from their boats, in a kind of navigational day of judgment. It need not be so, however. That homemade cruiser might not make it to Jamaica or the Virgin Islands, but it can be kept cruising through the winter by utilizing the extensive inland waterway system of Florida. On portions of the system, you'll even meet some of your yachting buddies from last summer.

Our 21-foot Lonestar cruiser, the *Rosa Parks*, is not homemade, but is totally unsuitable for the Gulf, the Caribbean, or any other kind of ocean cruising. Thirty-five years old with an aluminum hull, she has enough trouble remaining afloat without exposure to the corrosive effects of salt water. As shallow of draft as a paddle-wheel steamboat, she would bob and sail like a leaf in the wind on waves of the high seas. A large lake is a serious challenge for her. Once a year, usually

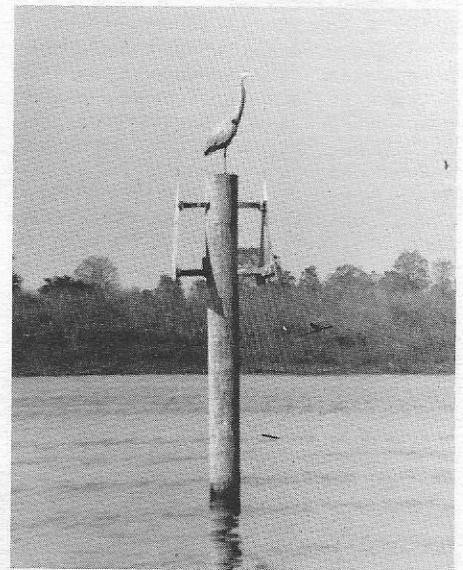
during December and January, we put her to the test, while asserting our own democratic right to the pursuit of aquatic happiness, by cruising the Kissimmee and Okeechobee waterways.

The Kissimmee Waterway begins at the city of Kissimmee, at the northern end of Lake Tohopekaliga, and extends 97½ miles south to the mouth of the Kissimmee River on Lake Okeechobee. After passing through a lock at the southern end of Lake Tohopekaliga, it proceeds by canal to Cypress Lake, across Cypress and then by canal to Lake Hatchineha, across Hatchineha and then by canal to Lake Kissimmee, and down the length of Lake Kissimmee to a lock which gives access to the Kissimmee River. The remaining 56 miles of the water way is the Kissimmee River, with five additional locks to pass through along the way.

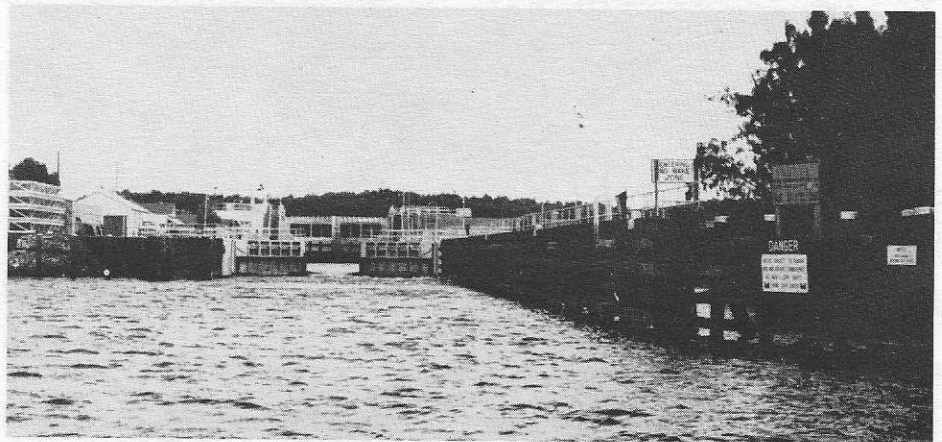
The Okeechobee Waterway crosses the peninsula of Florida from Stuart, at the mouth of the Saint Lucie River on the Atlantic, to Fort Myers, at the mouth of the Caloosahatchee River on the Gulf

of Mexico. The Saint Lucie Canal carries it from Stuart through two locks to Port Mayaca on the east side of Lake Okeechobee. The Caloosahatchee Canal and River carry it from Moore Haven on the west side of Lake Okeechobee through three locks to the Gulf. The distance is 135 miles from the Saint Lucie Inlet to the Intracoastal Waterway to where highway U.S. 41 crosses the Caloosahatchee River in Fort Myers. If you also wish to avoid salt water, however, the distance from the Saint Lucie Lock in the east to the W.P. Franklin Lock in the west is about 107 miles. This includes a 25-mile crossing of Lake Okeechobee. The lake also enters into the picture in two other ways: it is the connecting link between the Okeechobee and the Kissimmee waterways; and it is an extensive body of water for cruising in its own right.

Lake Okeechobee is the second largest freshwater lake within the boundaries of the United States. This statement has been carefully worded, and it must be read with care. It excludes Great Salt Lake, which is larger, because it is not fresh water. It excludes lakes Superior, Huron, Erie, and Ontario, which are larger, because they are on,



A great blue heron guards the entrance to Lake Hatchineha.



The Moore Haven Lock gives access to the Caloosahatchee Canal as you cruise west from Lake Okeechobee.

rather than within, the boundaries of the United States. Granted those exclusions, Okeechobee is second in area only to Lake Michigan. It is actually a distant second, and it would probably be surpassed in size by a number of other American lakes if the measure were volume rather than area. Still, it is of impressive size. From the practical point of view of human perception, it is as big as the ocean, since you cannot see across it. It is enough of a challenge to the *Rosa Parks* so that we generally wait for a calm day and then cross it as quickly as possible. Someone with a different boat or a more highly developed spirit of adventure could devote a great deal of time to its exploration without exhausting its possibilities.

