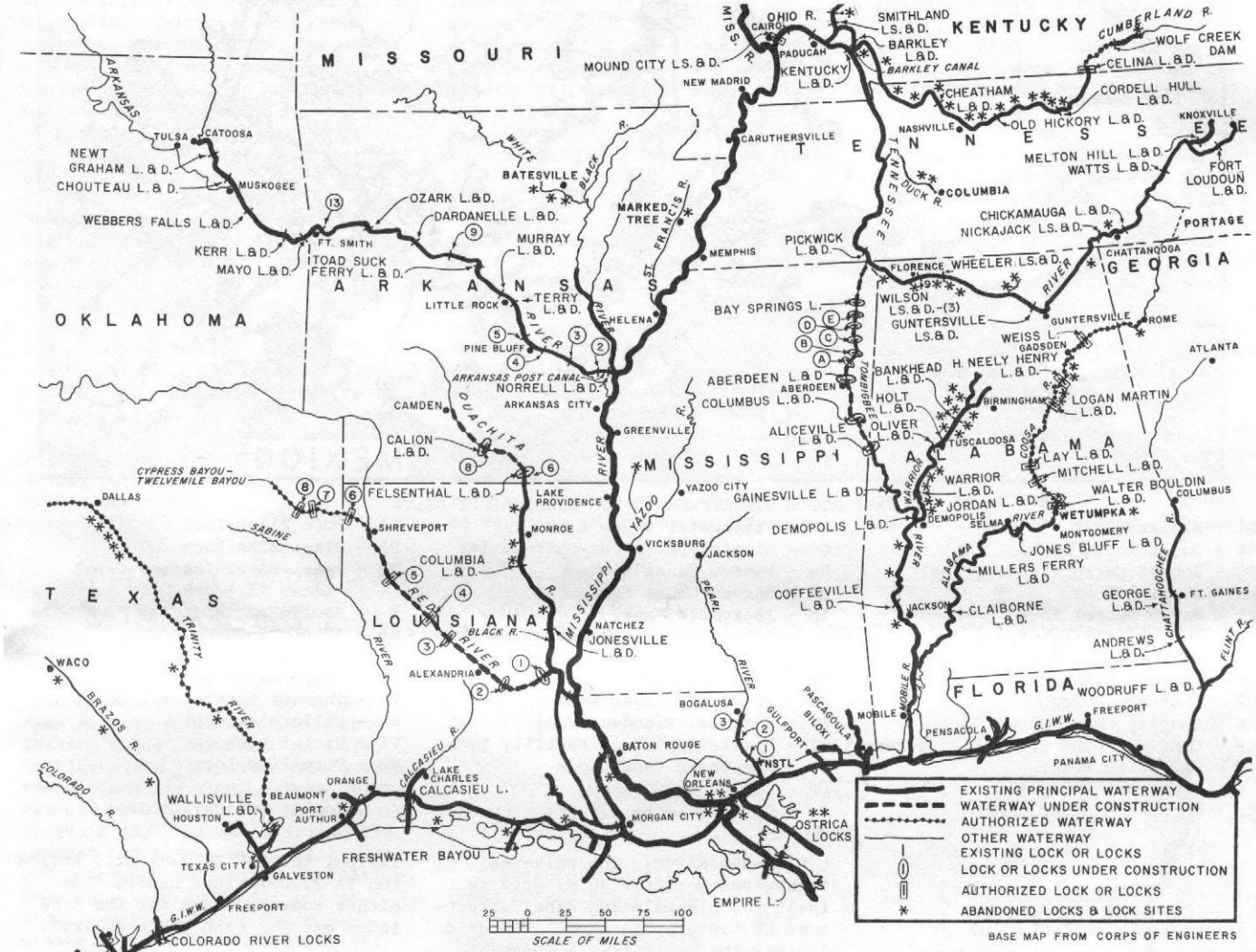
THE AMERICAN CANAL GUIDE

A Practical Guide to the Historic Canals of the United States and Canada
Published by the American Canal Society, 809 Rathton Rd. York, Pa. 17403
Part 3 The Lower Mississippi & Gulf States July 1979



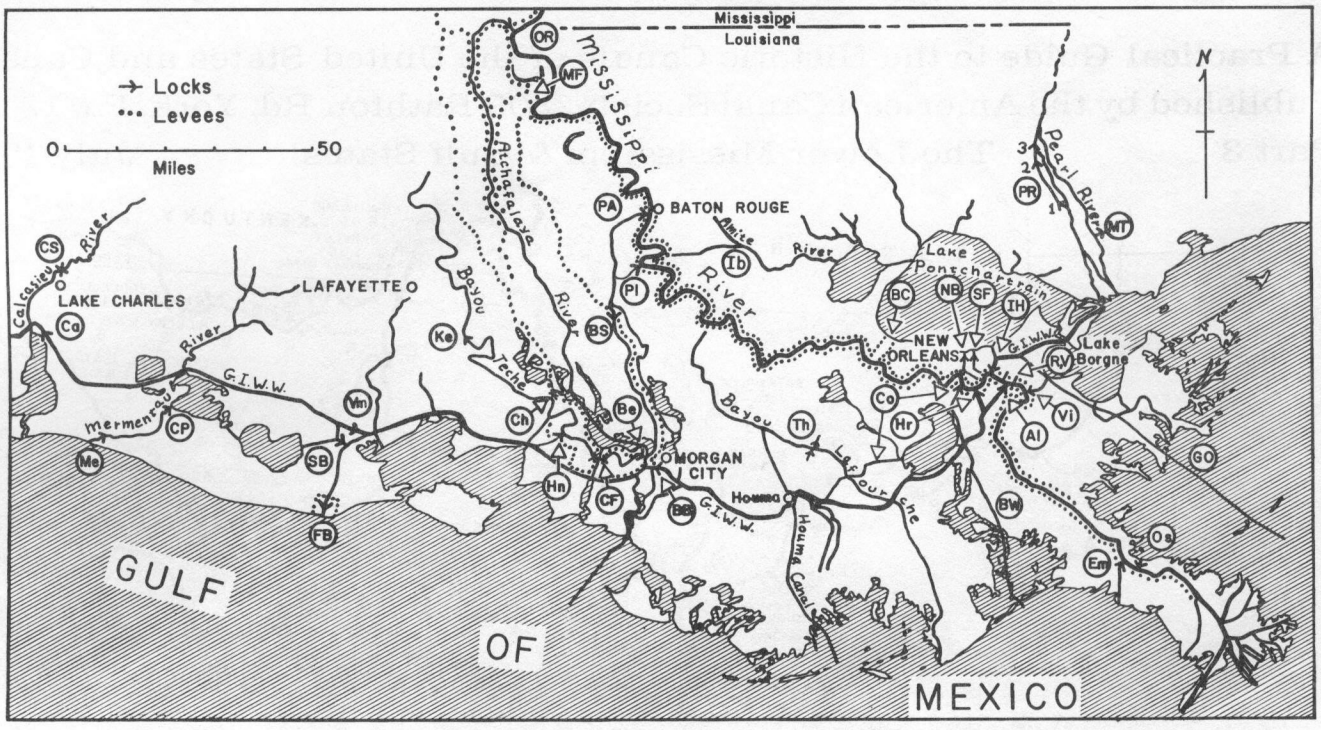
This is the third in the AMERICAN CANAL GUIDE series, published as a Bicentennial contribution by the American Canal Society to provide a basic inventory of America's historic canal resources for their future study, preservation, and use in the creation of parks, trails and open space. The Lower Mississippi and Gulf region was steamboat country, and much has been written about them; but this is the first systematic search for all of the old locks and navigable canals, to discover where they were and what has happened to them, and to make recommendations for their future.

In addition to the 66 locks now in operation (which will in time be historic structures themselves) and the 13 under construction, we have so far found over 90 abandoned locks or lock sites in this region, many of them already Corps of Engineers parks. A number of others are prime park sites and are emphasized in the text. There must be more locks, especially privately built ones, yet to be rediscovered.

We are particularly indebted to the Corps for their help and for their publication of Bicentennial District Histories, which are invaluable contributions to American engineering history. These are noted in the text as sources of further information. Many thanks also to the other agencies and individuals who provided information, and to Adrienne Fryhoff, who typed the manuscript.

Readers are urged to join the society and subscribe to AMERICAN CANALS ($8 a year to the Secretary, Charles W. Derr, Jr., 117 Main St., Freemansburg PA 18017) and to please send additions and corrections to the guide Editor, William E. Trout, III, 1932 Cinco Robles Drive, Duarte CA 91010, (213) 358-4802. Copies of Part 3 are available from this address at $3 ppd.; Part 1 (The West Coast) at 50¢, and Part 2 (North Carolina to Florida) at $1.

PUBLICATION OF THIS GUIDE HAS BEEN MADE POSSIBLE BY A GRANT FROM REYNOLDS METALS COMPANY



NAVIGATION STRUCTURES IN THE MISSISSIPPI DELTA

Al - Algiers Lock
BB - Bayou Boeuf Lock
BC - Bonnet Carre Floodway (nn)
Be - Berwick Lock
BS - Bayou Sorrel Lock
BW - Barataria Waterway
Ca - Calcasieu Lock
CF - Calumet Floodgates
Ch - Charenton Floodgate
Co - Company Canal Lock
CP - Catfish Point Control Structure
CS - Calcasieu River Salt-Water Barrier
Em - Empire (Doullet) Lock
FB - Freshwater Bayou Lock
GO - Mississippi River-Gulf Outlet
Hn - Hanson Canal Lock
Hr - Harvey Canal Lock
Ib - Iberville Canal
IH - Inner Harbor Navigation Canal (Industrial Canal) Lock
Ke - Keystone Lock
Me - Mermentau River Lock
MF - Morganza Floodway (nn)
MT - Mississippi Test Facility Lock
NB - New Basin Canal Lock
OR - Old River Lock
Os - Ostrica Locks (3)
PA - Port Allen Lock
Pl - Plaquemine Lock
PR - Pearl River Lateral Canal Locks (3)
R - Rodriguez Canal
SB - Schooner Bayou Lock
SF - Spanish Fort Lock and Carondelet Canal Basin
Th - Theriot Canal Flash Locks
V - Villere's Canal
Vi - Violet Lock
Vm - Vermilion Lock

(nn) = not navigable

GENERAL INFORMATION

TWO-LETTER STATE ABBREVIATIONS:

AL	ALABAMA	MS	MISSISSIPPI
AR	ARKANSAS	OK	OKLAHOMA
GA	GEORGIA	TN	TENNESSEE
KY	KENTUCKY	TX	TEXAS
LA	LOUISIANA		

U.S. ARMY ENGINEER DISTRICTS IN THE LOWER MISSISSIPPI & GULF STATES:

P.O. Box 17300, FORT WORTH TX 76102
P.O. Box 1229, GALVESTON TX 77550
P.O. Box 867, LITTLE ROCK AR 72203
586 Clifford Davis Boulevard, MEMPHIS TN 38103
P.O. Box 2288, MOBILE AL 36628
P.O. Box 1070, NASHVILLE TN 37202
P.O. Box 60267, NEW ORLEANS LA 70160
P.O. Box 61, TULSA OK 74101
P.O. Box 60, VICKSBURG MS 39180

UTM CO-ORDINATES: The Universal Transverse Mercator (UTM) grid is ideal for pin-pointing canal structures on topographic maps. The grid divides the world into 60 north-south zones 6° wide. Within each zone the location of a structure is defined by its distance in kilometers across the zone (E) and from the equator (N). These distances are shown by blue ticks a kilometer apart on most U.S. Geological Survey topographic maps. A structure in zone 10, 548.55 km across the zone (E) and 5277.43 km from the equator (N) would be at UTM 10. 54855.527743. UTM's are noted in the text, for all old locks on topographic maps with UTM co-ordinates.

U.S.G.S. TOPOGRAPHIC MAPS are available at $1.25 each from the Distribution Section, U.S. Geological Survey. Orders for quadrangles west of the Mississippi should be sent to the Survey at Federal Center, Denver, Colorado 80225; east of the Mississippi to 1200 E. Eads St., Arlington VA 22202; mixed orders from either address. Ask for the free index map for each state desired.

An illustrated WATER RESOURCES DEVELOPMENT report is available for each state, free from any pertinent Corps District, as well as regional LAKESIDE RECREATION map pamphlets. Part 3 is covered by the Southeast and Southwest region pamphlets.

Prices given for Corps of Engineers publications are postpaid, payable to "Treasurer of the U.S."

Some Corps of Engineers locks, although operating 24 hours a day, are now officially open to visitors only from 9 to 4. The lock personnel are always helpful and obliging and sometimes at the more isolated locks are positively glad to have a visitor.

In the descriptions given in this guide, left and right river banks are those while facing downstream.

Railway museum information in this guide is from Randolph Kean's

1973 RAILFAN'S GUIDE, now out-of-print. The reader is cautioned that this information and all other opening hours, schedules, prices, and availability of publications is subject to change.

Anyone interested in American river navigation history should know about the S&D REFLECTOR, the excellent illustrated magazine published by the Sons and Daughters of Pioneer Rivermen ($10 per year to Mrs. J.W. Rutter, Secretary, 964 Worthington, Birmingham Michigan 48009); and the impressive STEAMBOAT BILL published by the Steamship Historical Society of America (Jim Wilson, 414 Pelton Ave., Staten Island NY 10310). To keep up with current river news a must is the WATERWAYS JOURNAL ($12.50 a year from Waterways Journal, 666 Security Bldg., 319 N. 4th St., St. Louis MO 63102). For Corps water projects see WATER SPECTRUM, their quarterly available at $6.20 a year from the Government Printing Office, Washington DC 20402, payable to "Superintendent of Documents."

THE LOWER MISSISSIPPI

THE LOWER MISSISSIPPI RIVER - the 954 miles below the mouth of the Ohio at Cairo - has no locks and dams and has meandered incredibly, leaving oxbow lakes and cut-offs, mocking state lines and even erasing towns along its route. Some of the cut-off canals, such as Capt. Henry Shreve's 1831 cut which formed the present Old River, were deliberate and man-made, to improve navigation. Some cuts were evidently not so public spirited: Mark Twain explains in LIFE ON THE MISSISSIPPI, Ch.17, how during high water, armed guards were sometimes stationed at horseshoe bends to prevent a landowner from shifting the course of the river to his own plantation, leaving his neighbor bereft of river transportation. Twain also calculated that since the lower Mississippi shortened itself though natural and man-made cut-offs a distance of 242 miles in 176 years, it is clear that by the year 2625 the river will only be 1-3/4 miles long!

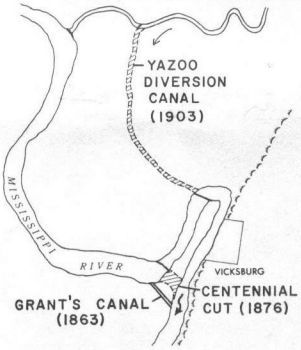
The cut-off canals are of course now the main channel of the Mississippi (from the Indian MECHE SEBE, "Great River"); dozens are shown with names and dates in FLOOD CONTROL AND NAVIGATION MAPS OF THE LOWER MISSISSIPPI RIVER by the Mississippi River Commission, available at $10 from the Vicksburg District. Especially recommended to accompany this is HISTORIC NAMES AND PLACES ON THE LOWER MISSISSIPPI (1977) by Marion Bragg for the Mississippi River Commission, $3.50 from the Vicksburg District. Of a more technical nature is IMPROVEMENT OF THE LOWER MISSISSIPPI RIVER AND TRIBUTARIES 1931-1972 (1972) by Norman Moore, at $12.50. This supplements the out-of-print HISTORY OF THE IMPROVEMENT OF THE LOWER MISSISSIPPI RIVER FOR FLOOD CONTROL AND NAVIGATION 1932-1939 (1940) by H.B. Ferguson, which is full of maps showing the fantastic meanders of the river during the last two centuries.

Also of special importance are the Bicentennial histories of the three districts which cover the lower Mississippi. A CENTURY ON THE MISSISSIPPI (1976) by Dr. Floyd M. Clay is available at $10 from the Memphis District; OF MEN AND RIVERS (1978) by Dr. Gary B. Mills is $6 from the Vicksburg District; and THE DELTA ENGINEERS (1971) by Dr. Albert E. Cowdrey is $1.60 from the New Orleans District. The last is a condensation of a larger history now out of print, which should be republished in the near future.

Anyone driving along the river on "The Great River Road" should also have Warren E. Brant's A LOG TO THE LOWER MISSISSIPPI (1976), $3.35 ppd. from American Motor Logs, 2099 LaCrosse Ave., St. Paul MN 55119. Also available at the same price are logs to the Upper Mississippi, and the Ohio. For boaters, QUIMBY'S HARBOR GUIDE to the Mississippi area is available from Mildred Quimby, Box 85, Prairie du Chien WI 53821.

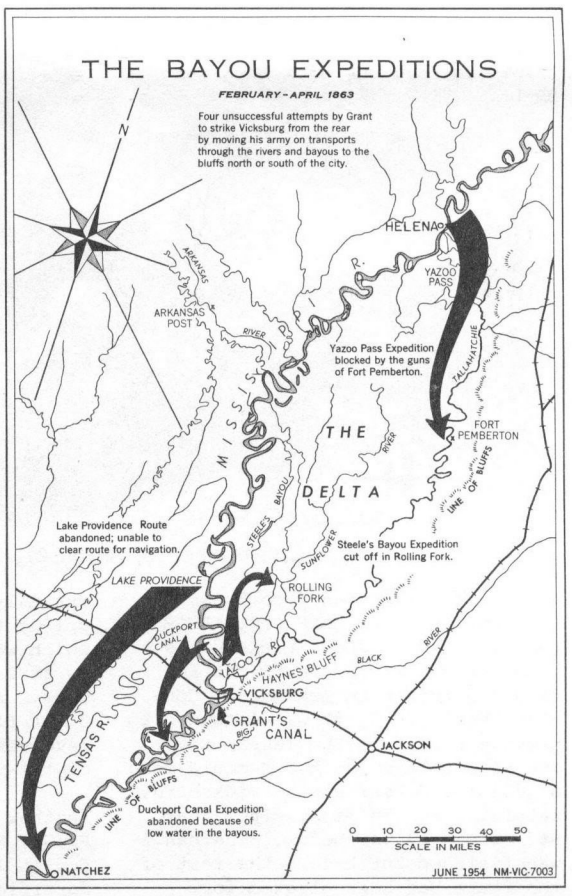
During the War of Northern Aggression, Grant's army made a number of attempts to bypass or outflank the guns at Vicksburg, "The Gibraltar of the Confederacy," which had succeeded in bottling up all river traffic. Some of these attempts involved canals, to cut across river bends or give access to the swampy bayous and streams on both sides of the Mississippi. Most were unsuccessful but kept the army busy.

The most famous of these was GRANT'S CANAL, an attempt to make a cut-off across De Soto Peninsula opposite Vicksburg, a bend 10 miles around but only 1¼ miles across. This was



Vicksburg's Canals
(from OF MEN AND RIVERS)

"Cutting the Canal Opposite Vicksburg"
(HARPER'S WEEKLY, August 2, 1862)



Grant's Attempts to Bypass Vicksburg by Water
(Modified from VICKSBURG, NPS 1954)

one of Lincoln's favorite projects, which would have allowed the Union gunboats and shipping to bypass Vicksburg, out of range of the guns. The canal was first attempted in 1862 by Gen. Thomas Williams and 1200 slaves who managed to dig a ditch 18' wide and 13' deep, but the river level kept going down and never entered the cut to scour out a proper channel. Six months later Grant took it up again, re-excavating the canal, but this time high water impeded the work by breaking through the coffer dams, and Confederate gunfire drove off the dredges.

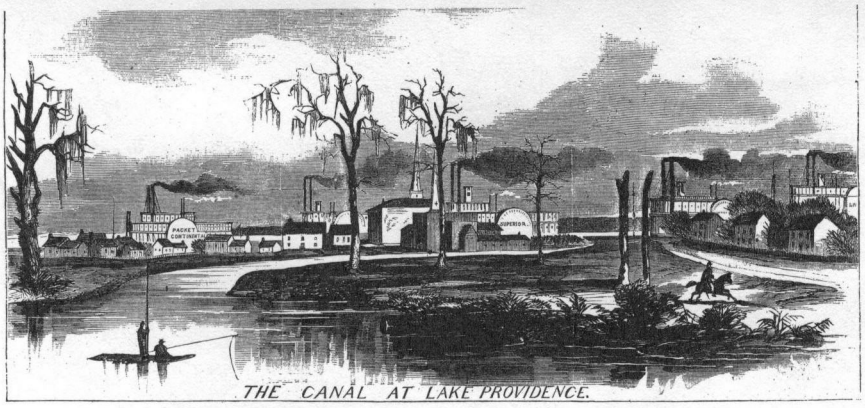
Ironically, D.F. Bastian, in "Hydraulic Analysis of Grant's Canal" (THE MILITARY ENGINEER, July-August 1974), has calculated that if Grant had only removed the coffer dam at the lower end of the canal, the river would probably have scoured it out successfully. It is curious that only 13 years later in 1876 the river made its own cut through the peninsula a mile east of the canal. Known as the CENTENNIAL CUT, it put Vicksburg on a backwater now supplied by the Yazoo River through the YAZOO DIVERSION CANAL (1903). Some evidence of Grant's Canal still remains; it is crossed by US 80, 1½ miles W of the Mississippi crossing. UTM: 15.694520.3577700, Vicksburg West MS-LA.

marker on US 80 in Lake Providence (Lake Providence LA-MS quad.).