Altogether, then, the Kissimmee and Okeechobee waterways combined offer well over 200 miles of cruising opportunity, with 12 main-channel locks (there are also a number of locks giving access to places bordering Lake Okeechobee). Cruising these waterways, you will meet bass boats, houseboats, cruisers, trawlers, and yachts. Occasionally, you will meet a dredge or a tour boat. A

safe bet is that you will never meet a commercial tow. Why, then, given U.S. government policy on navigable waterways, do these routes exist, and why are they maintained?

Navigation on these routes, other than by canoe and similar craft, began in the 1880s as a result of the efforts of Hamilton Disston. The son of Henry Disston, the immigrant manufacturer of Disston saws and files, Hamilton had visited Florida on a fishing trip in 1877. Like many others, he became obsessed with the idea that the millions of acres of swamp and marsh land in South Florida could be transformed into extraordinarily fertile farmland by drainage. In 1878, his father fortuitously died, leaving Hamilton, unlike many others, with the means to give expression to his obsession. In 1881, he entered into two contracts with the state government's Internal Improvement Fund, an agency which despite its name was glutted with land but starved for cash. In one contract, Disston undertook to drain all the land watered by Lake Okeechobee, the Kissimmee River, and the lakes connected with the Kissimmee River. In return, he

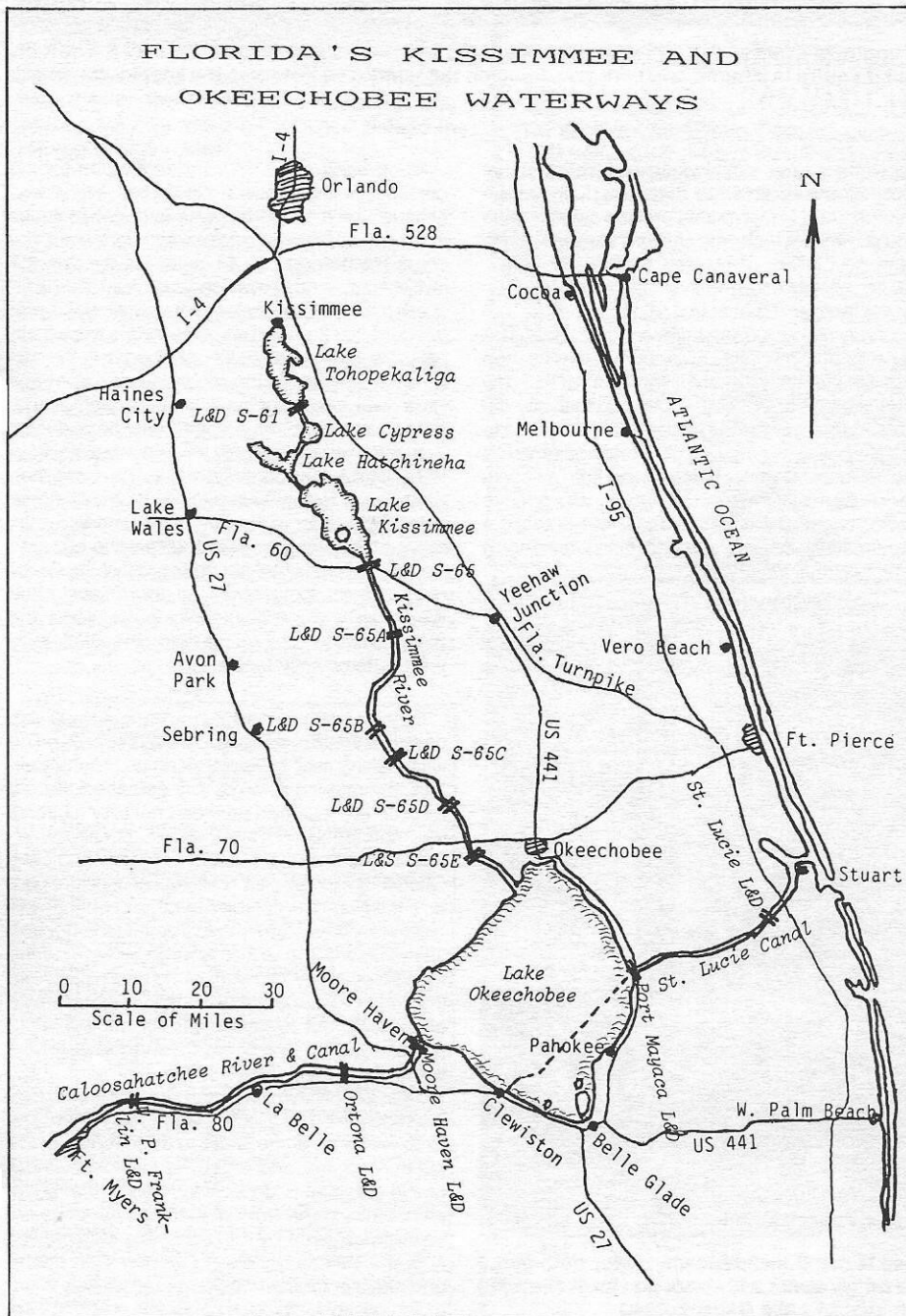


A common egret is the unofficial harbor-master at the Lake Kissimmee State Park docks.

was to receive half of that portion of the reclaimed land which was or would ever become the property of the state — a deal which could eventually have netted him 7 million acres, or more if the state received further federal land grants. In the second contract, he purchased outright 4 million acres at 25 cents per acre — just enough to save the Internal Improvement Fund from bankruptcy.

Disston's end was drainage, not navigation, and his means was dredging. The natural egress of water from South Florida lakes is by seepage — hence, the Everglades. By dredging channels, Disston converted gradual seep to rapid flow, lowering the levels of the lakes and drying the adjacent land. A secondary benefit, however, was that the dredged channels were navigable, even though in the absence of locks and dams they were subject to considerable seasonal variation. Disston did not achieve his purpose of completing a drainage channel from Lake Okeechobee to the Atlantic (the present Saint Lucie Canal), but he did complete the channel via the Caloosahatchee River to the Gulf at Fort Myers, as well as the Kissimmee River channel from Lake Tohopekaliga to Lake Okeechobee. Thus, continuous steamboat navigation became possible, in 1884, between the wide world, via Fort Myers, and the little community of Kissimmee at the head of Lake Tohopekaliga. In 1881, there was one house in Kissimmee. By 1882, there was a post office; by 1884, a public school; and the 1890 census recorded an urban population of 1,086. Steamboat traffic continued into the 1920s, by which time railroads and highways had developed sufficiently to make the small steamboat obsolete. It was at about this same time that the state finally completed the Saint Lucie Canal, providing drainage and, incidentally, navigation, from Lake Okeechobee to the Atlantic.

(Continued on Page Eight)



Unusual hazards — or attractions — are involved in locking through on Florida waterways.

CRUISING FLORIDA'S INLAND WATERWAYS

(Continued from Page Seven)

Although the reclaimed land of South Florida was not the agricultural bonanza that Hamilton Disston and other visionaries had imagined, it was an exploitable resource. Investment and settlement followed rapidly wherever drainage occurred, creating a new problem: flood control. Lake Okeechobee might now seem in years of normal rainfall to have been tamed, but it was not. The difference was that now when it overflowed its banks it did more than create a habitat for waterfowl and alligators — it also destroyed crops, structures, and human lives.

It was the hurricanes of 1926 and 1928 that brought in the federal government to cope with the monster that state and private enterprise had spawned. High water and huge waves conspired to wash out dikes, especially along the south shore of the lake where settlement was heaviest. Four hundred died in the 1926 flood in Clewiston and Moore Haven, and 2,000 more in the 1928 flood. Congress responded to the anguished pleas of the survivors with authorization for the Corps of Engineers to take matters in hand. Congress was still at that time, however, uncertain about the propriety of multipurpose waterway projects or involvement of the corps in anything other than navigation projects. Corps of Engineers flood control work had by now reluctantly been authorized on the Mississippi and Sacramento rivers, but it was still considered to be daring and exceptional if not actually illicit. Accordingly what Congress authorized for the Okeechobee Waterway was a navigation project with a broad hint that the corps should execute it in such a way as to maximize the incidental flood-control benefits.

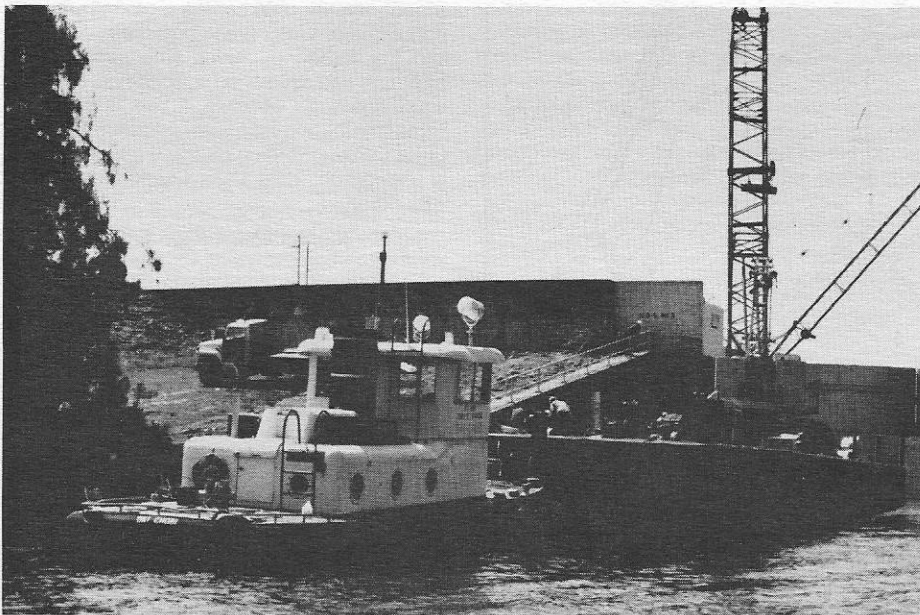
This explains a mystery that still puzzles boaters on the Okeechobee Waterway. Between Port Mayaca on the east shore of the lake and Clewiston on the southwest, the Okeechobee Waterway has two routes. Route 1 crosses the lake more-or-less directly in about 25 miles; route 2 skirts the coast, taking about 35 miles to complete



If you're in a hurry, check the depth gauge at the weir — you may not need to take the detour. But if you're in a hurry, what are you doing on the river? The detour is the scenic way to go.