The DUCKPORT CANAL was also designed to reach the Tensas River, to provide a shorter bypass around Vicksburg from mile 445.7 to a point about 20 miles below the city. It was actually completed, in 1863, and several boats navigated the entire route but the river began to fall leaving others stranded before the route was abandoned.

Another cut was through the YAZOO PASS LEVEE, 220 miles above Vicksburg at mile 658.0 opposite Helena, Arkansas. This 1863 attempt to take the Vicksburg defenses from the rear via the Coldwater, Tallahatchee and Yazoo rivers was eventually driven back by the Confederates. MS 1 crosses the pass at the site of Grant's cut, now on the National Register of Historic Places. UTM: 15.730500.3813470, Lula MS.

There were at least two other military canals across Mississippi River bends. The NAPOLEON CUT-OFF was more successful than Grant's Canal, cutting through a narrow peninsula near the mouth of the Arkansas River at what is now mile 584.5. Completed in 1863, the military objective of eliminating sniping from the neck was accomplished, but unfortunately the cut aimed the Mississippi at the town of Napoleon, Arkansas, which was gradually washed away and by 1882 was no longer shown on river maps. Mark Twain's story in Chapter 31 of LIFE ON THE MISSISSIPPI revolves around the unexpected fate of the town of Napoleon.



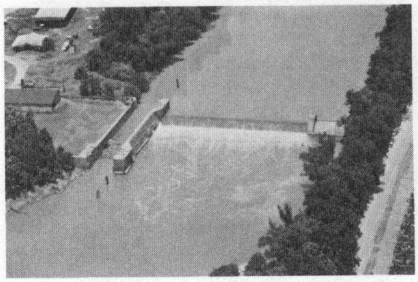
THE CANAL AT LAKE PROVIDENCE.

(HARPER'S WEEKLY, March 21, 1868)

Another canal designed to bypass Vicksburg was the LAKE PROVIDENCE CANAL, 50 miles above Vicksburg at mile 487.3, between the river and Lake Providence in Arkansas. Constructed in 1863, it was intended to provide access to the Tensas River and Baxter Bayou so boats could make a 140-mile detour around Vicksburg, returning to the Mississippi near St. Joseph LA, or below. The canal was finished but before the rest of the route had been cleared for navigation, the project was abandoned. The last remnants of the canal were covered by the Mississippi River Levee in 1953 but there is a

Another cut-off, across DONALDSON POINT, Missouri, at mile 904.5 was dug in 1862 to bypass Confederate fortifications on Island No. 10, but it was too shallow and narrow for navigation, and was completely blocked off when the Confederates scuttled one of their own steamers across the lower end.

It is not clear which, if any, of these canals was the "secret canal" mentioned by Harnett Kane in SPIES FOR THE BLUE AND GRAY. When a Yankee spy showed his superior a newspaper article describing the secret canal plans in detail, the project was dropped!



Big Sunflower Lock and Dam
(Vicksburg District, C of E)

The only lock in the Vicksburg area is BIG SUNFLOWER LOCK & DAM (26x160', 16.9' lift), constructed in 1918 at Little Callao Landing on the Big Sunflower River, 62 miles upstream from its mouth on the Yazoo and about 100 miles above Vicksburg. It was abandoned in 1937, by which time the 4½ foot channel depth was only useful to loggers. The lock is of concrete and still serves with the dam as a weir; one end is sealed, and the timber miter gates are gone. It can be reached by going a mile south from the MS 12 bridge over the Big Sunflower, 11 mi. W of Belzoni MS. UTM: 15.71600.367272, Midnight NW MS quad. A lock and dam has been authorized on the Yazoo near Vicksburg to provide navigation up to Greenwood, but it has not been funded.

The defenses of Vicksburg are now in Vicksburg National Military Park (National Park Service, Union Avenue, Vicksburg MS 39180). The visitor center (8-5 daily, 8-6 in summer) has exhibits of the gunboat CAIRO, sunk by a torpedo in 1862 and raised in 1960-63. The experience of raising and preserving the CAIRO will help future sunken canalboat projects. The National Park Service booklets VICKSBURG (# 0-487-145, 75¢) and U.S.S. CAIRO (# 0-422-838, 70¢) are available from the Government Printing Office.

The museum in the paddlewheeler SPRAGUE - "Big Mama," which once towed the equivalent of 1500 railway cars of coal - is, alas, no more after the fire in 1974, but great efforts have been made to save her and the way now seems clear toward restoration by the Mississippi Park Commission. Contact the Save Our SPRAGUE Committee, Box

1098, Vicksburg MS 39180. For a history of the SPRAGUE see the Memphis District history.

The WATERWAYS EXPERIMENT STATION of the Corps of Engineers, with 70 hydraulic models of the Niagara River, etc., is 5 mi. S of Vicksburg on Halls Ferry Road, open M-F 8:30-3:00, guided tours at 10 and 2. The 50-acre MISSISSIPPI BASIN MODEL is not here but in Jackson, 35 mi. E off I-20, open M-F 10 to 2.

Also of interest along this part of the river is the steamboat exhibit in the Natchez Museum (111 S. Pearl St., 10-5 M-Sat.) and a river museum in preparation in downtown Memphis' Volunteer Bicentennial Park on Mud Island, which will include a scale model of the river, and lock and dam models.

LOUISIANA

The Mississippi River drains about 41% of the land area of the continental U.S. - the third largest drainage basin in the world, and all this flows into the Gulf of Mexico through the Mississippi Delta, where over the centuries the river's silt has been deposited. The river has meandered back and forth across the delta, leaving old mouths and stretches of channel known locally as bayous (pronounced BI-oos or BI-as), which were the roadways of the inhabitants, carrying everything from steamboats to poled pirogues. This low-lying region has in time become a complex network of canals, even so-called "secret canals" used during prohibition.

To keep the Mississippi out of these lowlands, many miles of levees (going back to 1717 at New Orleans) have been constructed along it, with the Atchafalaya River, one of the old Mississippi mouths, acting as a safety valve or "floodway" lined with its own levees. Most of the locks in the delta either permit navigation through the Mississippi or Atchafalaya levees, or protect from salt-water intrusion the Mermentau River basin, where one quarter of the U.S. rice is grown. All but two of the operating locks belong to the Corps of Engineers; Empire and Ostrica locks are state-owned.

Although the oldest lock still in operation (Keystone) only goes back to 1913, there are many abandoned ones from the nineteenth century. We hope that this guide will encourage a thorough study of these early locks and canals, and the rediscovery of more of them.

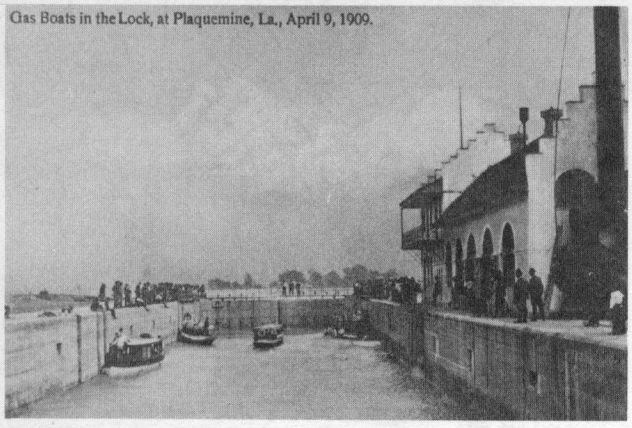
OLD RIVER LOCK is on LA 15, opposite the LA-MS state line, 304 miles above the mouth of the Mississippi (river mile 304). Constructed in 1963 with a chamber 75x1200' and up to 37' lift (depending on the river stage), this lock has the mind-boggling function of preventing the Mississippi from changing its course back into the Atchafalaya River. Calculations by the Corps of Engineers had indicated that if the "Old River" (part of a meander loop cut off by Capt. Henry Shreve in 1831) were left uncontrolled, the Mississippi would shift through it to the Atchafalaya sometime between 1965 and 1975, leaving the old Mississippi a brackish estuary at Baton Rouge and New Orleans. Now the lock forms part of the levee system controlling the Mississippi, and a spillway in a separate cut at mile 315 acts as a relief valve, shunting extraordinary floodwaters into the Atchafalaya basin to protect New Orleans. Two other spillways are the Morganza Floodway at mile 285, 4 miles long, and the Bonnet Carre Floodway at mile 128, just above New Orleans, which shunts floodwaters when necessary into Lake Pontchartrain.

The PORT ALLEN LOCK (mile 228.5, 84x1198', up to 45' lift, 1961) opposite Baton Rouge, is the upper entrance to the Morgan City - Port Allen branch of the Gulf Intracoastal Waterway (GIWW). Follow the signs "To Port" at the I-10/LA 1 interchange. This is a huge concrete structure with miter gates, and enormous steel stop planks stored at the upper end.

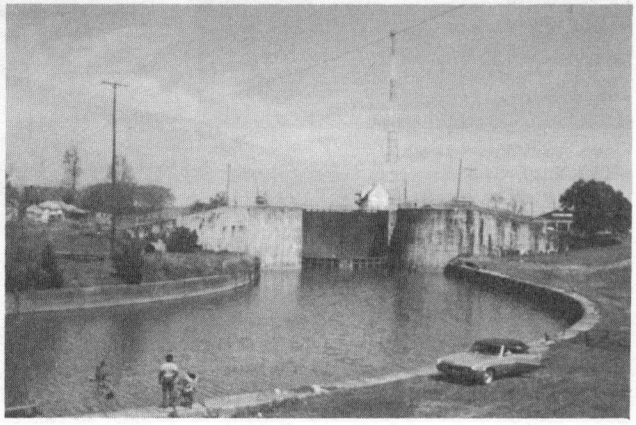
PLAQUEMINE (pronounced PLAK-men) LOCK (mile 209, 55x260', 0-55' lift, 1909) is the most picturesque concrete lock in the country. Watch for it to the east in Plaquemine after the LA 1 bridge over the Bayou Plaquemine (Indian for persimmon), made famous in Longfellow's poem "Evangeline": In the mid-1700's, Evangeline and other Acadian exiles from Nova Scotia floated down the Mississippi, then "swerved from their course; and entering the Bayou of Plaquemine, soon were lost in a maze of sluggish and devious waters...."

The lock is now the starting point of the annual re-enactment of the voyage during the International Acadian Festival on the last weekend in October every year. The 111-mile route (passing near Bayou Sorrel Lock, over the Charenton Floodgate, and through Keystone Lock) to St. Martinville and the Evangeline Memorial State Park (museum open M-Sat 8:30-4:30, Sun 12:30-4:30) is well described in CANOEING IN LOUISIANA, available at $2.20 ppd. from the Lafayette Natural History Museum, 637 Girard Park Drive, Lafayette LA 70501.

The bayou was a natural connection between the Mississippi and the Atchafalaya River basin until 1867, when the local parish constructed a levee across it. The lock restored this connection, and was designed by Col. George W. Goethals of the Corps of Engineers, later Chief Engineer for the Panama Canal. At the time, it had the highest fresh-water lift of any lock in the world. However, the picturesque curve in the bayou (making two



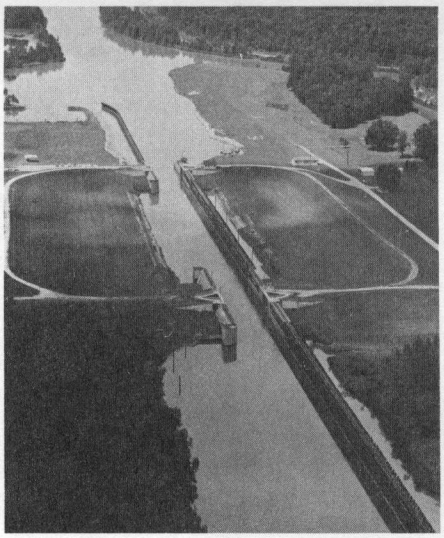
Plaquemine Lock still has its lockhouse, as in this 1909 postcard view. (Don Ramsey)



Plaquemine Lock from the Winding Bayou in 1975

right angle bends) was too much for modern barge traffic so in 1961 the lock was replaced by the Port Allen Lock ten miles upriver, and the lock became a park maintained by the Corps. Fortunately, the plans of the LA Dept. of Highways to put a highway across the lock or across the curves of the bayou, have so far been successfully fought by Gary W. Hebert, Editor of the GREATER PLAQUEMINE POST, who put the lock on the National Register.

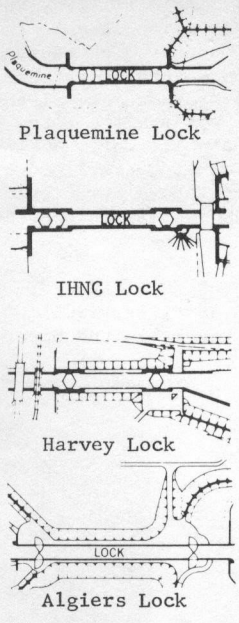
When the lock was abandoned the Mississippi levee was continued across the upper end, but the bayou side is still as picturesque as ever, complete with a lockhouse. There are two pairs of miter gates at each end of the lock, double the usual number, for protection from the Mississippi, and there is also a short pair of gates at the lower end, facing the bayou, for times when the river was lower than the bayou, called "reverse head." The levee now covers the upper two pairs of gates but the rest are intact and one can cross the lock on one pair. Plaquemine Lock and the bayou deserve continued protection and are well worth a visit. UTM: 15.669800.3352320, Plaquemine LA. There is a museum in Plaquemine on Martin St. behind the library, open M-Sat 8-5, M&W evenings to 8.



The Turf-Sided Bayou Sorrel Lock (New Orleans District, 1972)

The BAYOU SORREL LOCK is on the Morgan City - Port Allen branch of the GIWW not far from Plaquemine Lock, and faces in the opposite direction, taking the branch through a levee into the Atchafalaya River floodway. From Plaquemine take LA 3066 (Bayou Road) along the S bank of Bayou Plaquemine to "Indian Village," then S along LA 75 to Bayou Sorrel. Turn R at the bridge then L for a mile to the lock (56x 800', 0-21' lift, 1951). Curiously enough, this modern lock is like an ancient turf-sided or earth-chambered lock, with a pair of concrete gate bays at each end of a large square grassed basin; barges are held in the chamber proper by wooden guide-walls. The gates are pie-slice shaped sector gates, facing south to protect the Plaquemine area from floods of the Atchafalaya River. Unlike miter gates, the sector gates can be opened against a head of water, so the lock is filled and emptied in this manner, without any sluices or wickets.

The IBERVILLE CANAL was actually a river and lake navigation, from the Mississippi just above Plaquemine, through the Iberville and Amite rivers and Lake Maurepas to Lake Pontchartrain. It was a military canal, built by the British under General Gage, intended to bypass the Mississippi past New Orleans, which was then held by the French. A schooner made the first transit on July 28, 1768, but that may have been the last, and no traces probably remain today. For more details see ACS Canal Index Sheet LA-1 on the Iberville Canal, by L.W. Richardson, and D.S. Brown's article in the March, 1946 MISSISSIPPI VALLEY HISTORICAL REVIEW.

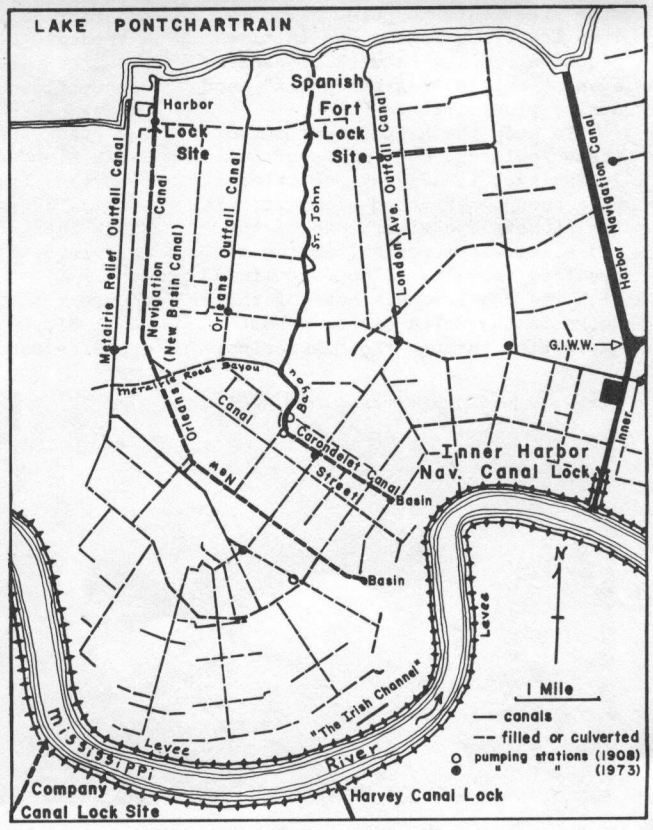


Mississippi Levee Locks, Showing Gate Arrangements (Lower Mississippi map book, C of E)

NEW ORLEANS

The City of New Orleans was once laced with drainage and navigation canals, but most have been covered over, leaving a great underground network which would make a fascinating engineering study. A 1908 map shows more than 50 miles of open canals, and a recent one twice as many. Until the Inner Harbor Navigation Canal was completed in 1923, with a protective lock in the levee, none of the canals connected with the Mississippi River because New Orleans is like a dish, below high water in the river and the lake so no break could be allowed in the levee. In fact, the frequent drop from river to city canal level was used very early to power a sawmill seen in prints of the old city (now called the French Quarter), bounded by Canal, Rampart and Esplanade Streets. This "Saw Mill Canal of Peter de Marigny" is now occupied by Elysian Fields and Florida Avenues, from the river end of Esplanade Street to Bayou St. John.

CANAL STREET itself was evidently never navigable, but was a ditch or moat between the old city and the Creoles. At some time it was planked over, and now is one of the



Drainage and Navigation Canals in New Orleans

widest and most famous streets in the world.

Four of the canals are still visible - Metairie Relief Outfall, Orleans Avenue Outfall, Bayou St. John, and London Avenue Outfall (probably the Orleans Bank Canal mentioned by Tanner) but the others are now the city's widest streets - Pontchartrain Boulevard, Gentilly Boulevard, Jefferson Davis Parkway, Claiborne Avenue, Metairie Road, Interstate 10, Broad Avenue, Bernard Avenue, etc. The IRISH CHANNEL, in the vicinity of St. Thomas St. (opposite the Harvey Canal) was not a canal at all but an area settled by Irish immigrants in the 1840's who, in this part of the country as elsewhere, provided cheap labor for canal digging and as usual were ravaged by yellow fever and cholera.

Scattered about the city are pumping engines ("Draining Machines") to pump water up into Lake Pontchartrain. By 1884 there were four pumping stations (shown on a 1908 map) each with a steam-driven paddle wheel, but there were still problems now and then such as when the Mardi Gras parade had to take place in a foot of water, and when the opera had to be cancelled because the stage was under water. These problems were solved in the 1900's with the installation of high-volume screw pumps invented by the New Orleans engineer H.B. Wood. The 1915 pump in Pumping Station #1 at Melpomene and Broad Streets has been designated a National Historic Mechanical Engineering Landmark by the American Society of Mechanical Engineers.

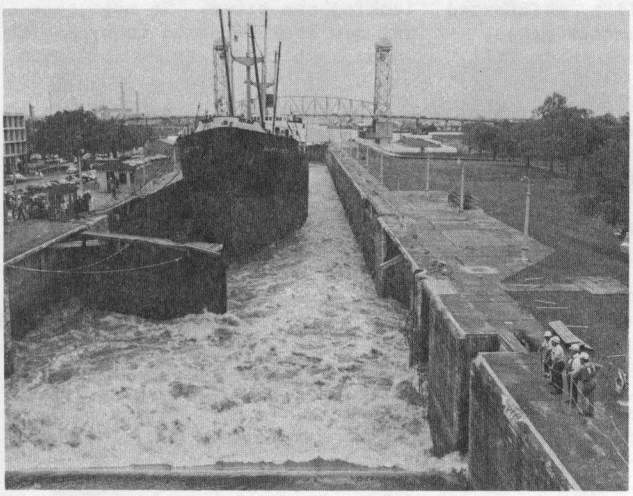
BAYOU ST. JOHN, which bisects the north half of New Orleans, was a determining factor in the location of the city, and even had a fort - now called "Spanish Fort" near its mouth on Lake Pontchartrain. Extending southward five miles to within two miles of the Mississippi, it had been part of the Indian trading route between the lake and the river and must have been appreciated by the city's founder, Sieur de Bienville, the same Frenchman who first envisioned the Tennessee-Tombigbee Waterway. In 1794 Governor Carondelet built at great expense a navigable extension of the bayou, called the CARONDELET (or OLD BASIN) CANAL (not to be confused with the Carondalet Canal in Canada). This brought boats to the old city, within half a mile of the river, but did not connect with it. In 1927 the canal was filled in and is now Lafitte Street; the terminal basin was near the municipal auditorium. UTM: 15.78280.331780, New Orleans East LA.