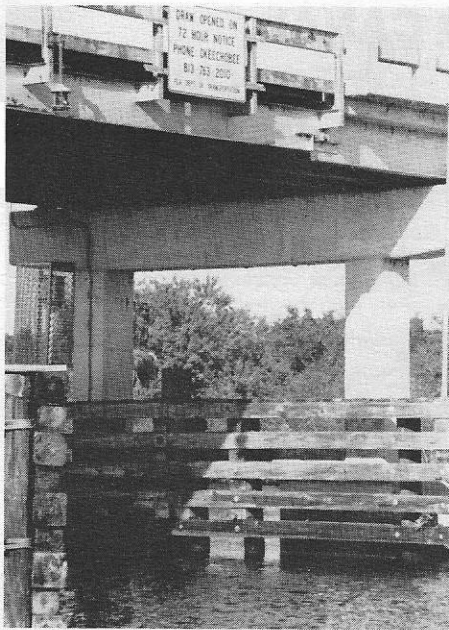
the same journey. An obvious explanation is that route 2 is the sheltered route for use during rough weather, and in fact it does provide considerable and sometimes welcome shelter between Pelican Bay and Clewiston. The first 15 miles, however, are completely exposed to whatever is kicking up on the lake, and a boat in trouble there is at considerably higher risk than one on route 1 because of being only moments away from being dashed against the rocky shore. The fact is that the engineers dredged route 2 first, and that they did it not for the sake of the channel but for the sake of the spoil — the dredged-up material of which the levee was constructed along the adjacent shore. By 1937, the entire waterway was open to traffic, ostensibly a barge canal but actually a clandestine flood control project masquerading as a recreational waterway.

Flood control was also the motivation for the creation of the present Kissimmee Waterway, although by the time this was undertaken it was no longer considered an improper concern of the corps. Recovering from \$4 million in flood damage in 1947, cattle ranchers and land developers persuaded the corps to include Kissimmee flood control in its 1948 plan. This won congressional approval in 1954, and actual work began in the early 1960s. By 1971, the meandering Kissimmee River had become Canal 38 — straight, wide, deep, and about half the length of the original river. Perhaps because navigation was never pretended to be its primary purpose, the works were then turned over to the South Florida Water Management District for operation. One conspicuous, although probably transient, difference between the two systems of administration is that the Corps of Engineers locktenders on the Okeechobee Waterway are predominantly male while the SFWMD locktenders on the Kissimmee Waterway are predominantly female.



If you should see a tow, chances are its business is canal maintenance rather than cargo carrying. Here a Corps of Engineers towboat and barge assist with work on Hurricane Gate 3, the entrance to the Miami Canal on the south side of Lake Okeechobee.

Even before the new Kissimmee Waterway was open for business, a ground swell of opposition was making itself felt as far north as Tallahassee. The meandering and marshy course of the old Kissimmee River had provided not only a habitat for innumerable species of wildlife, but also an efficient filtration system for the water entering Lake Okeechobee. The new river was an efficient conduit, flushing not only the run-off of chemical and organic fertilizers from the reclaimed land but also the effluent of the urban sewage systems of the Kissimmee-Orlando-Disney World area directly into the lake. Developers and conservationists might argue over the relative merits of marshland or pasture, but no one could defend the degradation of the central water resource for all of South Florida. Weirs have now been constructed between the second and third locks below Lake Kissimmee, to divert some of the water to the oxbows of the old river course, and a study of the effectiveness of this measure is under way. So far, the movement to undo the work of the engineers has not interfered significantly with the navigational capacity of the waterways. Even the most avid boater and canal enthusiast could not reasonably claim a high priority for through navigation on the Kissim-



Fewer yachts are encountered on the Kissimmee than on the Okeechobee waterway. One reason may be the programmed delays in raising bridge spans.

me, but we can hope that it will remain an ancillary benefit when the State of Florida has attended to its primary concerns.

It is certainly possible to effect compromises between navigational and conservational interests, so that the wonders of nature are not only preserved but also made accessible to human observation. This is possible because one of the wonders of nature is its remarkable resiliency. According to the U.S. Fish and Wildlife Service, the canalization of the Kissimmee had a devastating effect on the populations of both resident and migratory birdlife, yet the great blue heron, anhinga, common egret, gallinule, wood ibis, and bald eagle are only a few examples of the boater's everyday companions. The tolerance of wildlife for human intrusion should humble and instruct all of us. Nowhere could it be more vividly represented than in the wonderfully and terribly designated

QUIMBY'S BOATING GUIDE

The new *American Canal Guide* has the wrong address for *Quimby's Boating Guide*. It is now published by the *Waterways Journal*, 319 N. 4th St., St. Louis, MO 63102. The latest edition of the boating guide has new sections on the historic Kentucky and Muskingum river navigations (and a plug for ACS), written by David Ross of the ACS Navigable Canals Committee. Copies are available in marinas @ \$10.95 or by mail from *Waterways Journal* @ \$12.45 ppd.

Note also that the price for the *Waterways Journal* is now \$26 a year. This weekly publication has been the "Bible" of America's commercial inland waterways for over a century, since it began in 1887.

The ACS Navigable Canals Committee welcomes your assistance and suggestions. Get in touch with the Chairman, David Ross, at his new address, Rural Route 1, Box 87T, Savannah, TN 38372.

"Avon Park Bombing Range and Wildlife Management Area" between locks S-65A and S-65B.

The interconnected waterways are well supplied with facilities for boaters, both public and private. The South Florida Water Management District maintains two parks, one at the foot of Lake Tohopekaliga and one where the Kissimmee River empties into Lake Okeechobee. There is a state park in the northwest corner of Lake Kissimmee and another at Pahokee on the southeastern side of Lake Okeechobee. The city of Kissimmee has recently opened a protected harbor for public use. The shopping districts not only of Kissimmee but also of Clewiston and Moore Haven are readily accessible to their respective ports, when supplies beyond the capacity of the numerous marinas and fishing camps are required.

At least for us, however, the main attraction of the Florida inland waterways is not their access to the comforts and conveniences of civilization,

but the illusion which they foster of having left civilization far behind. Especially on the Kissimmee and Caloosahatchee river sections there are countless oxbows and other natural harbors where you can anchor for overnight or for a week or two and imagine that you are alone in a world of exotic birds, alligators, otters, fish, turtles, and mostly benign insects. Occasionally a bass fisherman will intrude upon your sanctuary, but they are generally so intent upon their business as to make you feel invisible. So what if more affluent fellow boaters are discovering deserted cays in the Bahamas or uncharted South Pacific atolls? There are Gardens of Eden closer at hand for the inland boater.

Nautical Chart 11428 may be purchased from the National Ocean Service of the U.S. Department of Commerce for the Okeechobee Waterways. The South Florida Water Management District provides a free map of the Kissimmee Waterway.

Pennsylvania Profiles

by Patrick M. Reynolds

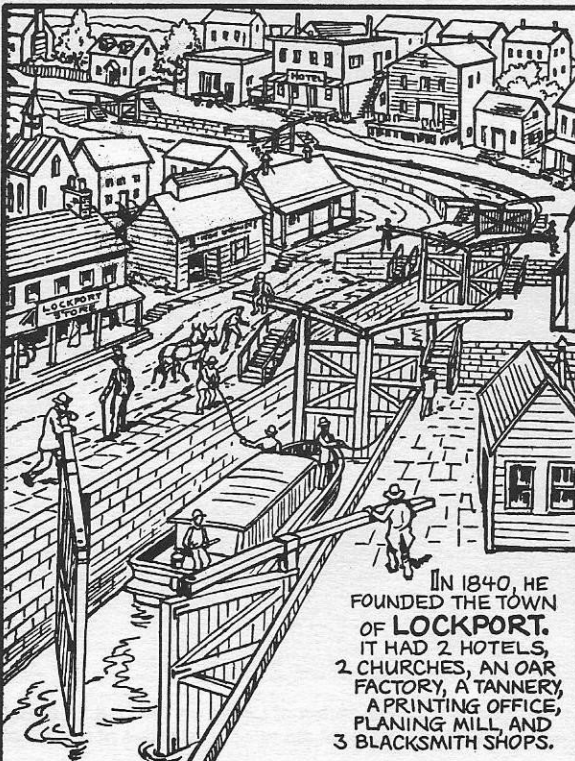
The Pennsylvania Profiles Collection

The most recent five volumes of the PA Profiles Collection are available in a handsome slipcase for \$17.30 postpaid. Make check or money order payable to PA Profiles and mail to Editorial Secretary, Patriot-News Co., PO Box 2265, Harrisburg, PA 17105.

SILAS PRATT'S BOOM TOWN

THE ERIE EXTENSION CANAL, LINKING PITTSBURGH WITH LAKE ERIE, WAS COMPLETED IN 1844. SEVENTEEN MILES SOUTHWEST OF ERIE THERE WAS AN AREA WITH 28 LOCKS WITHIN 2 MILES.

SILAS PRATT NOT ONLY OWNED THIS LAND, HE HAD THE CONTRACT TO BUILD THE LOCKS. HE ALSO FIGURED THE AREA WOULD BE AN IDEAL SITE FOR A TOWN.



IN 1840, HE FOUNDED THE TOWN OF LOCKPORT. IT HAD 2 HOTELS, 2 CHURCHES, AN OAR FACTORY, A TANNERY, A PRINTING OFFICE, PLANING MILL, AND 3 BLACKSMITH SHOPS.



PRATT WENT BROKE IN 1849 AND NEVER FINISHED THE TOWN. A FEW YEARS LATER THE CANAL WAS ABANDONED. EVENTUALLY THE LARGER BUILDINGS BURNED DOWN. TODAY, LOCKPORT IS A SMALL FARMING COMMUNITY NAMED PLATEA.

OLD MAN — OLD BIKE — OLD CANAL

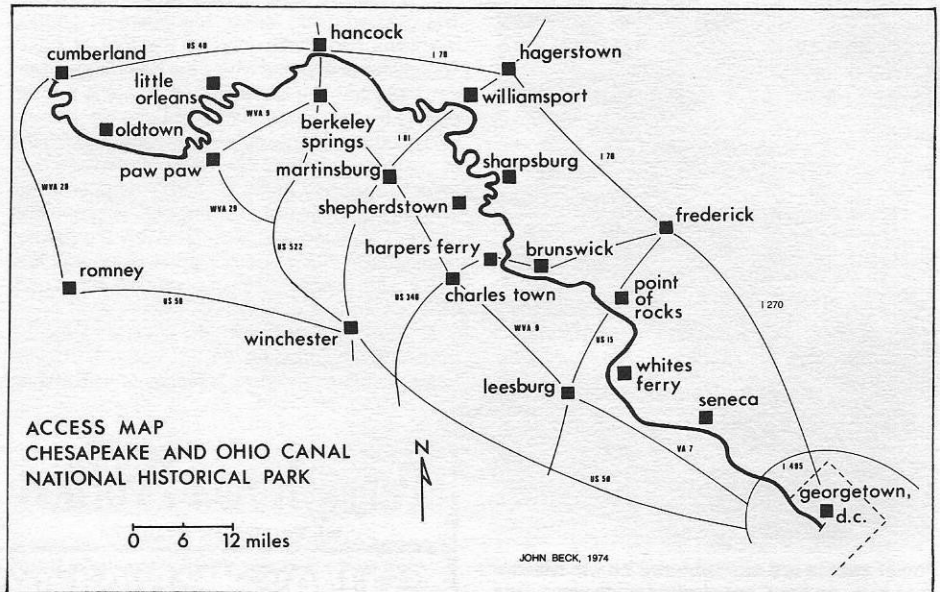
By Alan Mead

The morning was bright and warm on Thursday (April 20) as I departed on my long awaited bicycle trip on the C & O Canal. As Gretchen had left to visit daughter Kim in San Francisco, I was on my own to arrange transportation. As I wanted to bike the 184.5 mile towpath only one way, from Cumberland to Georgetown, I headed to Cumberland. After a short stop at the visitors' center I was on my way, from the Cumberland Basin at 11:30, meeting only a few bikers and walkers in the first few miles - then none in the next 40 miles I was to bike before stopping for the night.