For a time SPANISH FORT LOCK (40x490') was operating on the bayou just S of the Robert E. Lee Boulevard crossing, but sadly, it was removed in 1969-72 and replaced by a landscaped waterfall across the street near the ruins of the fort. UTM: 15.781300.3324350, Spanish Fort LA.

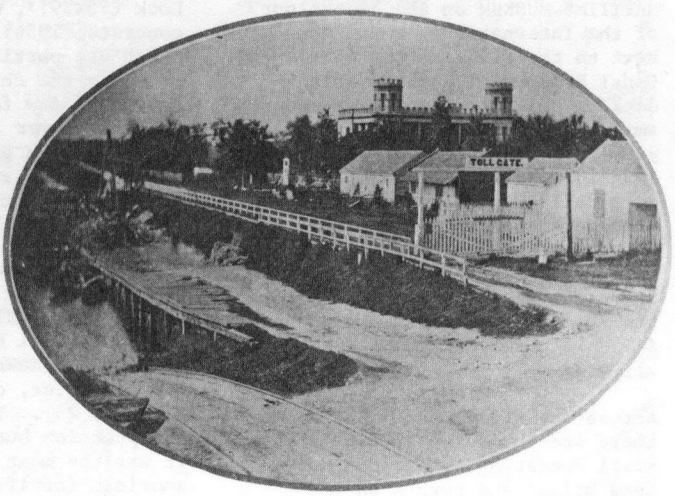
The NEW ORLEANS NAVIGATION CANAL (also known as the NEW BASIN CANAL) paralleled Bayou St. John two miles to the west and was also navigable, with a terminal basin at Rampart and Julia Streets, opposite the New Orleans Passenger Terminal. There was a LOCK (1832-35) on the canal near the Robert E. Lee Boulevard crossing at Conrad St., but the canal was filled in about 1955 and is now Pontchartrain Boulevard and Interstate 10. The north end of the canal, however, is still intact and is the approach to the New Orleans Marina. UTM: Lock, 15.778350.3324250, Spanish Fort LA; Basin, 15.78225.331630, New Orleans East LA.

The INNER HARBOR NAVIGATION CANAL (or INDUSTRIAL CANAL) on the eastern edge of the city links the lake with the river through the INNER HARBOR NAVIGATION CANAL (IHNC) LOCK (75x640', 0-17' lift, concrete, 1923) designed by G.W. Goethals. The lock is at the southern (river) end of the canal in the Coast Guard base at the foot of Urquhart Street. This lock illustrates the technically complex nature of the Mississippi Levee locks, designed both to hold back the river during floods, and to hold back the canal when the river is very low (reverse head). There are two upper (river end) pairs of miter gates, full height, one pair facing in each direction. At the canal end there are two full-height pairs facing the river (for double protection) and one short pair facing the canal. This puts most of the strength of the lock against high water in the river, while making it possible to operate in the reverse direction when the river is low.

The IHNC is on the main line of the GULF INTRACOASTAL WATERWAY (GIWW), stretching 1,100 miles from northern Florida to the Mexican border, a sheltered waterway similar to the Atlantic Intracoastal Waterway, cutting through lowlands and marsh, connecting numerous bays and streams along the Gulf coast. Developed in sections and essentially completed by 1949, it is still undergoing changes. One of



The GALAXY FAITH after collision with the IHNC Lock on April 5, 1972. The lock was repaired in 18 days. (New Orleans District, C of E)



Harvey's Castle and the "Submarine Railway" over the Levee about 1865, before Construction of Harvey's Lock (New Orleans District, C of E)

these is a proposed re-routing through a lock and canal near Violet, to bypass the IHNC which has now become a bottleneck.

The winding Mississippi, too, is a problem, solved by a branch from the IHNC to the Gulf of Mexico, the MISSISSIPPI RIVER-GULF OUTLET (1968) 76 miles long, and 37 miles shorter to the gulf than the winding Mississippi itself.

From New Orleans there are three commercial boat tours which have similar voyages through the Algiers Lock into the bayou and buccaneer country and back through the Harvey Lock. All are daily 5-hour trips costing $6-7 with reservations available at the boats and at most hotels. According to the latest information (subject to change), the VOYAGEUR leaves at 10 a.m. (523-5555) and the MARK TWAIN at 11 a.m. (525-6545) from the foot of Canal Street. The COTTON BLOSSOM leaves at 11 a.m. from the Toulouse St. wharf (586-8777). The VOYAGEUR, PRESIDENT and NATCHEZ (586-8777) also have harbor tours, not going through any locks. Write for brochures on the MARK TWAIN (foot of Canal Street, New Orleans, LA 70130), VOYAGEUR (Louisiana Cruises, P.O. Box 5455, New Orleans 70115) and the NATCHEZ and COTTON BLOSSOM (New Orleans Steamboat Co., Box 2407, New Orleans 70176). New Orleans is also a major terminus for the Mississippi River cruises of the DELTA QUEEN and MISSISSIPPI QUEEN (Delta Queen Steamboat Co., Dept. KSH, 322 E. 4th St., Cincinnati, OH 45202, 513/621-1445) and delta cruises of the ARKANSAS EXPLORER (111 E. 3rd St., Little Rock AR 72201, 501/375-8197).

Also in New Orleans (in addition to Jazz at Preservation and Heritage Halls) is the LOUISIANA MARITIME MUSEUM on the 31st floor of the International Trade Mart next to the river at the foot of Canal Street. The observation deck on that floor offers a panoramic view of the Mississippi, and you might see some of the locks. Open 10-5, closed Sundays; deck open daily 8 a.m. to midnight. New Orleans also has the world's oldest continuously operating streetcar line (since 1835) and the Streetcar Named Desire Exhibit at the French Market near Decatur and St. Philip streets, open Wed.-Sat. all year.

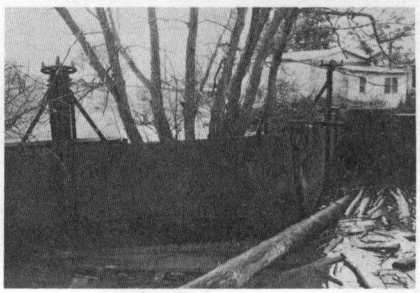
Across the river from New Orleans there are three locks, two of them still operating. Take the Huey P. Long bridge and turn L on LA 18 to Westwego. Where LA 18 turns from the levee and becomes Louisiana Street the walls of the COMPANY (or COMPANY'S or WESTWEGO) CANAL LOCK, are still visible but the gates are gone. UTM: 15.77584.331295, New Orleans W LA.

Four miles E on LA 18 is HARVEY LOCK on the HARVEY (or HARVEY'S) CANAL (U.S. Bus. 90 tunnels under this canal ½ mile south). Take the first road on the left, just east of the bridge, to reach the lock. This canal began as DESTRAHAN'S CANAL, constructed by slaves in the 1720's and later widened for small boats. The 5-mile canal connected the Mississippi at New Orleans with the BARATARIA NAVIGATION to the south. Captain Joseph Harvey inherited the canal through his wife's family and deepened it, but there was only a guard gate (1909), not a pound lock at the Mississippi end where the canal passed through the levee. To carry boats over the levee a "submarine railway" was provided, with horse-powered railways cars which went into the water at each end of the track to pick up and release the boats. The present lock was built by the Corps in 1929-1933 and is of steel and concrete (75x425', 0-19.6' lift) with four pairs of miter gates, two full-height pairs facing the river, and two short pairs facing the canal for reverse head. This was once the primary route of the GIWW, now taken over by the Algiers Lock. UTM: 15.781600.3312100, New Orleans E LA.

ALGIERS LOCK is 10 miles downriver and also leads into the bayou country. From Harvey, take Bus. 90 east, then E on General de Gaulle Drive; bear L onto MacArthur Blvd., left at the end to the levee, R along the Mississippi past the Chalmette Ferry landing, and R on Blythe Rd. to the lock. Or, just take the ferry (free) from Chalmette. Algiers Lock (75x797', 0-8' lift, reinforced concrete, 1956) has sector gates, which are partially opened to fill or empty the chamber, and can work against a few feet of reverse head when the river is lower than the bayous. Both gates can also be opened at the same time to let fresh water into the bayou country - a benefit for the fishing industry.

On the New Orleans side of the river, about 5 miles E of downtown on LA 46, is the RODRIGUEZ CANAL in Chalmette National Historical Park (Visitors Center open daily 8-6, 8-5 in winter, closed Shrove Tuesday and Dec. 25). The canal is now only a depression but on January 8, 1815 it was the moat in front of the American fortifications at the Battle of New Orleans, the last battle of the War of 1812, which made General Andrew Jackson a hero. UTM: 16.211300.3316500, Chalmette LA.

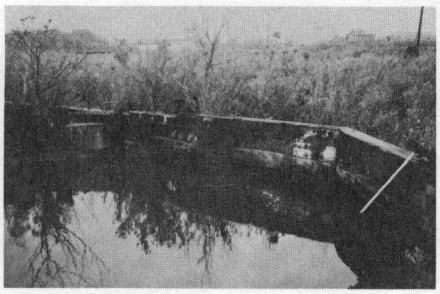
For the same engagement the British built their own canal, VILLERE'S CANAL, 2½ mi. downriver in Mereaux, probably the one still crossed by LA 46 between La Salle Terrace and Rosetta Drive. This canal was constructed to transport small boats from the British fleet on Lake Borgne (an arm of the Gulf) to the Mississippi, and was about two miles long. Completed on Jan. 6, 24 of the boats made it through in time for the battle, before the canal banks started caving in. UTM: 16.214870.3314560, Chalmette LA. For an excellent account of the battle and canals see "Chalmette National Historical Park" by J. Fred Rousch, @ 85¢, #024-005-00178-6 from the Government Printing Office.



The Remains of Violet Lock in 1975

Four miles further downriver from Chalmette on LA 46 is VIOLET LOCK (1939) on the river side of the levee at the S edge of Violet, behind a yellow and white metal building and opposite the end of the LAKE BORGNE CANAL still visible to the east. Privately built, the lock was closed in 1950 and the levee was continued across the lower end, leaving visible only the upper (river end) steel gates and unusual brick walls. This would make a useful quiet historical park overlooking the river. We hope that if the new lock proposed to bypass the Inner Harbor Lock is at this site, the old gates could be bypassed or put on display at the new lock, since there are not many old lock remains left in Louisiana. UTM: 16.219750.3310900, Chalmette LA.

Fifty miles downstream from New Orleans, almost at the end of the "Great River Road" (here LA 23) are the two state-operated locks which give fishing and oyster boats direct access to the Gulf on each side. The EMPIRE LOCK (40x200', up to 12' lift, 1951) is in the town of Empire. Take the turn-off to the left just before crossing the bridge over the canal. This lock has sector gates and is a descendant of the DOULLET LOCK, bought by the state in 1936. UTM: 16.2480.32535, Empire LA 15'. The canal to the Gulf is 10 miles long.



Ostrica Lock #2 in 1975

OSTRICA LOCK is five miles further downriver on the opposite (east) side of the river from Buras. This is a very isolated lock, without road access. After passing the high school on the L, turn L on School Rd. and drive up onto the levee to the Buras wharf, where passenger boats to Ostrica operate at times. You may be able to see the highball of the lock across the river (green if ready, red if not). If no boat is available drive N up the road beside (not on) the levee for half a block to the country store and ask about the Gulf Oil Company's crew boat, which may be kind enough to take a passenger on one of its runs to Ostrica. There is also the possibility of catching a ride on an oyster boat at Empire Lock. The Ostrica Lock (40x250', 12' lift, sector gates, concrete, 1953) is actually 3/4 mi. up the levee (walkable) from the (almost) ghost town of Ostrica, where there are two earlier Ostrica Locks, both of wood with wooden miter gates. The lower (canal) ends of both locks are visible but the river ends have been covered by the levee. The first Ostrica Lock (which we shall call #1) is nearest the row of houses along the canal, was probably constructed in the 1880's and is 16' wide. About 200' S is Ostrica Lock #2, from 1940, 40' wide. The lower gates of both locks are intact but there are no signs of the gate operating mechanism, a walk-around windlass; some exploration is needed. These may be the only wooden locks left in Louisiana, and may be the oldest still remaining. It is fortunate for us that the three successive locks were constructed at different sites. Future lock builders should always consider the possibility of leaving old locks intact. UTM: #1, 16.2550.32508; #2, 16.2553.32508; #3, 16.2545. 32510, Empire LA 15'.

Directly opposite the present Ostrica Lock (#3) in Buras, and indicated on the Mississippi Book of Charts, is the FASTERLING CANAL, said to be the first canal linking the Mississippi with the Gulf, but recent hurricanes have evidently erased the remains of it.

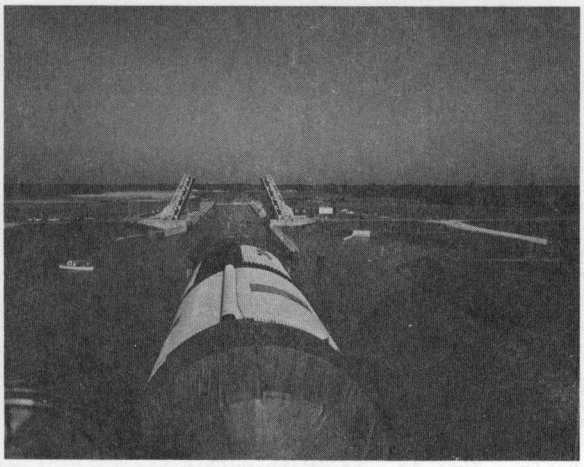
Five miles downriver on LA 23 is Fort Jackson (restored, open daily, free) and on the east bank, Fort St. Philip, accessible only by boat. The very end of the Great River Road is 10 miles further south at Venice, some 20 miles from the several mouths of the Mississippi. One of the mouths is CUBIT'S GAP (mile 3.0) a permanent result of another of the breaches through levees made during the Civil War by the Yankees. GRAND PASS, at "the Jump" (mile 10.5) is another mouth created by a canal, dug by fishermen about 1840.

THE PEARL RIVER LATERAL CANAL, 20 miles long, is part of the 58-mile Pearl River Waterway along the MS-LA state line, from the Gulf up to Bogalusa, begun in 1938 and essentially completed in 1953 after interruption by WWII. Commercial traffic on the waterway (sand, gravel and shells) has declined so much that the navigation is used only for recreation, and the Pearl River has been declared a Louisiana Natural and Scenic River. To arrange for lockage, contact the Lockmaster at Lock 1 (Lockmaster, Pearl River Project, Pearl River, LA, 504/863-7214) or the Lock Operator at Lock 3 (504/886-3141).

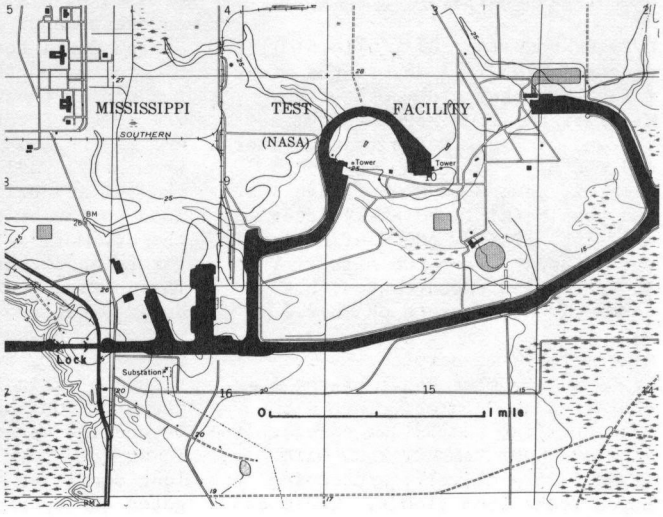
There are three locks on the canal, all 65x310' in the chamber, and accessible from LA 41, which parallels the river. Lock 3 (11' lift) is 5 miles from the upper end and two miles by road from Sun (watch for C of E sign). Lock 2 (15' lift) is 3 miles below, at the end of a ½-mile road 2½ miles below Bush. Lock 1 (27' lift) is a mile above the lower end of the canal, at the end of a 2½ mile road 6.7 miles below Talisheek. UTM: #1, 16.233150.3372500, Hickory LA; #2, 16.22530.348740, Sun LA-MS; #3, 16.22510.349235, Sun LA-MS.

There are launching ramps at locks 1 and 3 and at the Pools Bluff Sill, and portages over the two lateral spillways (sills) on the canal. Picnic facilities are available at Lock 1 and camping is allowed at locks 1 and 3 (get help from the lock operators). A bound book of aerial photo charts of the Pearl River Waterway is available at $1 payable to Treasurer of the United States, from the Mobile District.

On the other side of the Pearl River, in Mississippi, is the MISSISSIPPI TEST FACILITY LOCK (110x675', 15-20' lift, 1965) and a 7½ mile canal network designed to carry NASA's Apollo/Saturn V rocket boosters (and now space shuttle rockets) from the Gulf and lower Pearl River up to the various test stands. Now called the National Space Technology Laboratories (NSTL)



Apollo Saturn V Booster at Entrance of Mississippi Test Facility Lock (NASA Photo)



NASA's Mississippi Test Facility Canal Network (Logtown MS USGS Quadrangle)

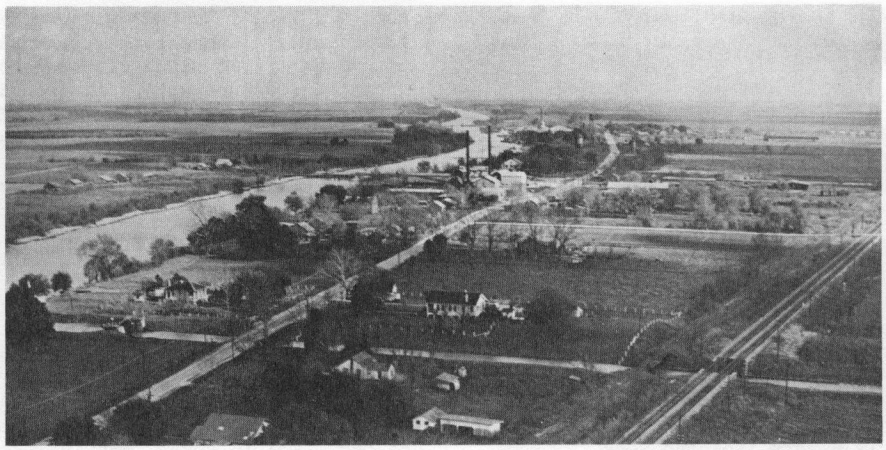
the facility is 8 miles S of Picayune MS, via I-59 and SR 607. There are no regular facility tours, but they can be arranged by appointment (NSTL, Bay St. Louis, MS 39520, 601/688-3341).

From New Orleans, take US 90 west to BAYOU LAFOURCHE, an ancient mouth of the Mississippi which is now cut off from it by the Mississippi levee. The bayou was, and still is, an artery of commerce and has been called "The World's Longest Main Street" - 120 miles long. Of interest to canal park planners are two flash locks on the Theriot Canal, which intersects Bayou Lafourche 2½ miles W of Raceland on LA 649. Watch for a small bridge and a gravel parking lot (R) where there is a small-boat ramp into the canal. The flash lock is a single Tainter (lifting) gate, about five feet wide and electrically operated by buttons on a post in the middle of the canal where they are accessible only by boat. When the gate is opened, small motorboats can pass through on the flood. This small lock, thoughtfully provided by the Bayou Lafourche Fresh Water District, allows flood control while permitting through passage for fishermen. A similar lock is just W up the bayou on the opposite side. Such self-service locks ought to be a part of every park planner's bag of tricks.

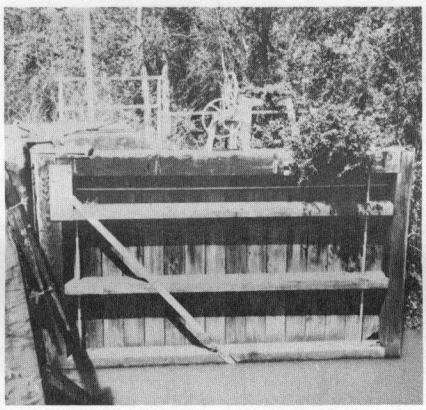
BAYOU BOEUF LOCK is off US 90 in Morgan City. Turn S on Myrtle St. and follow the C of E signs for 1½ mile. This lock (75x1158', 0-11' lift, 1954) is on the main line of the GIWW and protects the country to the east from floodwaters of the Atchafalaya River. It is similar to the Bayou Sorrel Lock, with concrete sector-gate bays and a huge grassed chamber, the barges being held in the deepest part by timber guidewalls.