Most of this stretch on the canal is "dry" but with enough water to support a multitude of turtles, all of whom I think were sunning themselves on this nice warm spring day. Trees are still in bud, but wildflowers abound, especially the Virginia bluebells - masses of them for miles along the towpath. Today's most interesting canal feature had to be the Paw-Paw Tunnel, with its 6 million bricks, - "in new" condition although 150 years old. A two mile trail over the tunnel is rough & steep & hikers & bikers are advised by sign to stay on the trail. Later I was to find out it's o.k. to walk bikes thru the tunnel using a flashlight. Overnight was at "Devils Alley" one of the 5 mile-apart campsites. These campsites are well provided for with tables, fireplace, porta-let toilets and the hardest working hand pump you can imagine. The campsites are only for hiker/biker use. Enjoyed watching two beavers in the river just at dusk.

Up early Friday after a cool but comfortable night, biking into Hancock by 10 A.M. Just as I came out to the boat ramp area I met a couple of bikers who were being "dropped off" to return northward on the towpath, so I was able to hitch a ride back to Cumberland with their "driver". After retrieving my truck I left my bike at a hardware store in Hancock and drove to Williamsport, leaving the truck there and hitching back to Hancock, where I was back on the towpath at 2:30 P.M. Thought I was going to get rained on but only sprinkles for a few minutes.

At "Four Locks" I met up with the "Justice Douglas" hike group of 40 - they hike the entire towpath each year to honor Justice Wm. O.



The above map is provided courtesy of Capt. Thomas F. Hahn, Shepherdstown, W. Va., the author of the "Towpath guide to the C. & O. Canal". This is the frontispiece illustration in his Guidebooks.

Douglas, who was instrumental in having the canal preserved as a national historical park. "Four Locks" has a nicely restored area with several canal structures. Most of the locks on the canal are in good shape, except of course for the wooden lock gates.

Now it's late Friday afternoon, I'm at Williamsport, with bike, gear and truck - after a good day of biking 45 miles.

Overnight Friday at the American Youth Hostel in Knoxville, Md. - across the river from Harper's Ferry. Almost a full house and lots of activity. Visited with a youth group from D.C. who were mostly Central & So. American, now living here (D.C.). Other outdoor people overnighing here too. Saturday morning I was helped with transportation by Don McCarty, a canoeist from Pittsburgh, a "Fellow Hosteler". He left me at Williamsport to bike the 40 miles down to the hostel and he returned with my truck to the hostel. Only road "detour" of the entire canal is on this section - about 10 miles

of road just above Dam 4. It's another splendid day and lots of fishermen, hikers, walkers and bikers out - especially on the section from Shepherdstown to Harper's Ferry. Towpath is all in good shape - recently re-graveled in many sections - rode along with a fellow on a \$600 bike, who informed me of our average speed - 8.5 mph.

Still lots of flowers and a few more leaves out. Without camping gear it was an easier trip. Back at the hostel mid-afternoon and time for a trip to the supermarket to stock up on food for a nice steak dinner Sat. night, plus breakfast Sunday.

Sunday morning is cool, clear and crisp. Again at the hostel I was able to enlist the help of a scout leader to leave me at "Point of Rocks", some twelve miles down the towpath and again bring the truck back to the hostel, which I returned to via towpath.

By noon I had completed this section and returned to "Point of Rocks" to start on the final 48 miles to Georgetown. The towpath & canal thru this area is more remote, - away from the railway which has been nearby for many miles. Passed over the Monocacy River aqueduct (largest on the canal). At White's Ferry there is still an operating ferry service - for the next twenty miles I was to encounter several horse-rider groups - generally lots more people. A nice Sunday afternoon and closer to Washington, too. More wildflowers, especially Woodland Phlox. Set up camp at Horsepen Branch, the last hiker/biker campsite going towards Washington. Had several visitors here, wanting to know about my trip, some getting in shape to do it themselves this summer.

Monday morning up early. River filled with fog - most interesting to see the sun break thru and the mist rise from the river - at 7 A.M. "Breaking Camp" I tried to brush the water off the top of the tent - it wouldn't brush, it was ice!

The last 22 miles of canal has been re-watered, the locks restored and all the buildings rebuilt, so the canal supposedly looks now like it did when it was opened (1831). It's very similar to the English canals we boated on last fall. By now many of the trees are leafing out nicely. The Dogwoods and



"The Canal Clipper" locks through the upper lock of the series of Locks on the C. & O. Canal at Great Falls, Maryland. The mule team, which tows the boat along several miles of the canal is visible at the right.

(Concluded on Page Twelve)

THE MIDDLESEX CANAL: PROTOTYPE FOR AMERICAN CANAL BUILDING

By Thomas C. Proctor

[Editor's note: The following is a summary of a talk that Mr. Proctor presented at the Seventh Annual Canal History and Technology Symposium in Easton, Pa. on March 26. Proceedings of the Symposium will be published by the Canal Museum, P.O. Box 877, Easton, PA 18044.]

In the years between the American Revolution and 1790, some thirty canal companies were incorporated in eight states, with the majority of the construction costs of their canals being raised by public subscription. These early canals were crudely constructed and generally under three miles in length.

One of the first major canals built in the United States was the Middlesex Canal. It was constructed between 1793 and 1803 at a cost of about \$320,000. The canal's twenty-seven mile length spanned the distance from the Merrimack River in Lowell to the Charles River in Boston. The impact of this canal went far beyond its use as a conveyor of goods and passengers. The importance of the Middlesex Canal was that it proved that the exuberant visions of Americans, such as those held by Middlesex Canal President James Sullivan and Chief Engineer Loammi Baldwin, could be made realities.

Professor George Rogers Taylor represents a certain school of historical thought when he states that the Middlesex Canal was a "relatively unimportant waterway." Yet it is clear that the building of the Middlesex Canal trained America's first generation of civil engineers. Additionally, the Middlesex Canal served as a model for American canal builders to emulate. For, in 1816, when a committee of the New York legislature was gathering evidence in support of the technological feasibility of building the 363-mile-long Erie Canal, it sent a delegation to Massachusetts to examine the Middlesex Canal.

In 1795, the Englishman, J. Phillips, remarked of his country, "so great has been the effect which these canals, and the trade to which they have given birth, have had on our industry, population, and resources, that in many instances they have entirely changed the appearance of the counties through which they pass." No less an astounding transformation resulted from the decade-long construction of the Middlesex Canal.

The building of the Middlesex Canal pioneered methods for cutting and transporting massive pieces of stones. This technological experience aided in building Boston with granite and creating the "Boston Style" of granite architecture, which from 1810 on served as an architectural model for the nation. In building the giant piers of the canal's highest aqueduct, Baldwin developed an especially strong Gin Pole for lifting the massive granite blocks up to the height of thirty-five feet above the level of the Shawshen River.

Another major technological innovation in the construction of the canal was the use of hydraulic cement in the stone lock chambers. This use antedated the cement industry in the United States by twenty years. The Directors had heard about hydraulic cement, manufactured from trass, on November 3, 1795. This information convinced them of the utility of this cement, so they sent a sailing sloop to bring back forty tons of trass from St. Eustatius in the Dutch West Indies.

In using this trass, Baldwin learned that careful



Painting by Louis Linscott, showing the Middlesex Canal passing Loammi Baldwin's home in Woburn, Massachusetts. (Courtesy Middlesex Canal Association.)

preliminary grinding of the material saved extensive mixing of the trass with the lime and sand. In fact, it is clear that a year before Smeaton's book, *Narrative of the Edystone Lighthouse* (first edition), was available, in 1798, with information on improved methods for mixing hydraulic cement, Baldwin had already perfected this technology. As he reported to the Directors, "I have made mortar for one of the courses of brick round the Culvert in proportion of 2 bush. 1 Terras, 1 bush. 1 Lime, 3 bush. 1 Sand, which seems to answer the best of any yet tried some like this I made last fall which is now very hard." (May 26, 1797)

Baldwin practiced the art of emulation. He followed the English model in canal construction, whether in hydraulic cement or puddling, and then worked to surpass his model. In puddling to secure the canal's banks against leakage, English engineer Weston advised, "the whole interior part exposed to the action of the water must be covered with a *stratum* of clay about six inches in thickness, and then the same must be well rammed . . . and then another of the same thickness; and so on, until the whole has received coat of [at] least *two feet* in thickness." In practice, Baldwin and the Directors wisely recognized that to follow this prescription would require more time, labor, and materials than they could afford. So Baldwin secured the canal's banks by first ramming the interior walls and then letting the water in and out of the canal "to season the banks." The advantage of this method of puddling, like the Directors' 1799 decision that lock chambers were henceforth to be constructed of wood, was that it served the purpose and also saved money, preventing the Middlesex Canal from sharing the fate of those Pennsylvania companies' canals that ran short of cash and lay unused for twenty-five years.

The Middlesex Canal was a waterway inspired out of the English canal mania and the local desire to engage in projects to promote the Republic. Republican ideology had provided that vision of the public good which enabled the technologically

difficult project, the Middlesex Canal, to be finished. Of course, while any technological system, in this case a canal, "may be sustained by an act of faith," it must, nonetheless "be fashioned by acts of the intelligence" (Elting E. Morison, *From Know-How to Nowhere*, p. 14). Intelligence was gained through the emulation of American and British examples in canal building. And such faith and intelligence, manifested in the construction of the Middlesex Canal, offered the model to which the Erie Canal promoters looked twelve years later.

(From "Towpath Topics", newsletter of the Middlesex Canal Assn. *The Middlesex is one of the New England Canals being toured this month by the American Canal Society.*)

CCS INVITATION TO ACS

To William E. Trout III:

This letter is to extend to you and the members of the American Canal Society a warm invitation to join with the Canadian Canal Society in a program later this year. Based at St. Catharines it would recognize the 160th anniversary of the Welland Canal and the 30th anniversary of the St. Lawrence Seaway.

I understand from our vice-president, John Burtniak, that preliminary discussions have taken place with Lou Cahill, Canadian director of your society and that mutual acceptable dates of September 29, 30 and October 1 have been agreed to following discussions with you and William Shank.

We look forward to the development of our activities of special interest and value to the members of both organizations and thank you for your supportive interest. I understand that Messrs. Burtniak and Cahill are now exploring accommodation arrangements and a schedule of events to be communicated to our members at an early date.