BERWICK LOCK (45x307', 0-14.5' lift, concrete, 1950) is across the Atchafalaya (another old mouth of the Mississippi) from Morgan City, at the end of Bayou Teche (yet another old mouth), protecting it from floods. Take the US 90 bridge west and turn N (R) immediately after crossing. Follow the C of E signs out of Berwick for two miles. This lock also has sector gates, but a conventional concrete chamber.

Nine miles W of Berwick, US 90 crosses an outlet canal of the Atchafalaya at Calumet. Turn R before or after the bridge to reach the EAST and WEST CALUMET FLOODGATES (1950), respectively, protecting Bayou Teche from floods. These are single pairs of navigable sector gates, not passable when there is a difference in water level. A similar CHARENTON FLOODGATE (1948) is in the levee one mile N of Charenton, also protecting Bayou Teche from the Atchafalaya.



The 937-foot Hanson Canal Lock extends from the upper gates on Bayou Teche (left) to out of the picture at right. (1950 photo by E. Eskine)



Right Lower Gate of the Hanson Canal (Bill Trout, 1975)

The HANSON CANAL is ten miles W of Calumet on US 90 between Garden City and Franklin (Centerville LA quad.) crossed by a small bridge. The concrete upper gate bays of the Hanson Canal Lock are clearly visible to the north (R) at the head of the canal; the wooden miter gates are gone. Surprisingly, the other end of the lock is not even visible from here, 937' to the south beyond the railway bridge. Go S on the road to the SE of the bridge, past the St. Mary's Parish highway garage and across the tracks to a fascinating graveyard of abandoned DKUWs and other amphibious vehicles, descards from the parish rescue fleet, and reminders of the nature of this low-lying delta country. Go through the shrubbery beyond the cargo carrier to find the lower gate bay, which is in excellent condition complete with wooden gates and operating wheels. This is a fascinating, unusual lock which ought to be purposefully preserved, perhaps as a parish park, and placed on the National Register.

Almost as long as a Panama Canal lock, but only ¼ as wide at the gates (26.5') and 60' wide elsewhere, the chamber looks like a normal stretch of canal, although below water level it was once wood lined. Built in 1907 by the Hanson Lumber Company to float log booms from the delta into Bayou Teche, the lock was sold to the U.S. in 1922 and maintained by the Corps until it was abandoned and transferred to St. Mary's Parish in 1959. The 1924 Lockmaster's residence was moved to Berwick Lock in 1951. Although the gates were rebuilt in 1927 and 1949, the original cast-iron sluice or "slush" valves were retained. Mr. Willis Vincent of Verdunville, former lockmaster of this and other Corps locks in the region, explained that when the water level difference was very large - about nine feet - passage through the lock could take as long as 8 or 9 hours, because of the unusual length and the small sluice valves. This lock is worth special attention as a future historic park. UTM: Head of lock, 15.64659.329431; tail (est.) 15.64646.329405, Centerville LA.

Bayou Teche has one lock on its main stream, the KEYSTONE LOCK (36x162', 8' lift, concrete, 1913), 3 miles N of New Iberia from US 90 on LA 31. Watch for the C of E sign at the lock (R). With this lock, Bayou Teche is navigable for over 100 miles. The oldest operating Corps lock in the delta, it has timber miter gates and was hand-operated until 1960 when it was converted to an electrical system. This is one of the most sylvan and relaxing of all the operating locks in Louisiana. UTM: 16.612850.3327000, St. Martinville LA.

Take LA 14 W from New Iberia, then

S on LA 82 and 333 to the end, through Intracoastal City, to the VERMILION LOCK (56x1200', 0-5' lift in either direction, 1933). This is an interesting falling or tumble-gate lock on the main line of the GIWW. The single gates at each end are hinged at the bottom and when open fall flat on the canal bed. In the closed position a wedge holds the gate shut so it can operate against a head in either direction, to protect the rice-growing Mermentau River basin to the west from salt water intrusion, or to maintain the river basin water level, as needed. Other locks with this same function, on the edge of the Mermentau basin, are the Schooner Bayou, Calcasieu and Catfish Point locks. Vermilion Lock is turf-sided with concrete gate bays and wooden guide-walls in the chamber proper. This is an old lock, which the Corps plans to replace with a 110x1200', sector gate, turf-sided lock parallel to it on the south. We hope that as much as possible of the old lock will be retained. (Abbeville LA 15' quad.)

Five miles SW of Vermilion Lock, and only reached by water, is the SCHOONER BAYOU CONTROL STRUCTURE (a double pair of sector gates 75' wide, side-by-side, no chamber) next to the SCHOONER BAYOU LOCK (1913), abandoned in 1951. This lock had a 36x300' turf-sided chamber, 0-3' lift, and wooden tumble gates. It should be possible to visit this lock by renting a boat in Intracoastal City. Schooner Bayou Lock was once on the GIWW main route, which has changed over the years from a series of connected lakes to a continuous canal.

Also only accessible by boat is FRESHWATER BAYOU LOCK (84x600', 1968) near the Gulf end of the Belle Isle Canal, 18 miles S of Intracoastal City by water. It has sector gates and an earthen chamber with timber guide walls, and protects the Mermentau Basin from salt water while providing a sheltered waterway for the fishing, trapping and petroleum industries.

Continue W from Intracoastal City on LA 82. Just beyond Grand Chenier is the Mermentau River crossing. There was once a lock and dam below this point, abandoned by 1917, but further information is lacking. At Grand Lake, about 17 miles upstream, and accessible only by water, is the CATFISH POINT CONTROL STRUCTURE (C of E), with three pairs of sector gates side-by-side (no chamber).

Take LA 27 N, then W on LA 384, crossing the GIWW twice, to the CALCASIEU (CAL ca shoe) LOCK, on the main line of the GIWW where it crosses the Calcasieu River, about 10 miles S of the city of Lake Charles via LA 384, and 5 miles N of the town of Grand Lake. A ferry crosses the GIWW here; the lock is accessible only from the N side (watch for C of E sign). This is one of the locks protecting the Mermentau Basin, where ¼ of the rice in the U.S. is grown. The lock (75x1205', 0-4' lift, 1950) has sector gates and a turf chamber with timber guide walls. The row of white covers protect fire plugs and hoses.

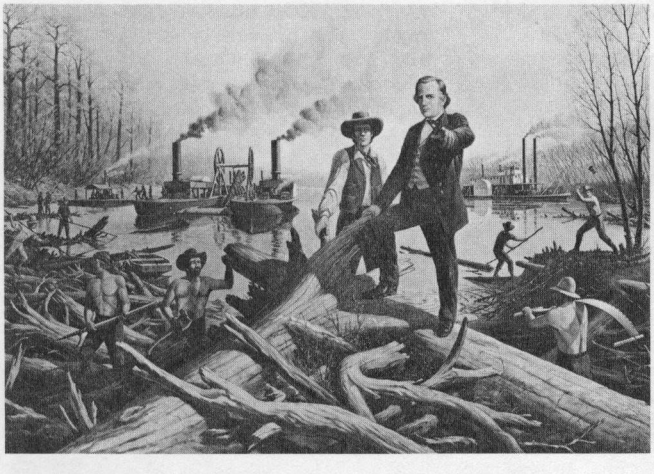
North of Lake Charles is the CALCASIEU RIVER SALT WATER BARRIER (1968), a pair of sector gates in a river cut-off at a dam across the Calcasieu River, designed to keep salt water from moving up the river. The gates are left open and unmanned from October through February. Take the Westlake exit from I-10 and go N; R on Sulphur Ave., L on Muller Ave., R on Bagdad Rd., then 1.8 miles to the lock, following the C of E signs.

Work on RED RIVER WATERWAY LOCKS and DAMS 1 and 2, above the Black River junction, was begun in 1977, with expected completion by 1985 of five locks and dams extending slack-water navigation up to Shreveport, Louisiana. Also planned are locks in the existing Lake O' the Pines, and Caddo Lake, dams, plus another lock and dam in order to reach Dangerfield, Texas, 300 miles above the mouth. Lock chambers will be 84x685' with lifts varying from 18 to 36', and a 9' project depth. A number of cut-offs along the river have already been completed.

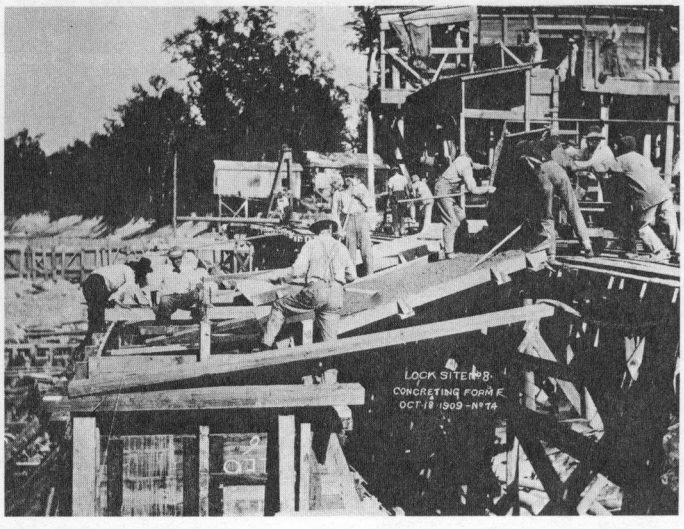
Shreveport was of course named after Captain Henry Shreve, who with his ingenious twin-hulled snagboats began in 1833 the six-year task of clearing the 130-mile log jam, "The Red River Raft" which had blocked navigation into the Red River Basin. See the Vicksburg District History. A scale drawing of Shreve's 1838 snagboat patent is on page 195 of STEAMBOATS ON THE WESTERN RIVERS by L.C. Hunter (Harvard U. Press 1949).

The river saw action during the Civil War when in 1864 a fleet of Union Gunboats, trapped above shallows at Alexandria by low water, escaped after Col. Joseph Bailey built "Bailey's Dam," a pair of wing dams which raised the river level and created a channel through the shallows. There is a marker on US 71 at Pineville, across from Alexandria.

A free brochure on the Red River Waterway is available from the

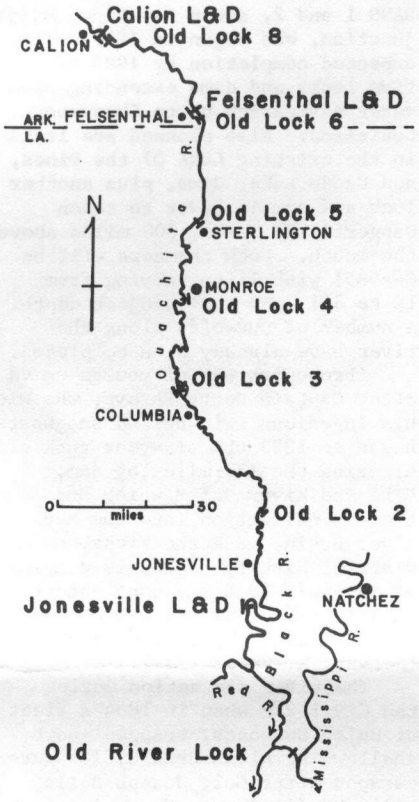


"Captain Henry M. Shreve Clearing the Great Raft from Red River, 1833-1838" by Lloyd Hawthorne, Courtesy of the R. W. Norton Art Gallery, Shreveport, La.; Copyright 1970, The R. W. Norton Art Gallery, Shreveport, La.



Old Lock 8 on the Ouachita Under Construction in 1909 (Vicksburg District)

New Orleans District. Visitors to Shreveport's Ford Foundation Park can see a locomotive from the Panama Railroad (not one of the Panama Canal Electric Mules - these are at the Museum of Transport in Kirkwood MO and the Roanoke Transportation Museum in VA).



The Ouachita River Navigation

The OUACHITA RIVER arises in Arkansas and flows south into Louisiana where it joins the Tensas to form the Black River, which in turn flows into the Red River at Ouachita River Mile 0. The Red has a navigable connection with the Mississippi through Old River, now controlled by Old River Lock and Dam (1963). The Ouachita has had two lock and dam systems over a 350-mile length: the first was a 6½' deep channel with six concrete locks and dams (Old locks 2,3,4,5,6 and 8), all 55x268' in the chamber with steel miter gates, constructed between 1906 and 1926. The second system, begun in 1964, will replace all the old locks with four new ones 84x600' - Jonesville, Columbia, Felsenthal and Calion. All of the abandoned locks (2,3,4 and 5) are now at C of E Public Recreation Areas. Perhaps the lockhouse grounds and parts of the locks are still visible.

From the lower end, the first lock is JONESVILLE L&D (mile 25, 30' lift, 1972) on a cut-off canal on the right bank of the river, 12 miles S of Jonesville on LA 124. OLD L&D 2 (mile 58, 14' lift, 1918, #1 having been eliminated in the planning stage) was on the left bank, at the C of E Harrisonburg Landing Public Recreation Area (picnicking, boat launching) ½ mile upstream from the LA 8 bridge at Harrisonburg. Take LA 8 E ½ mile from the bridge, then LA 922 N to the landing. COLUMBIA L&D (mile 117, 18' lift, 1972) is on a cut-off canal on the R bank, but is reached from the L (east) bank, five miles N of Columbia on US 165 to Riverton, then a mile W on a county road, crossing the old river channel. OLD L&D 3 (mile 118, 15' lift, R bank, 1919) was near the upper end of the old river channel now cut off by Columbia L&D canal, across the river from the C of E Caldwell Landing Public Recreation Area (picnicking, boat launching) 2 miles N of Riverton on US 165, then W 0.7 mile. OLD L&D 4 (mile 162, 9' lift, L bank, 1915) was in the town of Monroe (named after the "James Monroe," first steamboat on the Ouachita in 1819) about 2½ miles S of the I-20 bridge, on US Bus. 165 at the end of Mouton Avenue (no facilities). OLD L&D 5 (mile 193, 7' lift, L bank, 1924) was ½ mile up the river from the LA 2 bridge in Sterlington, at the C of E Sterlington Landing Public Recreation Area (picnicking, boat launching). OLD L&D 6 (mile 224, 10' lift, R bank, 1913) is five miles southeast of Felsenthal, Arkansas. Go straight E from Felsenthal to the river where the new FELSENTHAL L&D (mile 228, 18' lift) is under construction, then R (downstream) along the riverbank for three miles. This lock is still in operation, as is OLD L&D 8 (#7 was eliminated during the planning stage) about 10 river miles below the US 167 bridge at Calion, Arkansas (mile 280, 14' lift, L bank, 1912). Go NE on US 167 for 4½ miles beyond the bridge, S 1½ miles, crossing the tracks, SE three miles and S four miles to the lock. The site for the new CALION L&D (mile 283, 12' lift), still in the planning stage, is a couple of miles upriver from Old Lock 8 and will probably be accessible from Calion. We hope that when replaced, old locks 6 and 8 will be retained as parks.

UTM: #2, 15.613250.3515950, Harrisonburg LA 15'; #3, Columbia LA 15'; #4, 15.583050.3592350, Monroe S LA; #5, 15.585900.3618500, Monroe N LA; #6, Felsenthal AR 15'; #8, Moro Bay AK 15'. Brochures with maps of the Jonesville and Columbia L&D pools are available free from the Vicksburg District. For historical details see the Vicksburg District history.

Free brochures available from the New Orleans District include "Old River," "Channel Improvement and Stabilization, Lower Mississippi River," "Levees on the Lower Mississippi," "Mississippi River - Gulf Outlet," "Your Gulf Intracoastal Waterway" and "Red River Waterway." Many of the Louisiana locks are illustrated in their booklet, "Water Resources Development in Louisiana" (free) and in the District history, THE DELTA ENGINEERS (1971) @ $1.60 ppd. A useful book of charts, FLOOD CONTROL AND NAVIGATION MAPS OF THE MISSISSIPPI RIVER, CAIRO TO THE GULF is available at $6. One can also visit the District offices at the foot of Prytania St. in New Orleans, just upriver from Audubon Park.

A number of nautical charts covering the Louisiana canals and the GIWW are available from the National Ocean Survey, Distribution Division C44, Riverdale, MD 20804. Ask for their free chart catalog #1 (Atlantic). Especially useful are #11354 (Morgan City to Port Allen), #11087 (New Orleans to Calcasieu River, East Section), #11077 (West Section), and #11086 (Mississippi River, Venice to New Orleans).

For help with the Lower Mississippi and Louisiana, many thanks to Mr. Sossaman and others of the New Orleans District; Mr. Anderson and others of the Vicksburg District; Mr. Cresap of the LA Dept. of Public Works; Mr. Brehm of the Sewerage and Water Board of New Orleans; Mr. Vincent of the Hanson Canal Lock, and Mr. Hebert of Plaquemine Lock; Mr. Joe Basco of Ostrica Lock; and Canal Researchers Hayward and Emily Madden.

TEXAS

One of the earliest cuts on the GULF INTRACOASTAL WATERWAY was in Texas, the privately built GALVESTON AND BRAZOS CANAL (1854) between Galveston Bay and the mouth of the Brazos. Although there are a number of locks on the GIWW in Louisiana, the only ones in Texas are the COLORADO RIVER FLOOD LOCKS in Matagorda (75x1,275' in the chamber, 0-10' lift, 1957), one on each side of the river where the GIWW crosses it, to keep floodwaters out of the waterway. These were originally flood gates in 1944, later converted into locks by the addition of a second pair of gates for each. This earlier stage is still represented by the BRAZOS RIVER FLOODGATES (1943) at the Brazos River crossing of the GIWW.

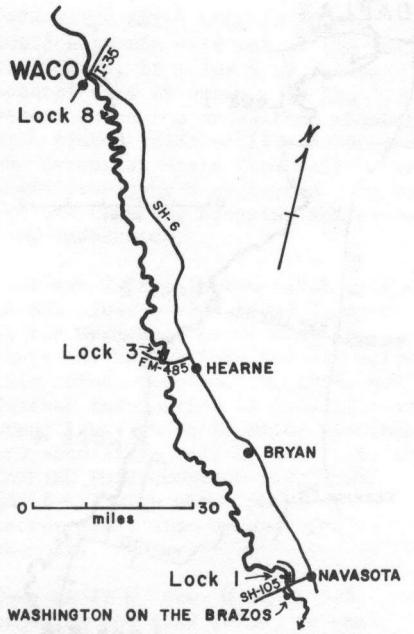
Until 1953 there was a concrete tide lock (1916, 80x600', 1' lift) on the SABINE-NECHES CANAL (1908), now part of the GIWW, 6 mi. above

Port Arthur. This lock was intended to keep salt water out of the rice-growing region upstream, but proved to be such a bottleneck that it was entirely removed.

The HOUSTON SHIP CHANNEL (1914), a branch of the GIWW, is 51 miles long from the Bay to a turning basin in Houston east of US 90 via Clinton Drive. There are no locks. There is an observation platform on Wharf 9, open during daylight, and there are free 2-hour boat tours Tues - Sun, reservations at least 3 months in advance at 713-225-0671. Near the channel is the Lyndon B. Johnson Space Center, on NASA Rd. 1, NE of I-45, with unguided tours daily 9-4 except holidays; call 713-483-4321 for guided tours. On the channel is the San Jacinto Monument and Museum of History, M-Sat 9:30-5:30, Sun 10 to 6, June through Labor Day, then closed most Mondays and Christmas; panoramic view from top of monument. Nearby is the battleship USS TEXAS, open daily 10-7 June - Labor Day and 11-5 Sept. 3 - Apr. 30 except Mondays. Bear Creek Park (camping) is convenient to the channel and its attractions.

For an excellent account of the development of the GIWW in Texas see GUSTODIANS OF THE COAST by Lynn M. Alperin (1977), the Bicentennial history of the Galveston District, $6 ppd. payable to Treasurer of the United States, from the Galveston District. For a history of the Houston Ship Channel see THE PORT OF HOUSTON by Marilyn M. Sibley, University of Texas Press (1968). The GIWW is also covered by the Southern Edition of WATERWAY GUIDE, $9.45 plus tax ppd. from Waterway Guide, P.O. Box 1486, Annapolis MD 21404.