George Hume, President
Canadian Canal Society

CANALS IN THE CRADLE OF CIVILIZATION

By Larry E. Whyte

Archaeologists working in the deserts of southern Iraq recently confirmed the discovery of a 4000-year-old city, the existence of which was originally deduced from traces on satellite photographs taken in May 1987. The ancient city, which was named Mashkan-shapir, was first settled in 2050 B.C. and later developed into an important trade center because it was located between the Tigris and Euphrates Rivers.

According to an article appearing in *Science News* (Vol. 135, No. 13, April 1, 1989) a team of researchers led by Elizabeth Stone of the State University of New York, and Paul Zimansky of Boston University, has identified the ancient city which was dedicated to Nergal, the Babylonian god of death, from a number of clay cylinders found embedded in the remains of the city walls bearing Sumerian cuneiform writing. From these fragments, and a large number of artifacts collected on the site, scientists have been able to piece together the city's history, which interestingly enough, seems to indicate the existence of an ancient canal in this Mesopotamian metropolis. Archaeologists confirm that the city wall itself was constructed in 1843 B.C. by King Sin-iddinam of Larsa, to protect the center of trade. By this date, Mashkan-shapir had already become an important city due mainly to the construction of a canal which joined the Tigris and Euphrates. The canal was built around 2000 B.C., and facilitated waterborne trade between these two ancient rivers in the very cradle of civilization. Apparently the channel was excavated under the rule of a previous king of Larsa, as Sin-iddinam ruled only from 1849-1843 B.C. According to the article, the canal passed just north of the city wall of Mashkan-shapir. No other details of the canal itself were revealed, if they are indeed known. It would be interesting to note the topography in this region and the possible routes for such a canal to postulate whether lift locks would have been necessary on this navigation. Do we have any canal historians out there who can decipher cuneiform?

TRIALS AND TRIBULATIONS

By Bill McKelvey

The following case was reported in the proceedings of the October 1810 Term of the Massachusetts Supreme Court, titled: "Issac Riddle versus The Proprietors of the Locks and Canals on the Merrimack River."

"The plaintiff, on the said tenth of November 1809 at said *Chelmsford*, was possessed of a certain raft, not exceeding twenty-five feet in width, and one hundred feet in length, lying near the head of said canal, and with which he was then and there desirous to pass through and for the passage of which he then and there paid the toll, by law due and payable to the said proprietors. And the plaintiff avers that the other parts of the river were, on the said tenth day of November last, passable for the same raft, viz. at said *Chelmsford*; yet the said proprietors, in no wise ignorant of the premises, but unmindful of their duty in this behalf, on the said tenth day of November, and for a long time before, did omit to open, and dig the same canal of a depth sufficient for boats, rafts, masts,

"NARROW BOATS" ON THE ERIE CANAL?



The "Owasco", one of a fleet of Lockmaster canal boats, designed and built by Mid-Lakes Navigation of Skaneateles, New York. The boats are available for hire on the New York State Canals, and are similar in appearance and design to the famous English "Narrowboats".

CANALS OF CANADA — Robert F. Leggett (1976). While this 261-page hard-bound book is not a new one, the publishers have decided to offer their remaining copies at a much reduced price. It is a fine book, as are all of Robert Leggett's works. It contains excellent maps and illustrations of Canada's canals and waterways, historical and current, including the St. Lawrence Seaway, the Maritime canals, the "Soo", the Trent, the Rideau, the Shubenacadie, the Chambly, the Ottawa River Canals, the St. Peter's, the Cansco, the Lachine, and many more. It is truly a guide book to all the Canadian canals and a bargain at the new price: \$4.99 plus \$1.00 for shipping. Write the publishers: Douglas and McIntyre, 1615 Venables St. Vancouver B.C. V5L 2H1, Canada.

Arthur W. Smith of Cannonsburg, Pa. and Roger A Weaver of Mars, Pa. have just become LIFE MEMBERS of the American Canal Society. Membership in this important group now stands at sixty-eight.

COMING EVENTS IN VIRGINIA:

June 9-11, River Festival, Lynchburg, VA Batteau Rides.

June 17th-25th, James River Batteau Festival, Lynchburg to (almost) Richmond. Info from Joe Ayers, P.O. Box 790, Columbia, VA 23038.

September 16th (tentative), James River Canal Opening Bicentennial celebration, Great Ship Lock Park, Richmond, VA.

Old Man-Old Bike-Old Canal

(Concluded from Page 10)

redbud are a superb color combination. I was amazed to keep the feeling of being in isolated country almost down to the last mile, where the canal enters Georgetown. Many more visitor facilities here, as the Great Falls area draws all types of outdoor activists.

Biking down the last few miles I was mulling over the options of returning to Point of Rocks and my truck - my "way home". Met a fellow walking his goat along the path and after some discussions with him, decided to try & hitch a ride with my bike, lots of pick-up trucks out there he suggested.

Not wanting to "hitch" in downtown D.C. I decided to return to the "suburbs" via the towpath - out five miles out I met a fisherman (with 2 - 5 gal. pails of fish!) who offered me a lift out past Gaithersburg. He left me at an obscure junction of Interstate 270, south of Frederick - not much traffic here and (unlike near the canal) people don't seem to be able to relate to what I'm doing. It's now 1:30 P.M. and a beautiful day so I decide to bike back to the truck, another 18 miles - so I ended up at 4 P.M. on day 5, with a total of 207 miles. All in all, a splendid trip.

P.S. - I forgot to tell you about my bicycle - it's a 1948 Schwinn - one speed - has a large, large wire basket on front - bought the basket & frame from a dealer's junk pile for \$5, plus two wheels for \$1 each - last fall I rebuilt the whole mess - new tires & tubes and chain - made several adjustments this spring while "conditioning", but had not a problem with the bike on the entire trip.

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