There were two lock-and-dam systems in Texas, both begun in the early 1900's and abandoned unfinished in 1922, leaving ten locks, all of



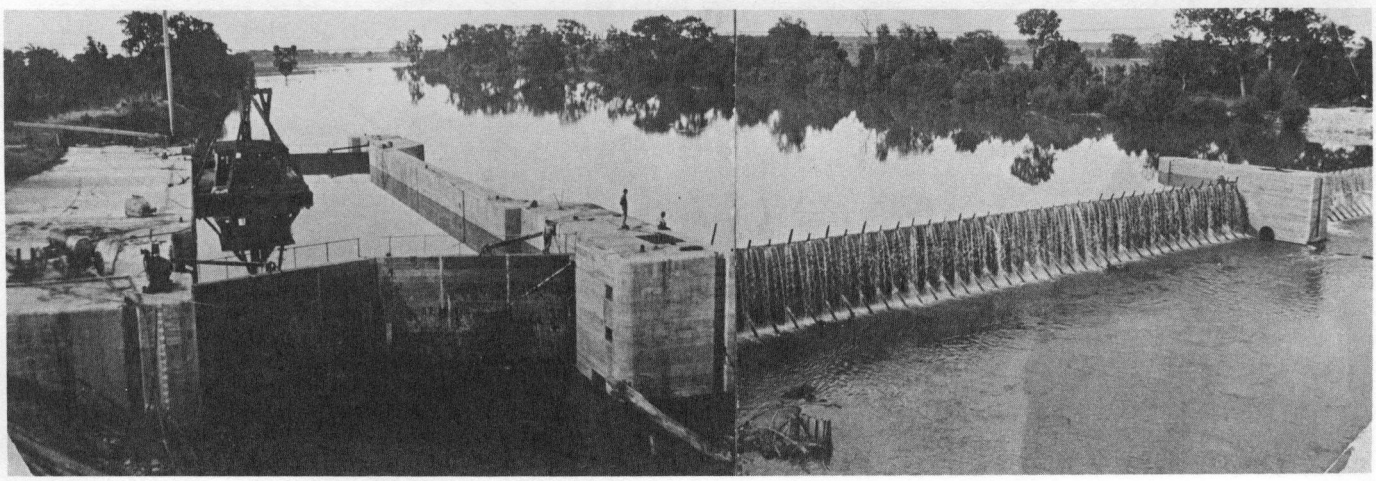
Old Locks and Dams on the Brazos

which are still intact. Work on the BRAZOS RIVER NAVIGATION was begun by the Corps of Engineers in 1905, with the object of making the river navigable up to Waco, 430 miles from the Gulf. Eight concrete locks and dams were planned, all between Waco and the Hidalgo Falls near Navasota, a distance of 176 miles. However, even though a Waco baseball team was called the "Navigators," severe floods in 1913 and 1921, and the suspension of work during WWI, led to the final abandonment in 1922 with only 3 locks begun. Today the locks are still in good condition, but without the gates and without some of the metalwork, salvaged during WWII. Lock 8, below Waco, was left in the middle of a field by a shift in the river during the 1921 flood, but locks 1 and 3 are still in the river bed and are valuable future park or open space sites, deserving particular attention.

The closest to Waco is LOCK 8 (55x140' in the chamber, 15' lift), completed in 1917, on the Coke-Horne plantation (private property) near Downsville. The 1921 flood shifted the river east three-quarters of a mile leaving the lock and lockhouse in the middle of a pasture.

LOCK 3 (55x170', 18.5' lift), near Hearne, was only 68% complete when abandoned in 1922 in the midst of construction, making it a rare time capsule for engineering historians. From SH (State Highway) 6 near Hearne, take FM (Farm Road) 485 W toward Cameron for 6.5 mi. to the Brazos River; the lock is ¼ mi. up the E bank, visible from the bridge, beyond the ruins of the old bridge piers. This lock is well suited for a future roadside park, especially because it is directly across the river from the ghost town of Port Sullivan, 0.7 mi. W beyond the bridge and N on a dirt road for about 1.2 mi. A stone historical marker in a pasture on the R marks the site of the town. No buildings remain today.

LOCK 1 (55x170', 17' lift, 1914), is just W of Navasota (where La Salle was reputedly murdered by his men in 1687) and only 4 mi. upstream of Washington-on-the-Brazos State Park. From Navasota take SH 105 W toward Brenham for 4 mi. (0.7 mi. before crossing the Brazos) and R on FM 159 for 2.5 mi. to railway tracks on the right. Turn L here onto a dirt road (unmarked), past a red barn for ½ mi. to a "T," left (E) one mi. on a one-track road to the locktender's house on a bluff overlooking the river and Lock 1. Go back to SH 105 and W across the Brazos for 2.5 mi. to FM 1155, and S 1 mi. to Washington-on-the-Brazos State Park, four miles downstream on the W bank, where the state has begun an extensive restoration of the town of

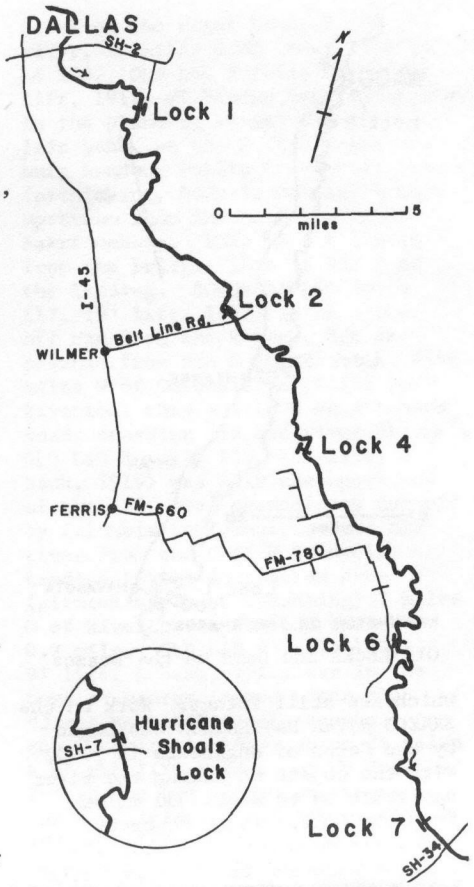

Panoramic View of Brazos River Navigation Lock 8 in Operation about 1917
(Picture Files, The Texas Collection, Baylor University, Waco TX)

Washington, site of the first capitol of the Republic of Texas, as it stood in 1836. It will have a museum and camping facilities. We urge the state to put a sternwheeler on the river at the park, with regular excursions up to Lock 1, a relic of steamboat days, which could become the centerpiece of an exciting historic riverside park.

From Fort Fisher in WACO, the sternwheeler BRAZOS QUEEN makes daily excursions up the Brazos for 4 or 5 mi., not past any locks, but passing under the Roebling (of D&H Canal and Brooklyn Bridge fame) Waco Suspension Bridge (1870), now on the National Register. A brochure is available from BRAZOS QUEEN, 4712 West Waco Drive, Waco TX 76710 (817-772-7500). Take the Fort Fisher exit from I-35. There are campgrounds here and the Texas Ranger Museum, open M-Sat. 9-6, Sun. 1-6, closed Dec. 25.

For a history of steamboating on the Brazos see SANDBARS AND STERNWHEELERS: STEAM NAVIGATION ON THE BRAZOS, by P.A. Puryear and Nath Winfield, Jr., $10 ppd. from Texas A&M Univ. Press, Drawer C, College Station TX 77843. Also of interest is "The Brazos: A Plan for Navigation," by Jerrie Berryhill (unpublished Geology 101 thesis, Baylor University, Waco TX, 1974).

UTM, Lock 1, 14.771700.3364650, Millican TX; Lock 3, 14.720600.3417100, Gause TX; Lock 8, 14.686730.3484100, Robinson TX.



Old Locks and Dams on the Trinity

The TRINITY RIVER NAVIGATION was to go up to Dallas, 501 tortuous miles above its mouth on Galveston Bay, involving 37 locks and dams. There had been a temporary lock and dam at McComas Bluff (later the site of Lock 1) in 1893, which allowed the steamboat HARVEY to operate up to Dallas for two years, but it was not until 1906 that construction by the Corps began on a navigation system. By the time the project was abandoned in 1922 only seven locks had been started; but all were placed in operation: Locks and dams 1,2,4, 6,7,20 (Hurricane Shoals) and 25 (White Rock Shoals). All of these were concrete, with 50x140' chambers. Lock 20 had steel gates (since removed) but locks 1,2,4 and 6 had wooden gates which had to be held down by steel I-beams during floods. There are still remains of gates at locks 4 and 7.

A new Trinity River Navigation has been under consideration, and one lock and dam (Wallisville, 84x600' in the chamber) was begun near the mouth of the river, but work was suspended in 1973 when about 75% complete because of the uncertain effect upon the environment and fisheries of Galveston Bay. It is hoped that if more locks and dams, or a lateral canal, is constructed on the Trinity, some thought will be given to the possibility of keeping the old lock sites intact for use in historic river-oriented parks. At least one lock should be placed on the National Register.

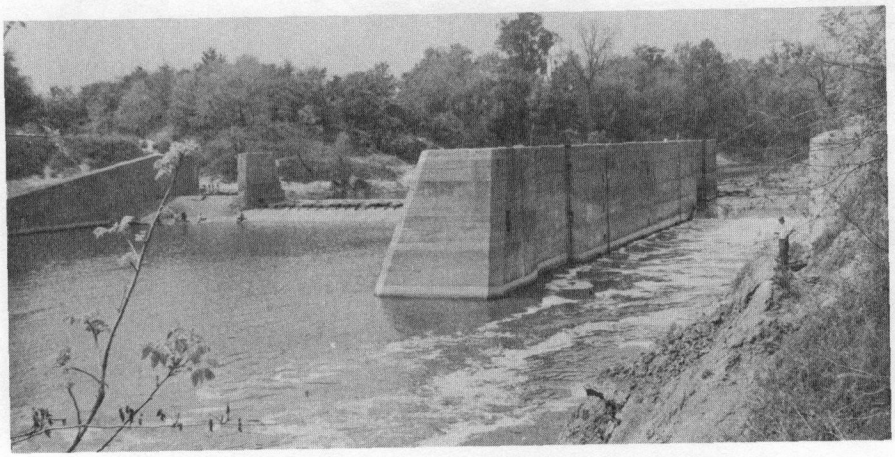
To reach LOCK 1 take Longbranch (then Riverwood) Streets S from SH South Loop 12 in Dallas, to the end. This was the first to be completed, in 1909, and is at the site of the earlier 1893 lock and dam.

LOCK 2 is ½ mi. up the E bank from the Belt Line Road bridge near Wilmer; LOCKS 4 and 6 are off secondary roads from Ferris (see map). LOCK 7 is a mile up the W bank from the SH 34 bridge opposite Rosser; HURRICANE SHOALS LOCK is ¼ mi. by road up the E bank from the SH 7 bridge near Crockett. WHITE ROCK SHOALS LOCK is in the waters of Lake Livingston, SE of Trinity, perhaps visible at low water. Don't neglect the future of these lock and dam sites.

For some details see TRINITY RIVER PARADOX by Floyd Durham (1976), $10 ppd. from Nortex Press, Box 1369, Wichita Falls TX 76307.

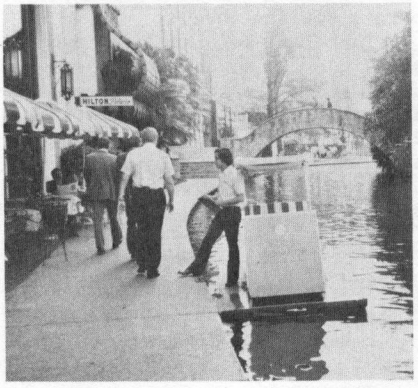
UTM: Lock 1, 14.716490.3619400, Hutchins TX quad; Lock 2, 14.722700.3611450, Ferris TX; Lock 4, 14.727640.3606300, India TX; Lock 6, 14.733990.3598850, India TX; Lock 7, 14.736520.3592160, Rosser TX; Lock 20, 15.247180.3469960, Hall's Bluff TX; Lock 25, 15.279320.3420610, Trinity East TX; and Wallisville Lock, 15.332640.3298910, Anahuac TX.

San Antonio's PASEO DEL RIO, or River Walk, has been used by canal enthusiasts as the very model of one kind of urban canal park. A 3/4 mi. oxbow of the San Antonio River runs through the city center near the Alamo, in a world by itself well below the streets which cross it. A cut has been made across the oxbow, flood gates (cleverly disguised as ornamental arches) have been constructed to protect the bow from floods, and the whole provided with an exciting maze of paths, arch bridges and mysterious stairways to the surface. Restaurants and quiet places line the river and water taxis and paddleboats glide by. The atmosphere is mind-boggling, especially for a canal park fanatic, and is complete with the almost total absence of protective railings - a sign of sanity in this overly protective era. According to the Paseo del Rio Association, few people fall in



Hurricane Shoals Lock and Dam on the Trinity River near Crockett, Texas (H.K. Margrave, Corps of Engineers, 1972)

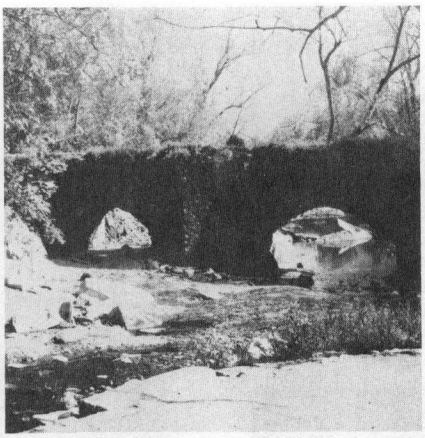
(the water is only a couple of feet deep) and those have usually over-imbibed and have a desire to go swimming. Most of the stonework is WPA work from the depression, with care and imagination hard to duplicate these days. Here one can wine and dine, or just relax on a quiet bench late into the night, an amenity for the visitors which makes other cities positively inhospitable in comparison.



Information Boat on the Paseo del Rio

This valuable park which gives San Antonio its personality was not an accident but the result of fights, hard work and plenty of money, starting with the San Antonio Conservation Society, which was formed in the 1920's to prevent the river from being concreted and used as a sewer! For futher information contact the Greater San Antonio Chamber of Commerce, P.O. Box 1628, San Antonio TX 78296. San Antonio is also the home of the Texas Museum of Transportation, nearby in Hemis Fair Plaza, open daily 10-6.

Of special interest near San Antonio is the ESPADA ACEQUIA (a-CE-kya) which after more than 200 years is still carrying water for 4 mi. from the San Antonio River to the Mission San Francisco de la Espada, crossing Piedras Creek on a famous aqueduct. Take Loop 13 on the southern outskirts of San Antonio, turn S immediately west of the bridge over the San Antonio River, and stop at the dam. The smaller one on the R is Espada Dam, built of flagstones which over the years have been cemented together by calcium deposition from the water. There is no trail at present along the acequia, or canal, from the dam. Drive across the river on the low-water bridge and follow it S to the next road (Ashley); then R to re-cross the river and then the acequia, then L down Espada Road a few yards to the ESPADA AQUEDUCT (UTM 14.552330. 3244730, Southton TX). This was built so well two and a half centuries ago that one can still walk across the 3-arched stone structure, clearly one of the most important early water engineering structures in North America. All of the acequias around San Antonio have been declared a National Historic Civil Engineering Landmark by the ASCE, and the whole Espada Acequia has been placed on the National Register. A useful study of the preservation of the Espada Aqueduct, by David Hoffman, was published in the March 1977 issue of the newsletter of the Texas Chapter of the Society of Architectural Historians (P.O. Box 12473, Capitol Station, Austin TX 78711). For an archeological report on the San Antonio mission acequias see Archaeological Survey Report 17 on the Mission Parkway (1976, out-of-print) by the Texas Historial Commission. Survey Report 19, on an excavation of the ACEQUIA MADRE is HemisFair Plaza is still available at $2 from them at P.O. Box 12276 Capitol Station, Austin TX 78711. A section of this acequia, buried since the 1890's, is now visible, complete with an historic marker. Mardith Schuetz, archaeologist on the project, speculates that these buried stone-lined acequias may have been the source of the legends of "escape tunnels" from the Texas missions!



San Antonio's Espada Aqueduct

The Espada Acequia is just one of the many irrigation and water supply canals covered in WATER FOR THE SOUTHWEST (206 pp., 1973) available at $5 ppd. from the American Society of Civil Engineers, 345 E. 47th St., N.Y., NY 10017. This is part of the work of the History of Engineering Program, Box 4089, Texas Tech University, Lubbock TX 79409. Such canals provide good material for comparative canal engineering studies - the basic engineering problems are the same as for navigation canals - and they also provide good material for linear parks, trails and open space preservation in parts of the country not endowed with proper historic navigation canals. See "Future Canal Parks?" in the February 1979 AMERICAN CANALS.

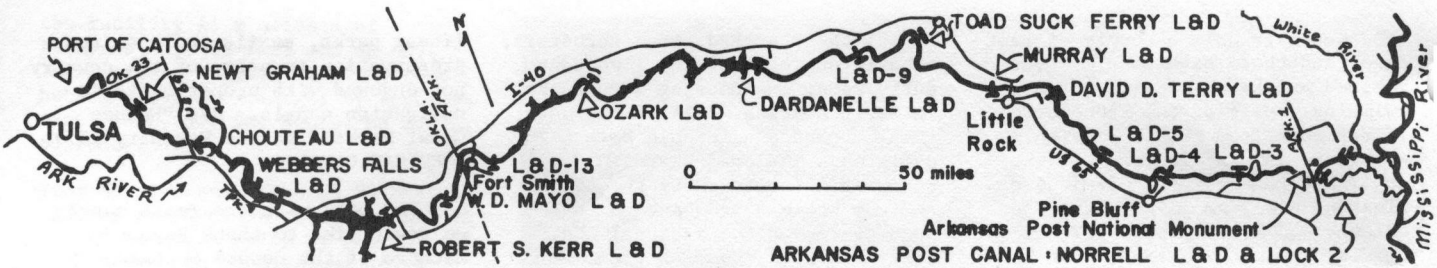
For help with the Texas canals we would like to thank Raymond Michero of the Corps' Southwestern Division, R.G. Craft of the Fort Worth District, J.F. Jadrosich of the Trinity River Authority of Texas, Dr. J.B. Smallwood, Jr. of North Texas State University, Milton Huggett and Nath Winfield on the Brazos, and Kent Keeth of the Texas Collection at Baylor University.

ARKANSAS

Although Henry Shreve's snagboats were clearing the Arkansas up to Little Rock in 1833, there were no locks and dams until the Corps built the McCLELLAN-KERR ARKANSAS NAVIGATION system in 1963-1970. Considered a larger engineering project than either the TVA system or the Panama Canal, and costing four times as much as the latter, the navigation extends 448 miles from the Mississippi River up to the Port of Catoosa near Tulsa, lifting craft a total of 420 feet, exactly the same lift as all the locks and dams on the upper Mississippi.

There are 17 locks and dams on the system, with chambers 110x600', miter gates, and lifts from 14' to an impressive 54' at the Dardanelle Lock. Because the Arkansas carried tremendous amounts of silt during floods, there are also large reservoirs off the main waterway to help trap the sediment which would clog channels and operating equipment. All of the projects have Corps picnic areas and there are camping areas all along the navigation. Of special interest to canal buffs are the camping areas at the locks (2,9,10, 12,13,14 and 17) and at the dam sites opposite the locks (8 and 10). There are visitors' centers with exhibits at Murray Lock and at Lock 13. For a free leaflet describing the waterway, and leaflets on each lock and dam, write the Little Rock District. Also available from them is a set of bound navigation charts @ $4.50. The excellent Bicentennial history of the district by Dr. Floyd M. Clay is now being revised. The Tulsa District history, a political history of the Arkansas Navigation (1975) by William A. Settle, has been published and is available at $5 from the Tulsa District.

The mouth of the Arkansas River Navigation (Arkansas Mile 0) on the Mississippi is actually at the mouth



The McClellan-Kerr Arkansas Navigation

of the White River, which is used for the first ten miles to bypass a long, winding stretch of the Arkansas. The White and the Arkansas are connected by the 9-mile ARKANSAS POST CANAL, constructed along a natural connection used by early steamboats for the same purpose. LOCKS 1 (NORRELL LOCK) and 2 are reached from the north via Tichnor. At the head of the canal, but 25 mi. by road from Lock 2 on AR 1 is the Arkansas Post National Monument, site of the 1686 fort, the first permanent white settlement in the Mississippi valley.

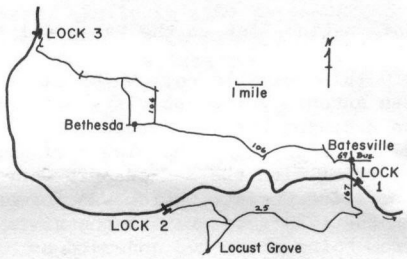
At mile 397.3 the navigation again leaves the Arkansas River and ascends the Verdigris for 51.5 mi. to the upper terminus at the Port of Catoosa, 15 mi. E of Tulsa. The Verdigris, with two locks and dams, required considerable straightening by comparatively narrow cut-offs with passing zones. By using this river to Tulsa, rather than the Arkansas, 9 locks and dams were saved because the Verdigris is 90 feet lower than the Arkansas at Tulsa. Although the locks and dams on the navigation are numbered 1 through 18 (and some have names as well), there are only 17, because foundation problems required moving L&D 12 (Ozark) downstream, eliminating L&D 11 in the planning stage.

For additional information see "The Arkansas River: Valley of Opportunity," free from Smith & Thornton Insurance Service, 3400 First National Tower, Tulsa OK 74103. The Arkansas State Highway Dept., State Highway Bldg., Little Rock AR 72203 has state maps showing the dams. The navigation is much used by recreational boaters and fishermen. Sights to see include Fort Smith National Historic Site (1817) at 111 Rogers Ave. in Fort Smith; the Little Rock River Museum; and the submarine BATFISH (1943) at the Port of Moskeegee, opposite the mouth of the Verdigris. Because of the 9-foot channel depth the sub was "cameled," or lifted between two barges for its voyage.

There are regular 3-day excursions between North Little Rock and Lake Dardanelle, through four locks and back, travelling only during daylight so you can see. Write ARKANSAS EXPLORER, 111 E. 3rd St., Little Rock AR 72201, (501) 375-8197. The converted tugboat PAPOOSE (1940) may also be available now for shorter excursions (River Charter Boat Corporation, Box 9071, Little Rock AR 72209).

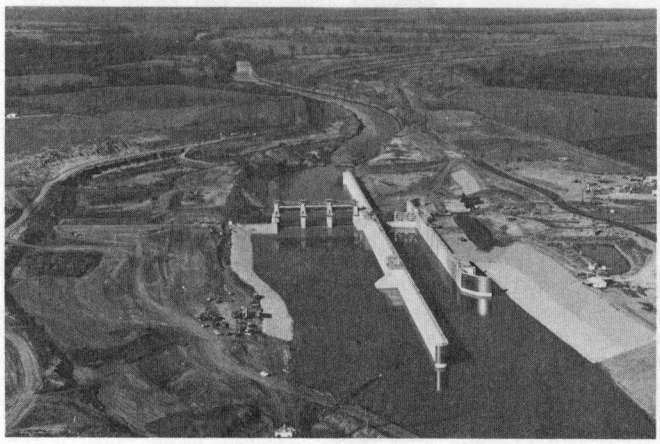
ARKANSAS RIVER LOCKS AND DAMS

Number & Name		mile	open	lift & bank
Mississippi River		0		
1 Norrell	} canal	10.3	1967	30
2		13.3	1968	20
3		50.2	1968	20 L
4		66.0	1968	14 R
5		86.3	1968	17 L
6 David D. Terry		108.1	1968	18 L
7 Murray		125.4	1969	18 R
8 Toad Suck Ferry		155.9	1969	16 L
9		176.9	1969	19 R
10 Dardanelle		205.5	1969	54 L
11 Eliminated during planning stage				
12 Ozark		256.8	1969	34 L
13		292.8	1969	22 R
14 W.D. Mayo		319.6	1971	20 R
15 Robert S. Kerr		336.2	1970	48 L
16 Webbers Falls		368.9	1970	30 L
Verdigris River		397.3 = 0.0		
17 Chouteau		6.4	1970	21
18 Newt Graham		25.7	1970	21 L
Port of Catoosa		51.5		

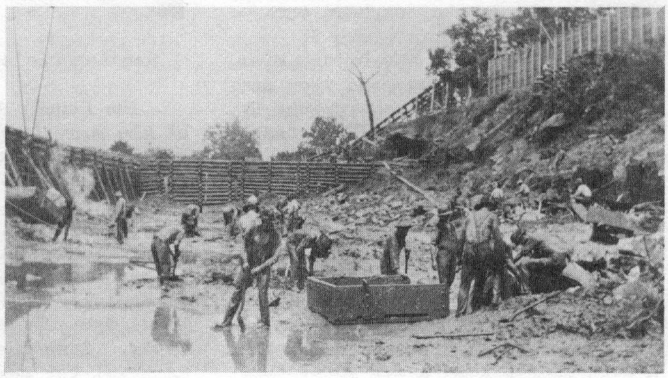


Old Locks and Dams on the White River

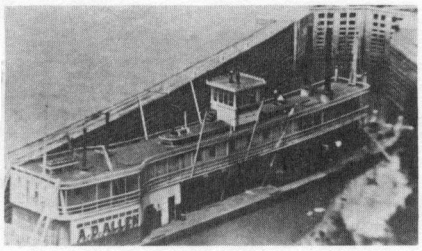
For a time the WHITE RIVER in Arkansas was considered even more important that the Arkansas; ten locks and dams were authorized between Batesville and Buffalo Shoals but by 1908 only three were ever constructed, because meanwhile a railway line had been built up the river valley. Although people



Newt Graham Lock and Dam Under Construction in 1969
(Tulsa District, C of E)



White River Lock 1 Excavation and Coffer Dam in 1900
(Little Rock District, C of E)



The A.D. ALLEN in White River Lock 1 at Batesville Arkansas (Independence County Historical Society)

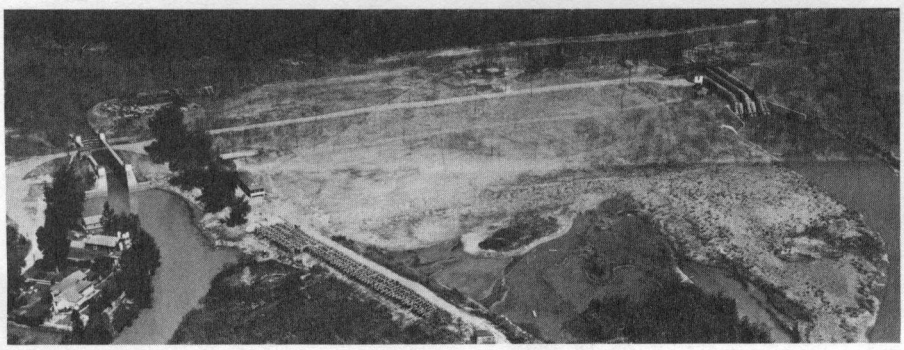
complained that the fixed crib dams did nothing to control floods, and that the three locks were on the only part of the upper river which had been navigable without any, they were in use until 1952 when they were abandoned and sealed. LOCK AND DAM 1 (mile 299.8 on the 1942 C of E map, 16' lift, 1904) is on the left bank at Batesville. Take the US 167 bridge into town, R at the first road for a block, then R across the RY tracks and follow them downstream (L) ½ mi. to the lock, which is in a city park. The dam is still intact; the pond is used by the annual White River Water Carnival each first weekend in August. Except for a steel gate which has been washed 100 yards downriver, the operating equipment is intact. The lock park has rest rooms, water, and a picnic area (no camping).

L&D 2 (Mile 308.5, 13' lift, 1905) is 8 river miles above Batesville on the R (S) bank, 1.5 mi. E of Locust Grove on AR 25 then 3 mi. NW on secondary roads. L&D 3 (mile 320.1, 14' lift, 1908) is on the L bank about 9 mi. W of Batesville on AR 106 to Bethesda then N 2 mi. and W 4 mi. on secondary roads. All three were crib dams with concrete locks 36x147' in the chamber and steel miter gates. For details see the 1904 Corps Annual Report, pp. 3750-3763 (Appendix AAA 18), and the Little Rock District history. A White River Trout Fishing map, down to Lock 3, is available from the Arkansas Department of Parks and Tourism, 149 State Capitol, Little Rock AK.

Also of interest is the museum boat MARY WOODS II, down the White River at Jacksonport State Park, 3 mi. above Newport, which towed log booms on the White for many years before it was donated to the state by Potlatch Forests Inc. in 1967.

When a levee was constructed across the St. Francis River to divert flood waters aound the town of Marked Tree, the MARKED TREE LOCK (24 x 125', 22' lift, 1924) was built in the levee to maintain navigation on the river. Abandoned in 1971, the lock was filled in with the reinforced concrete gates, still open. The ends of the lock and the operating machinery are still visible. To reach the lock go W from Marked Tree for 1½ mi. on US 63, then N along the levee for four miles. A short distance further along the levee is the Marked Tree Siphon (1938), a remarkable device developed by the Corps to carry water across the levee to maintain the flow of the river when necessary. Consisting of three 9 x 288' tubes, the siphon is primed by pumping out the air, and is actually more than 100% efficient because according to the engineers the discharge rate is higher than the intake! For more details see the Memphis District history. UTM 15.73230.394060, Marked Tree AR quad. Such siphons have also been used on canals to control flooding, because they are more efficient than spillways; several self-priming stone siphons were built on a French canal 300 years ago. Their usefulness might be kept in mind for modern canals and canal parks.

For help with the locks in Arkansas, many thanks to Mr. D.R. Rippey and Phyllis McGrew of the Little Rock District, Mr. Kent F. Carmain of the Memphis District, Jim Wilson of the Steamship Historical Society, Fay Lindsey of the Batesville Cahmber of Commerce, Wilson Powell of the Independence County Historical Society, and Mr. Bev W. Morant.



Marked Tree Lock (left) and Siphon, St. Francis River AK (Memphis District)

TENNESSEE

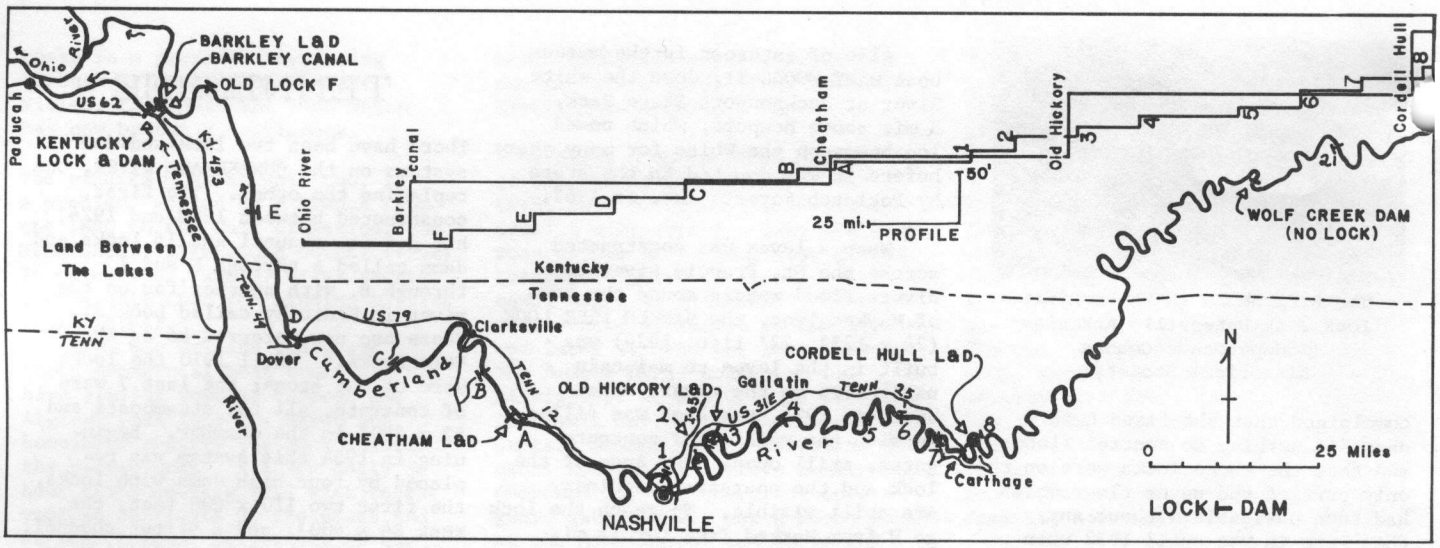
There have been two lock-and-dam systems on the CUMBERLAND RIVER, one replacing the other. The first, constructed between 1888 and 1924, had a 6-ft. channel and 15 locks and dams called A through F and 1 through 8, with another far up the river in Kentucky called Lock 21. These are now referred to as the "Old Locks." Until 1910 the locks were of cut stone; the last 7 were of concrete, all for steamboats and 52 x 280' in the chamber. Beginning in 1954 this system was replaced by four high dams with locks, the first two 110 x 800 feet, the rest 84 x 400', and a 9-foot channel, with the same head of navigation as before, over 300 miles from the Ohio. The old dams were removed, and because of the narrowness of the river the river-side walls of the old locks were removed, except for Old Locks E,F,3,4 and 8, which are all under 20 or more feet of water so were left with the operating machinery intact and the gates closed. Industrial archaeologists of the future will have a field day with these navigation time capsules!

Today there are public access areas or parks at the new locks and at most of the old sites. These are marked on recreation maps of Barkley, Cheatham, Old Hickory and Cordell Hull Lakes available free from the Nashville District. Especially useful is the Nashville District Bicentennial history, ENGINEERING ON THE TWIN RIVERS (1978) by Dr. Leland Johnson, available from the district at $10 ppd. Also very useful is a bound book of navigation charts of the Cumberland, showing the old lock locations, available from them at $4. See also STEAMBOATIN' ON THE CUMBERLAND by Byrd Douglas (Tennessee Book Co., Nashville, 1961).

The following guide covers the navigation, going upstream:

BARKLEY LOCK & DAM (left bank looking downstream, completed in 1964) is the first on the way upstream, 30.6 miles above the Ohio, crossed by US 62. Only 2 mi. W on US 62 is the KENTUCKY LOCK & DAM (Right bank, 1944) on the Tennessee River Navigation. By design, the ponds of these two dams are at the same elevation, and are connected by the BARKLEY CANAL (1966, camping), two mi. above Barkley Dam where the ponds are only 1½ miles apart. Tows going down the Cumberland usually cross here and take the Tennessee River to the Ohio since it is wider, straighter, and seven miles shorter.

Take KY 453 (TN 49) S from US 62,



Plan and Profile of the Old and New Cumberland River Navigations

crossing the canal into "The Land Between the Lakes" (see the book of that name by Frank E. Smith, University Press of Kentucky, $5.95). This is a 40-mile long peninsula which has been developed by the Tennessee Valley Authority into an experimental national outdoor recreation and environmental education area, complete with the remains of an iron furnace and a fort. The major information center is 12 mi. S of the dams, open 9-5 daily. Barkley Dam inundates two of the old locks, F and E, 30 and 20 feet underwater respectively; and the land wall of Lock D, which is about 13' under, on the L bank below the visitors' center (open 8-4:30 daily) at Fort Donelson National Military Park (1862) near Dover.

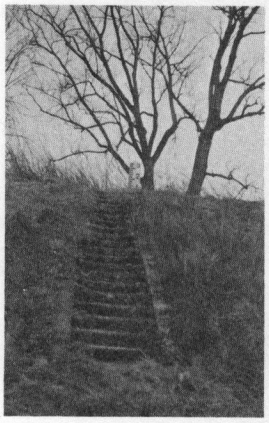
From Dover take US 79 across the river for 18 mi., and just E of Oakwood turn S on Lynville Rd., passing Needmore Church of Christ and L on county road 172081; 1.4 miles after it turns into a dirt road, turn L between two concrete posts just before passing a large mound, on which the lock house once stood. This is OLD LOCK C (1918), the best preserved (above water) of the 7 concrete locks, at Old Lock C Recreation Area. The river wall has been removed but the top of the land wall is 2' above normal water level, with some metal work remaining. There is a broad concrete apron, and steps up the mound to the lockhouse foundations. A popular spot for fishermen, it could be developed into a good canal park with a view from the mound.

Continue E on US 79 into Clarksville. OLD LOCK B, at Old Lock B Recreation Area, is not as well preserved as Lock C. Go S on Rt. 13/48 across the river and after 3 mi. bear L onto Old 48 Hy. for 3.8 mi. to Lock B Road on the L at Jim Jones' Body Shop. Watch for the lockhouse mound with a lone pine on top. Another potential park.

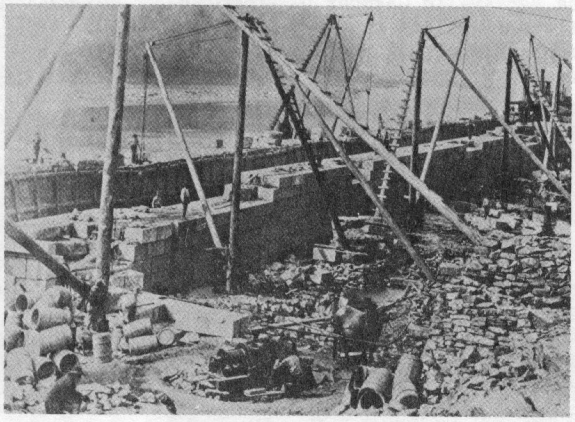
Go back to Clarksville, taking US 41A then 41A By-Pass E through town, then onto TN 12 for 15 mi. to Cheap Hill Community and a C of E sign on the R, "Cheatham Dam and Lock A Recreation Area." CHEATHAM LOCK is visitable but the land wall of OLD LOCK A just upstream is 4' underwater. However, this is the only old lock at present with an historical exhibit so is worth a visit. A nature trail uses the lockhouse mound and there is a section of narrow-gauge railway track which once carried supplies to boats moored at the lock. Camping, swimming (no lifeguards), playground. Visitors are also invited to gather nuts from the 50 pecan trees.

The oldest lock still visible on the river (because Old Lock A, also 1904, is underwater) is OLD LOCK 1, a mile downstream from the center of Nashville. Continue E on TN 12 for 21 mi., L on Rt. 6219 (Buena Vista Pike) just before crossing the river, for 2.6 mi. and R for ½ mi. on US 431 (White's Creek Parkway) to Lock 1 at Lock Road. (From central Nashville, take I-65 N to the Trinity Lane exit, W to US 431 and L ½ mi. to the lock). This lock has been leased to Nashville Metro but there is no park here yet. The remaining land wall, of cut stone, is 3' above water and the lockhouse is occupied and in good condition. There is still a narrow-gauge railway down to the lock. This is a potential small historical park for the Nashville area, which incidentally was from the 1870's to the 1930's the terminus for huge log rafts called "Cumberland River Drifts" about 48 x 280' (to fit the locks), floated down to the sawmills from Celina, near the Kentucky line. For good details see "Rafting Logs on the Upper Cumberland River," by Steven A. Schulman, in the January 1974 PIONEER AMERICA.

The next oldest lock (1907) is OLD LOCK 2, near Opry Land U.S.A. and is a Nashville Metro park with picnic areas and restrooms. This would be a good place for a river exhibit. The remaining land wall of the lock is well exposed and in good condition. There were once two lockhouses on the bluff; the lock



Steps at Old Lock C
(Winnie B. Morton, 1976)



Cumberland Lock 1 Under Construction in 1891
(from ENGINEERS ON THE TWIN RIVERS)

tender's house has been moved elsewhere for use as a residence but the Superintendent's house is still there, used by the park caretaker. It would be interesting to track down all of the other lockhouses on the Cumberland and other rivers in the country to make a comparative study. There should even be architectural drawings in the C of E district offices and in the National Archives.

To get to Lock 2 take I-65 or US 31 N to Briley Parkway and E across the river to McGavock Pike, L to Pennington Bend Road, and L 1½ mi. to Lock 2 Road. Nearby is a commercial campground, and from a pier on Pennington Bend Road near Lock 2 Road, the SEA WITCH makes daily (except Monday) trips up the Cumberland past Old Lock 2 to the homes of country music stars. Opry Land U.S.A. is open daily 10 to 10 from Memorial Day through Labor Day, closed Nov. to mid-April, otherwise open weekends only.

Next upstream is OLD HICKORY LOCK & DAM (1956, L bank). Take I-65 or US 31 N from Nashville, then E on TN 45 to Rayon City, and N to the lock. OLD LOCK 3 is intact, gates and all, 2 mi. upriver but 30' under water; OLD LOCK 4 is also intact but 12' under, near Gallatin. The land wall of OLD LOCK 5 is 12' underwater on the L bank, 2 mi. above the US 231 crossing; the area is a state wildlife refuge.

The land wall of OLD LOCK 6 (cut stone, 1910) is 3' above water at a public access point and could become an interesting canal park. From Gallatin take TN 25 E, and 1½ mi. E of Hartsville turn R at the "Goose Creek Boat Ramp" sign onto Lock 6 Road (unmarked), crossing the creek to the river.

To reach OLD LOCK 7 (cut stone, 1910, L bank), continue E on TN 25 through Carthage, crossing the river, then W on TN 24 for 3.3 mi. and R onto County Road S6311, which leads to Smith County Park (picnicking, rest rooms). The land wall is in very good condition, and both lockhouses are still being used, by park personnel. This is one of the best canal parks on the Cumberland River, and would be an ideal location for an interpretive marker or display.

To reach CORDELL HULL LOCK & DAM (1973), go back through Carthage on TN 24, and 4 mi. beyond, turn N on Elmwood, then about 6 mi. to the lock, on the L bank. OLD LOCK 8 (1924, concrete) is intact but 35' underwater about 3½ mi. above the dam.

Above Lock 8, a number of locks and dams were planned in the early 1900's but only one was constructed, LOCK 21 (1911), almost 200 miles further upstream in Kentucky. It is now inundated by Lake Cumberland (Wolf Creek Dam, no lock), at the end of Lock No. 21 Road, 10 mi. NW of Monticello on KY 92 then 789. This provided a pond up to Burnside KY for packet boats using this section.

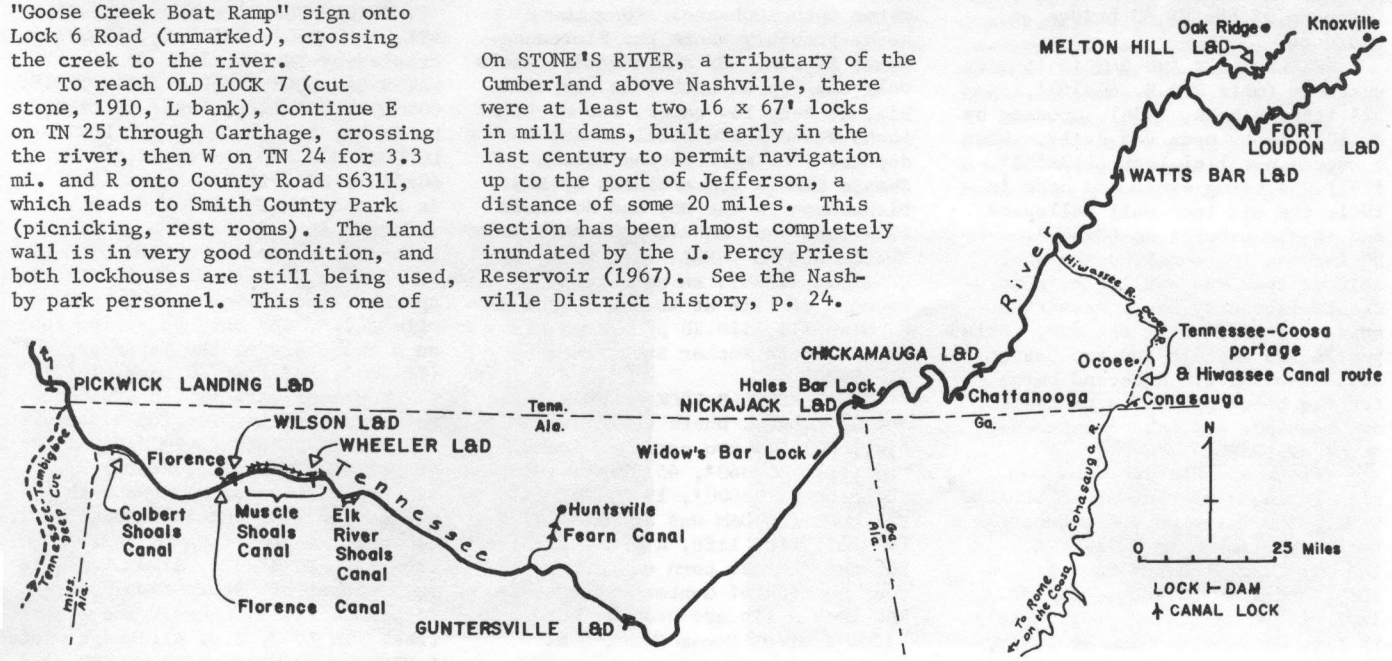
UTM CO-ORDINATES OF OLD LOCKS ON THE CUMBERLAND RIVER NAVIGATION

F	16.4004.40440	Eddyville KY
E	16.413620.4068310	Canton KY quad.
D		Dover TN
C	16.448450.4031100	Needmore TN
B	16.473900.4030400	Excell TN
A	16.482400.4018820	Cheatham Dam TN
1	16.519300.4006700	Nashville W TN
2	16.526750.4010920	Nashville E TN
3	16.5320.40145	Goodlettsville TN
4		Laguardo TN
5	16.56765.401930	Bellwood TN
6	16.576900.4022800	Bellwood TN
7	16.597390.4016800	Carthage TN
21		Jabez KY
7	16.585950.4016020	Dixon Springs TN
8	16.597390.4016800	Carthage TN
21		Jabez KY

On STONE'S RIVER, a tributary of the Cumberland above Nashville, there were at least two 16 x 67' locks in mill dams, built early in the last century to permit navigation up to the port of Jefferson, a distance of some 20 miles. This section has been almost completely inundated by the J. Percy Priest Reservoir (1967). See the Nashville District history, p. 24.

The TENNESSEE RIVER has seen three major canal-building periods, from the first Muscle Shoals (or Tennessee) Canal in 1836 and the second in 1875-1890, to the high dam development early in this century accelerated by the Tennessee Valley Authority after 1933. Today the locks are operated by the Corps of Engineers. There are exhibits at most of the operating TVA dams and most of the turbine rooms are open to visitors. Most famous of these is Wilson Dam, which has a visitor's lobby, and elevators going down to the turbines, open 9-5 daily. Unfortunately, none of the old lock sites are used as parks.

Starting from the Ohio River end, the old and new locks and dams are: KENTUCKY LOCK AND DAM (River mile 22.4, R bank, 1944, 110 x 600' in the chamber with a 75' lift), crossed by US 62 in Kentucky (see Cumberland River map); picnic area, camping near lock. Barkley Lock and Dam on the Cumberland is 2 mi. E, the two ponds connected by the Barkley Canal. PICKWICK LANDING LOCK AND DAM (mile 206.7, L bank, 1938, 110 x 600', 63' lift) is crossed by TN 128; Pickwick Landing Dam State Park on L bank; camping. This is the only lock on the river worked by hydraulic power - the rest are electrified. A new lock (110x 1000') is planned on the landward side of the present one. At mile 215 is Yellow Creek, the northern entrance to the Tennessee-Tombigbee Waterway, now under construction (see Alabama). The COLBERT SHOALS CANAL (1911) was inundated by Pickwick pond; it was 8 mi. long, on the L bank, with a lock at the lower



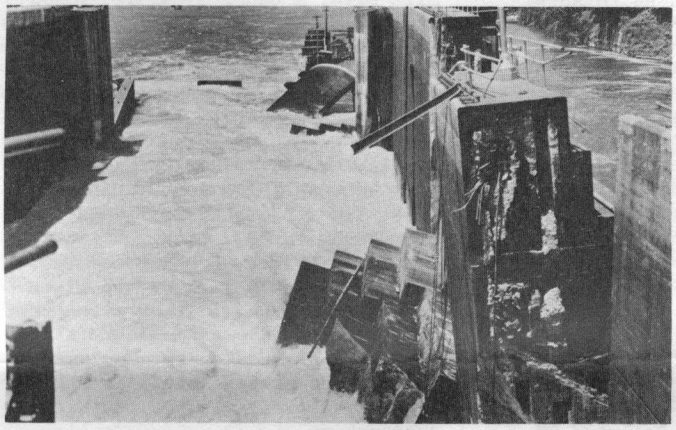
Old and New Locks and Dams on the Tennessee River, and the Ocoee-Conasauga Portage

end at Riverton (mile 226.6). A navigation light marks the spot, which is partially above water.

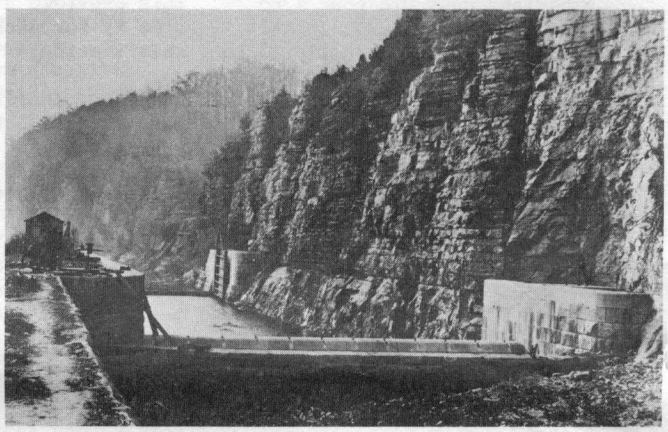
WILSON LOCK AND DAM (mile 259.4 R bank, 1925), crossed by the Wilson Dam Highway, is a National Historic Landmark and was the first high dam on the river. One of the locks is a 2-lock staircase, the lower chamber 60 x 300' and the upper 60 x 292', with a total lift of 100'. Immediately downstream, the FLORENCE CANAL (R bank, 1925) with LOCK AND DAM #1 (mile 256.7, 60 x 298', 10' lift) made the shallows navigable below the dam. However, in 1959 a new single-lift lock (110x600', 100' lift) was added to the Wilson Dam and the Florence Canal was blocked off at the upper end and bypassed by a very deep

Little Muscle Shoals below; steamboaters found that when the river was high enough to run these shoals, they could bypass the canal as well, so it was practically abandoned within a year, closing in 1838. In 1875-1890 the U.S. built the second MUSCLE SHOALS CANAL which had 9 locks (#s 5-9 with falling upper gates) and an aqueduct over Shoal Creek, closely following the original line along the right (N) bank from mile 277.0 (Lock 1) to 263.5 (Lock 9), with locks 1-4 57x275' in the chamber, and 5-9, 57 x 283½'. A railroad along the river embankment was used for maintenance and to assist the passage of boats. This time the shoals upstream were taken care of by the ELK RIVER SHOALS CANAL, 1.5 mi. long on the L bank

424.7) has two locks, 110x800' and 110x600', 39' lift, both 1967, on the R (N) bank. HALES BAR LOCK AND DAM was at mile 431.1 (60x265', 41' lift, 1913) but because of a poor foundation became leaky and was replaced by Nickajack. The lock walls, on the R bank, are used for loading by the Tennessee Consolidated Coal Company. Hales Bar (and Nickajack) dams flooded out one of the most dangerous stretches on the river, through the "Grand Canyon of the Tennessee" below Chattanooga, including THE SUCK at the Hamilton Co. line (mile 451.5) where boats tended to go around in circles - or so the stories go. In the 1830's or '40's a stone wing wall parallel to the shore provided a channel through which boats could



The Collapse of the Old Wheeler Lock in June, 1961. The new lock excavation is off right.(WATERWAYS JOURNAL)



Second Muscle Shoals Canal Lock 8 Under Construction (1887 C of E photo from the National Archives)

channel. Lock 1 is now used as a rail-barge coal transfer facility by the L&N RR and can be seen just upstream of the US 43 bridge at Florence.

WHEELER LOCK AND DAM is 15 mi. upstream (mile 274.9, 60x360', 52' lift, R bank, 1936), crossed by AL 101; lobby open 9-5 daily. When a second parallel lock (110x600', 1963) was being excavated here in 1961, the old lock wall collapsed and it was rebuilt to 60x400'. During the 10½-month period while neither lock was available, considerable ingenuity was necessary to transship goods over the dam, including liquid asphalt and two Saturn rocket boosters! A second barge for the boosters had to be hastily constructed, and was christened the COMPROMISE.

Wilson and Wheeler dams completely inundate the MUSCLE SHOALS CANAL, the first on the Tennessee. Built by Alabama in 1831-36 it was 14½ mi. long with 16 stone lift locks and 1 guard lock, each 32 x 120' with 5' lifts. Unfortunately, in part because of lack of funds, the canal was not long enough to bypass Elk River Shoals above, or

with a lock at each end, Lock A (mile 286.2) and Lock B (285.1). At Little Muscle Shoals, dams shunted water into a channel along the R bank, probably where the Florence Canal is now. Of these early canals only the top of Lock 3 is now visible, at very low water, and at least Locks 4 and 6 are still intact in the depths. For more on the Muscle Shoals Canals see articles by L.W. Richardson in the May and November 1977 issues of AMERICAN CANALS, and MUSCLE SHOALS CANAL: LIFE WITH THE CANALERS (1978), an excellent account of life at Lock 6 by Joshua N. Winn III, $10.20 ppd. from him at 437 North Poplar St., Florence AL 35630.

GUNTERSVILLE LOCK AND DAM (mile 349.0, R bank, where there is an overlook) has two parallel locks, the first 60x360', 45' lift, 1939; the other 110x600', 1965. WIDOW'S BAR LOCK AND DAM was at mile 407.6 (60x265', 16' lift, R bank, 1925) but the dam was torn out after the construction of Guntersville L&D. The lock walls are used by the Widow's Creek Steam Plant near Bridgeport.

NICKAJACK LOCK AND DAM (mile

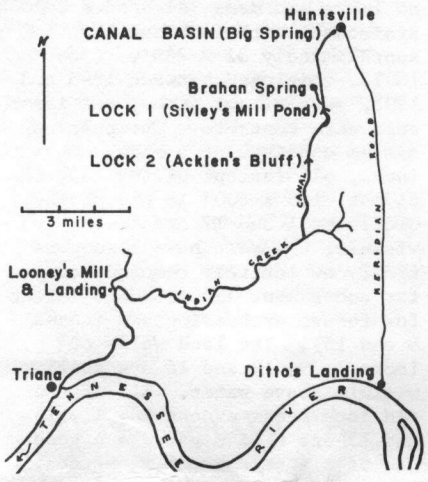
be warped upstream past this strong eddy, using a horse-operated windlass on the bank.

CHICAMAUGA LOCK AND DAM (mile 471.0, 60x360', 53' lift, 1940) is crossed by TN 153; lock on R bank. WATTS BAR LOCK AND DAM (mile 529.9, 60x360', 70' lift, 1942) is crossed by TN 68; lock on L bank. FORT LOUDON LOCK AND DAM (mile 602.3, 60x360', 80' lift, L bank, 1943) is crossed by TN 95. When constructed it had the highest single lift in the world. MELTON HILL LOCK AND DAM is just above TN 95, 23 mi. up the Clinch River from Tennessee mile 567.8, the only operating lock on a tributary of the Tennessee (75x400', 60' lift, R bank, 1963).

For more details (in addition to the Nashville District history) see THE TENNESSEE RIVER NAVIGATION SYSTEM, TVA Technical Report 25, 423 well-illustrated pages with a map of the 1890 Muscle Shoals Canal, $3 from TVA at 416 Union Ave., Knoxville TN 37902. Also available is a packet of "Recreation Maps - Tennessee Valley Lakes," one set free. In 1937, J.H. Alldredge wrote A HISTORY OF NAVIGATION ON THE TENNESSEE RIVER SYSTEM for TVA,

published by the Government Printing Office. For steamboating see STEAMBOAT DAYS ON THE UPPER TENNESSEE ($3) and STEAMBOAT DAYS ON THE TENNESSEE RIVER ($2) by Frank L. Teuton, from the author at 9102 Riverside Dr., Washington D.C. 20022. A bound book of navigation charts of the river is available @ $5 from the Nashville District.

Visitors to Chattanooga might also be interested in the Tennessee Valley Railroad Museum at 2202 N. Chamberlain Ave., open weekends and holidays June - Oct.



The Fearn or Huntsville Canal (from a map by Sarah Huff Fisk)

The FEARN CANAL, completed in 1831 by the Indian Creek Navigation Co. under Dr. Thomas Fern, was Alabama's first canal, designed to link Huntsville with the Tennessee River, providing a route for poled keelboats carrying cotton bales and other goods from this region. Also known as the Huntsville Canal and the Indian Creek Canal, it was about 16 mi. long, beginning at a basin in the center of Huntsville at Big Spring (still a Huntsville showplace, and interestingly only a block south of the intersection of Clinton Avenue and Gallatin Street). The upper 2½ mi. was excavated canal, with 2 wooden locks near what is now the Huntsville airport, at approximate UTM co-ordinates of 16.53698.383930 and 53652.383710, Huntsville AL quad. Because these were the first locks in Alabama, and the only wooden ones now known in the state, these sites deserve some archaeological investigation; unless recent channelization has cut through both sites, most of the wood should be intact underground. The lock dimensions would have been appropriate for the keelboats of the day, which were about 40 to 80 feet long and 7-10' wide.

The rest of the navigation used Indian Creek, which now flows through Redstone Arsenal, where one can take a simulated trip to the moon at the Alabama Space and Rocket Center (open 9-6 Je-Aug; 9-5 Sept-May). Lew Richardson suggests that both Huntsville and the Space Center should consider exhibits on their heritage "From Keelboats to Space Ships," and at the least, an historical marker should be placed at the basin in Huntsville.

For details see "The First Alabama Canal" by L.W. Richardson, in the February 1977 issue of AMERICAN CANALS.

The HIWASSEE CANAL was one of the schemes to link the Tennessee River basin with the Gulf, and although the canal was never begun, the route was a well-used one, beginning as an Indian portage some 400 years ago. It connected the Ocoee River (a branch of the Hiwassee, which enters the Tennessee at mile 501, above Chattanooga), with the Conasauga River, a branch of the Coosteenaula, which in turn runs into the Coosa at Rome, Georgia, and thence to the Gulf.

In the early 1800's this route began to be used for what was probably one of the first organized amphibious operations in this country, when two Cherokees established boat yards and stores at the termini, "Hilderbrand's" on the Ocoee (near the town of Ocoee), and "McNair's" on the Conasauga, near Conasauga, and for a fee would haul laden boats over the route in heavy wagons with as much as 6 span of oxen. It was reported in 1827 that during the year, 12,000 gallons of whiskey alone had travelled this route! The boats hauled over this 12-mile route were not light bark canoes, but wooden keel boats, one known to have been 6' wide and 50' long, capable of carrying 100 barrels.

In 1827 this route was surveyed for the Hiwassee Canal, but it was never built. There is little to be seen today of the portage and its activities. Hilderbrand's is 2 mi. E of US 411 and ½ mi. N of US 64, below Lake Ocoee; McNair's is 100 yds W of US 411, ½ mi. N of the GA line, all in Polk County, Tennessee. There is an historic marker where the McNair home was; one can still see the Hilderbrand mansion. Perhaps there are still signs of navigation on the Ocoee or Conasauga, such as sluices and wing dams.

For details see "The Hiwassee Canal," by L.W. Richardson in the May 1976 issue of AMERICAN CANALS. We would be very interested in information about other such portages in this country.

The Hiwassee was also to be part of the SOUTHERN ROUTE, a visionary scheme in the 1830's to rival the Erie Canal by connecting the headwaters of the Kentucky, Cumberland and Tennessee Rivers with the Atlantic coast by way of a tunnel through Cumberland Gap. Little more than surveying was ever done on this and other trans-Allegheny waterway schemes, which would make an interesting study. See the Nashville District history, p. 46.

The DUCK RIVER SLACK-WATER NAVIGATION was intended to take steamboats from the Tennessee River up to Columbia TN, some 70 miles, via nine wooden locks and dams. Construction began in 1851 on the two nearest Columbia and the first was completed. However, at that time a new survey showed that the drop in the river was twice that which had been thought, which on top of the usual cost overruns led to the abandonment of the project. Dr. Johnson proposes that the Columbia Municipal Dam, 3.5 mi. below the TVA dam, may be on the site of Lock and Dam 1 (mile 133.4), and Lock and Dam 2 remains may be those seen at either mile 113.9 or 104.3. Canoeists should look for the wooden lock remains. See the Nashville District History, pp. 38-41.

There were apparently a number of isolated early locks in Tennessee, most of them built by mill owners in their mill dams, as required by law. The remains of one of these has been seen at David Ross's Mill Dam on the North Fork of the HOLSTON RIVER near Kingsport. This 36 x 80' lock was constructed in 1805 with funds from the states of Virginia and Tennessee, to permit through navigation of flatboats carrying salt down from Saltville, VA. Other known navigation improvements in the Tennessee River watershed are wing dams constructed in the 1880's by the Corps along 40 mi. of the FRENCH BROAD RIVER in North Carolina, between Brevard and Asheville. These might still be visible and used by canoeists, who should keep an eye out for other historic streambed sites. See the FRENCH BROAD RIVER GUIDE, $1 ppd. from Land-of-Sky Regional Council, Box 2175, Asheville NC 28802.

For help with the canals in Tennessee, many thanks to Winnie B. Morton, who did our field work on the Cumberland; Dr. Leland R. Johnson, who has explored the rivers he writes about; Louis M. Gwin of the TVA Information Office; Miss Janice L. Strickland of the Nashville C of E District; James Wilson, Frank L. Teuton, Frank Fly, Joshua Winn III, and L.W. Richardson. Anyone interested in exploring rivers in Tennessee should contact the Tennessee Scenic River Association, Box 3104, Nashville TN 37219.

ALABAMA

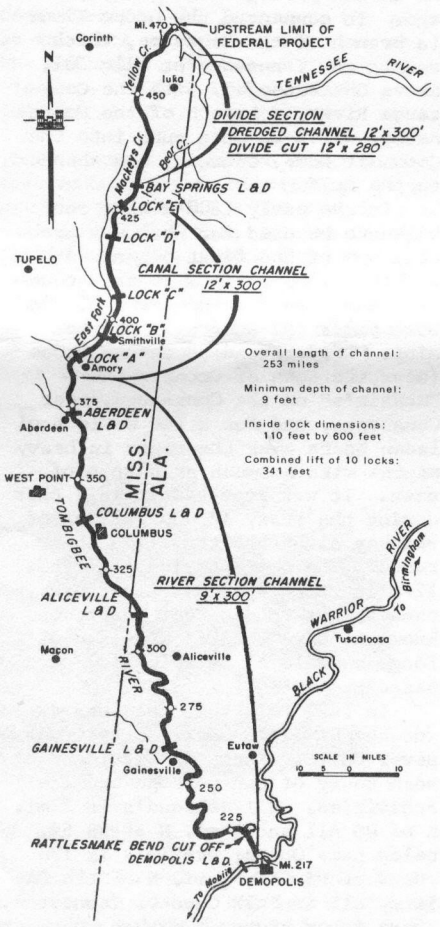
The TENNESSEE-TOMBIGBEE WATERWAY, begun in 1972, is an ambitious project designed to link the Tennessee River basin with the Gulf of Mexico, via the Tombigbee River. Such a connection had been suggested as far back as the early 1700's, when Sieur de Bienville, who founded Mobile in 1702 (and New Orleans in 1718) included it in his report to the King of France; but the first real survey was not made until 1874. At that time it would have taken 40 locks to make the connection; now only 10 large locks, all but one with about 30' lifts, are needed for the 341' change in elevation. All will be 110 x 600' in the chamber, to take 3 barges abreast - the present standard on the Tennessee and Tombigbee rivers. The Tenn-Tom uses the Black Warrier-Tombigbee Waterway from Mobile up through Demopolis Lock and Dam; then the Tombigbee for 168 miles (the RIVER SECTION); then a 45½ mi. lateral canal (the CANAL SECTION) along the E side of the East Fork of the Tombigbee; and lastly, an 84' lift by Bay Springs L&D into the DIVIDE SECTION, a cut 39.3 mi. long and up to 175' deep with passing places every 4 mi., terminating at Yellow Creek on the pond of the Tennessee River's Pickwick L&D.

There are 4 locks and dams on the River Section: GAINESVILLE L&D (mile 266 above Mobile, 36' lift) is at the lower end of a cut-off canal, 1 mi. NE of Gainesville AL on AL 39. ALICEVILLE L&D (mile 311, 27' lift) is 1 mi. SW of Pickensville AL. COLUMBUS L&D (mile 342, 27' lift) is about 4 mi. NW of Columbus, Mississippi; and ABERDEEN L&D will be just upstream of Aberdeen MS.

The Canal Section is between Amory and MS 4, paralleled a few miles to the E by AL 25, with five locks called A through E close to Amory, Smithville, Fulton, Fairview and Kirkville, respectively.

BAY SPRINGS L&D will be just N of MS 4, E of the Tishomingo-Prentiss County line; the 84' lift is one of the highest in the country, and will back up water for 39 miles through the Divide Section to the Tennessee River. This lock and the Divide cut are under the Nashville District; the rest is under the Mobile District. Requiring almost 3/4 as much earthmoving as the Panama Canal, the Divide Section should provide some very interesting displays of modern earthmoving techniques during the next few years. The deepest part of the cut should be near Holcut MS on MS 364, via MS 25 S from Iuka. Navigation is already open up to Aliceville. The whole waterway is now under contract and scheduled for completion by 1986.

The Tenn-Tom project was one of the first major ones to test the effectiveness of the National Environmental Policy Act (NEPA) and the move to include more esthetic, cultural and environmental considerations into project design and cost analysis. This has delayed the project but has focused more official thought and money on alleviating side effects of this mammoth undertaking. See THE TENNESSEE-TOMBIGBEE WATERWAY: A CASE STUDY IN THE POLITICS OF WATER TRANSPORTATION by W.H. Stewart Jr., Bureau of Public Administration, University of Alabama, University, AL (1971).



The Tennessee-Tombigbee Waterway (South Atlantic Division, C of E)

A free brochure on the Tenn-Tom is available from the Mobile District Box 2288, Mobile AL 36628, and another from the Tennessee-Tombigbee Waterway Development Authority, P.O. Drawer 671, Columbus, MS 39701, which in 1978 donated more than 50,000 documents on the history of the project to the Mississippi University for Women in Columbus, MS. For a good bibliography on the Tenn-Tom see the ALABAMA PLANNING RESOURCE CHECK LIST, SERIES 2, free from the Alabama Development Office, State Planning Division, State Capitol, Montgomery AL 36130. Their SERIES 1 covers other river basins in the state.

The BLACK WARRIOR-TOMBIGBEE WATERWAY is a 9' channel 453 mi. long from Mobile on the Gulf, up the Mobile, Tombigbee, and Black Warrior rivers to Port Birmingham, 20 mi. W of Birmingham, Alabama. The original navigation system, constructed between 1888 and 1915, had 17 numbered locks and dams (#17 had a 2-lock staircase) with lock chambers approximately 52 x 285'. Locks 10-13, completed between 1895 and 1905, were of cut stone; the later ones were concrete. The present system consists of 6 high dams with locks, all (except Oliver L&D, the oldest) 100 x 600' in the chamber. Old locks 1 and 17 are intact and visible; the rest have been partially or entirely removed, or are far underwater and presumed intact for future archaeologists (Locks 4 and 15). The land walls of locks 3, 9, 12 and 16 are still visible above water. All of the old lock sites except 10, 11, 16 and 17 are C of E parks - a good use of historic canal resources.

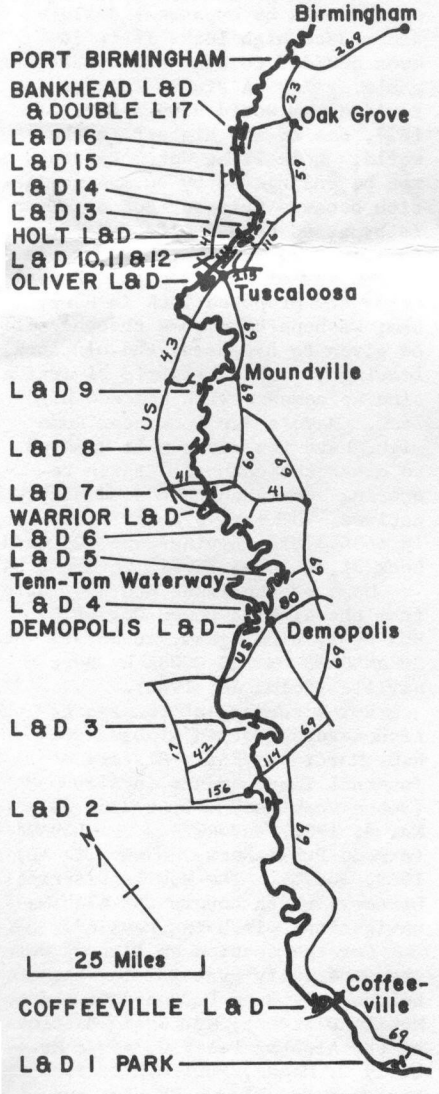
From Black Warrior-Tombigbee mile 0 at Mobile, these locks and dams (the old ones numbered, the modern ones named) are: LOCK & DAM 1 (mile 99.8, L bank, 9' lift, 1909) is still entirely intact, bypassed by a cut-off channel through the river bend, and is a Corps park 4 mi. W from Rt. 69, N of Mays Crossroads. Watch for the C of E sign. Water, restrooms, no camping. This is the only one of the old locks which is intact above water, and in a park.

The COFFEEVILLE (formerly Jackson) L&D (mile 116.6, 34' lift, R bank, 1960) is 3 mi. W of coffeeville on US 84, just W of the bridge. Note the large earth mound on which the lockhouses have been built, a precaution against floods taken at quite a number of Corps locks. Camping at service area. Both lock walls at LOCK & DAM 2 (mile 168.5, 12' lift, R bank, 1915, camping) have been removed, as has the river wall of LOCK & DAM 3 (mile 190.9, 10' lift, R bank, 1915). The wall is visible at low water. Boat Ramp, no camping.

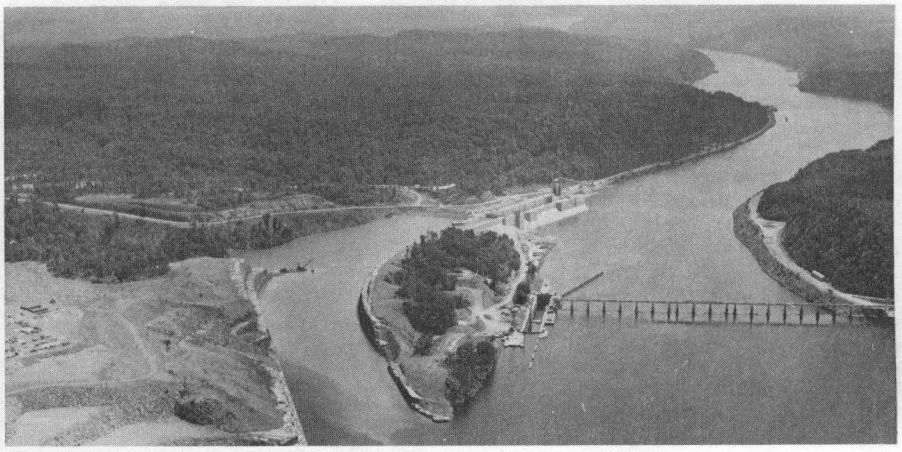
DEMOPOLIS L&D (mile 213.2, 40' lift, L bank, 1954) is 3 mi. W of Demopolis, just N of Shortleaf; water, picnicking, no camping. LOCK & DAM 4 (mile 216.6, 10' lift, R bank, 1908) is 20' underwater, just below the mouth of the Black Warrior River (no water or camping). LOCK & DAM 5 (mile 232.0, 10' lift, L

bank, 1908) still has its land wall, 12' underwater; water, camping. LOCK & DAM 6 (mile 252.3, 10' lift, L bank, 1908) also has its land wall, 3' below low water; picnicking, no water.

WARRIOR L&D (mile 261.1, 22' lift, 1957) is in a mile-long cut-off canal across a horseshoe bend on the L bank, just above what the navigation map calls "Pole and be Damned Reach." The lock is 5 mi. SW of AL 14 above Sawyerville and SE of Eutaw. LOCK & DAM 7 (mile 262.3, 10' lift, L bank, 1903) has its land wall, 8' underwater; camping; as has LOCK & DAM 8 (mile 277.8, 10' lift, R bank, 1903); camping on L bank. LOCK & DAM 9 (mile 293.2, 10' lift, R bank, 1902) is the oldest of the concrete locks and still has its land wall, about 10' above water (no camping or facilities). This is across the river from Moundville State Monument and Museum (9-5 daily except Dec.



Old and New Locks and Dams on the Black Warrior-Tombigbee Waterway



Old Lock 17 (foreground) on the Black Warrior-Tombigbee, and the New Bankhead Lock and Bypass Under Construction in 1975 (Mobile District)

25) where there are 40 mounds, with restorations and artifacts, from a prehistoric city.

The WILLIAM BACON OLIVER (Tuscaloosa) L&D (mile 338.1, 28' lift, L bank, 1939) was the first of the modern high dams on the river and is about 1 mi. downstream of the AL 69 bridge in Tuscaloosa (Choctaw for "Black Warrior"). LOCKS AND DAMS 10, 11 and 12 (cut stone, 1895) were the first old locks on the river and were at first called locks 1, 2 and 3 respectively. All are off Riverside Parkway in Tuscaloosa between the AL 69/US 82 and US 82 By-pass bridges. Locks 10 (mile 339.6, 10' lift) and 11 (mile 339.8, 8½' lift) are across from Queen City Park; both land walls are underwater but the stairs down to Lock 10 and the lockhouses at Lock 11 are still visible. Lock 12 (mile 340.6, 10½' lift) is in University Park opposite the N entrance to the University of Alabama; the land wall is above water, the only stone lock still visible on the river. UTM: 16.44900. 367680, Tuscaloosa GA. The first coal mined in Alabama was from this area, before the days of locks and dams.

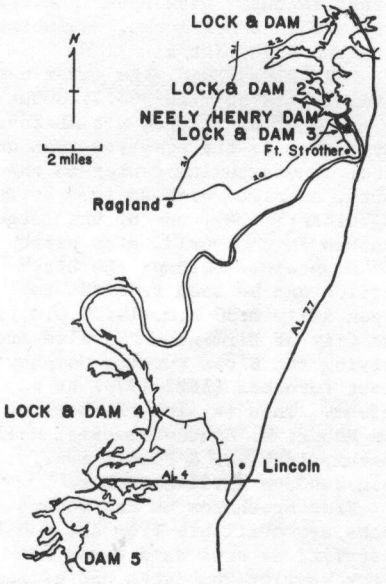
HOLT L&D (mile 347.0, 64' lift, L bank, 1966) is 6 mi. NE of Tuscaloosa via Holt, or county road 116 and Peterson; information center, no camping. LOCK & DAM 13 (mile 347.5, 13' lift, stone, 1905) was ½ mi. above it on the L bank but has been removed, as has LOCK & DAM 14 (mile 351.0, 14' lift, concrete, L bank, 1910). LOCK & DAM 15 (mile 357.8, 14' lift, R bank, 1910) is intact, 12' underwater at Howse Fishing Camp (picnicking, water) about 13 mi. NE of Tuscaloosa on county road 47, then R 2 mi. to the river. LOCK & DAM 16 (mile 364.0, 20' lift, L bank, 1915) still has its land wall visible 1 mi. downstream via a riverside road from the JOHN HOLLIS BANKHEAD L&D (mile 365.5, 69' lift, L bank, 1975), about 30 mi. W of Birmingham via county road 54; look for Corps sign after passing Oak Grove. The original 1915 2-lock staircase here (LOCK & DAM 17) provided a maximum 73' lift with two chambers 52x285½' and is still intact at the dam, on the L bank. The miter gates have been removed, a dam placed across the lock, and the lower chamber filled in. This interesting lock is not at present accessible, having been cut off by the channel down to the new lock. The Bankhead Lock has the largest lift on the navigation and has also had its troubles; two months after opening to traffic, the lower gates burst open while half full during a lockage, washing one of the lower gates 200 yards downstream - all 325 tons of it! The cause appears to have been a hang-up in the roller guide at the base of one of the lower gates, so the two failed to meet properly. To keep this from happening again, interlocks and other safety features have been installed here and in other locks, beginning with the high lifts.

PORT BIRMINGHAM, the major upper terminus, is at mile 396.4, about 20 mi. W of Birmingham via AL 269. Birmingham is the greatest iron and steel manufacturing center in the South, complete with an iron statue of Vulcan (1904), one of the largest statues in the world, atop nearby Red Mountain. Perhaps the Black Warrior can be seen from its top (open daily 8:30 a.m.-10:30 p.m.). The City of Birmingham is also preserving the Sloss Furnace Company's blast furnaces (1882-1970) as a museum. This is also the home of the Robert W. Kincey Memorial Rail Museum, 18th St. & Powell Ave., open Sundays April-November.

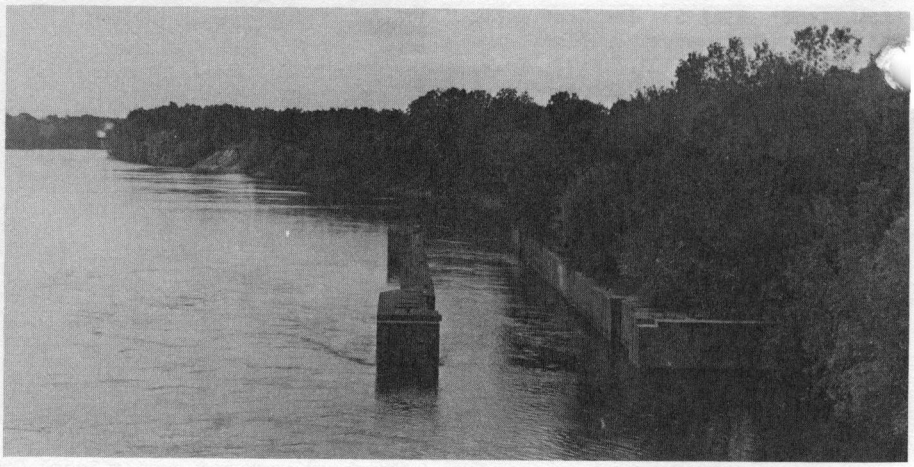
Free brochures on the modern locks are available from the Mobile District, as well as a bound book of Black Warrior-Tombigbee navigation charts, consisting of aerial photographs, at $2.

The ALABAMA RIVER, from its mouth to the Mobile River (45 mi. above Mobile) was navigable in early days up to Wetumpka, 11 mi. up the Coosa, a distance of 316 miles. In recent years 3 locks and dams have been constructed to create a 9-foot channel, with locks all 84 x 600' in the chamber. The CLAIBORNE LOCK AND DAM (Alabama River mile 72.5, 30' lift, 1969) is on the L bank, 6 mi. upstream of the US 84 bridge; overlook on W bank, via Gosport; overlook and lock on E bank, via Fountain. MILLER'S FERRY LOCK AND DAM (mile 133, 48' lift, 1969) is 1 mi. below the AL 28 bridge; overlook on E bank at the lock, via town of Miller's Ferry. JONES BLUFF LOCK AND DAM (mile 236.2, 45' lift, 1972) is 2 mi. upstream of US 80 and Benton; lock is via Edsons. There are no camping facilities at these locks but for elsewhere on the lakes see recreational facilities maps of the reservoirs available from the Mobile District, Box 2288, Mobile AL 36628. A bound book of Alabama River navigation charts, consisting of annotated aerial photographs from the Gulf to Wetumpka (clearly showing old Lock 31) is available from them at $2.

The COOSA RIVER begins at Rome, GA, and flows 284 miles into the Alabama River just above Montgomery, Alabama, the first capitol of the Confederacy. In the 1870's the Corps began a navigation project along this section involving some 30 locks and dams, but only 7 were begun, and of these 5 were completed, making the river navigable for 169 mi. from Rome down to the Southern RR crossing (at I-20) near Riverside. Locks 4 and 31 were 52 x 180' in the chamber; the earlier ones were



Old Locks on the Coosa below Gadsden



Old Lock 31, Never Completed, in Wetumpka, Alabama
(Billy G. Moore, Elmore County Public Relations)

40 x 176'. They operated through 1945; all were finally abandoned in 1950.

MAYO'S BAR LOCK AND DAM (mile 278.5, concrete, 12' lift, L bank, 1915) is intact and complete with steel gates, now a fine Floyd County park 5½ mi. below Rome on Ball's Bluff Road (see the Georgia section of the Guide). LOCK AND DAM 1 (mile 152.5, 5' lift, R bank, 1890) and 2 (mile 149.5, 5½' lift, R bank, 1890) are submerged in H. Neely Henry Lake, 4.7 and 1.3 mi. above the dam, respectively. LOCK AND DAM 3 (mile 148, 12' lift, R bank, 1890) is on the W bank, 1 mi. below Henry Dam on the road to Ft. Strother. This lock is intact and a prime site for an historic riverside park, if it can be bypassed by future navigation improvements.

LOCK AND DAM 4 (mile 127, 8' lift, L bank, 1914) and DAM 5 (mile 117, lock never begun) are in Logan Martin Lake, 27 and 17½ mi. above the dam, respectively. Lock 4 might be visible at low water and visited by boat.

LOCK 31 is all the way down the river at Wetumpka (mile 11) and was to have had a 15' lift. Because of the scarcity of stone in the area, concrete was used up to the low water mark and the rest was concrete faced with stone. Begun in 1891, it was complete except for gates, valves and operating equipment; the dam was never begun. This historic site now belongs to the city of Wetumpka and is used as a docking area but deserves more attention as an historic structure and park site. It is in Wetumpka, off Dozier St. on the W bank just below the AL 14 bridge over the Coosa. The site of Fort Toulouse (1717) is only 4 mi. downstream at mile 7; the state plans to restore it. Perhaps a steamboat could link it with Wetumpka and Montgomery.

There are now 7 high power dams on the Coosa: Bouldin, Jordan, Mitchell, Lay, Logan Martin, Henry and Weiss, all (except Jordan, which would be bypassed) designed to accomodate high locks if it is ever decided to make the Coosa navigable again. A single lock at Bouldin Dam would have a lift of 127', one of the highest in the world. Lock 31 at Wetumpka would not be endangered by such a navigation because this stretch of river is bypassed by a 5 mile canal from Bouldin Dam. Lock 3, however, is in the way of the proposed channel below the proposed lock in Henry Dam; we hope that some thought will be given to bypassing the old lock, leaving it as an historic riverside site to compare with the new high lock. Mayo's Bar Lock near Rome might have its river wall removed to clear the channel - again requiring some thought toward alternatives. UTM: Mayo's Bar Lock, 16.6606.37855, Livingstone, GA quad; Lock 31, 16.5743.36001, Wetumpka GA.

Maps of the lakes are available from the Alabama Power Co., P.O. Box 2641, Birmingham, AL 35291. See STEAMBOATS ON THE COOSA by Bert Neville (Selma AL, 1966).

For a summary of transportation development in Alabama see W.E. Martin's "Early History of Internal Improvements in Alabama" (Johns Hopkins Univ. Studies 20, No. 4, 1902) and RIVERS OF ALABAMA (Strode Publishers, Huntsville AL, 1968, $6.95). The Mobile District history, which covers the Alabama navigations, is being revised.

For the section on Alabama we are especially grateful for the help of Mr. John P. Jones of the Mobile District; Mr. Craig Battles of the Alabama Power Company; Mr. Billy G. Moore, Public Relations Director for Elmore County; and Marvin Harper of the Tuscaloosa County Preservation Society.