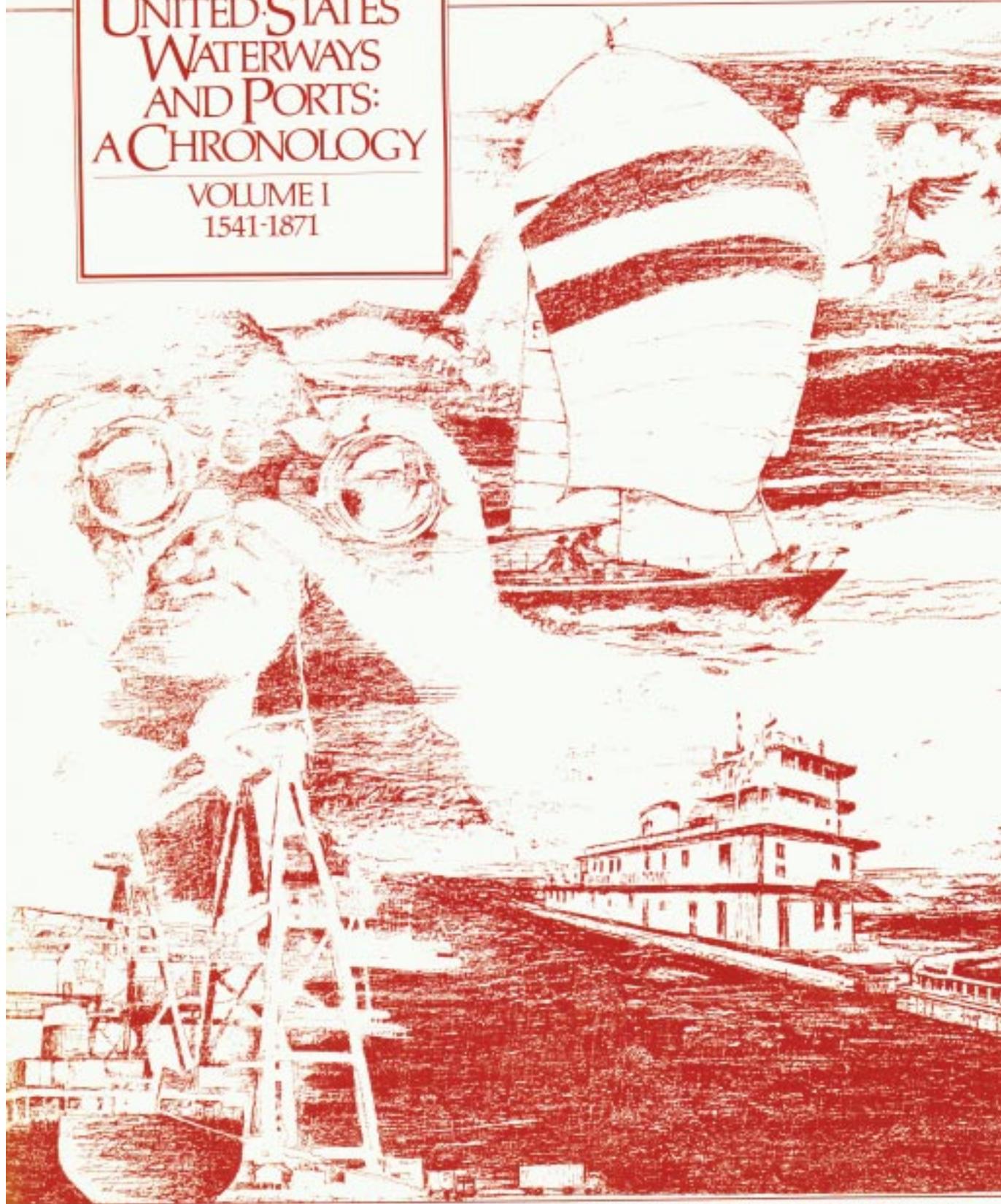


# THE UNITED STATES WATERWAYS AND PORTS: A CHRONOLOGY

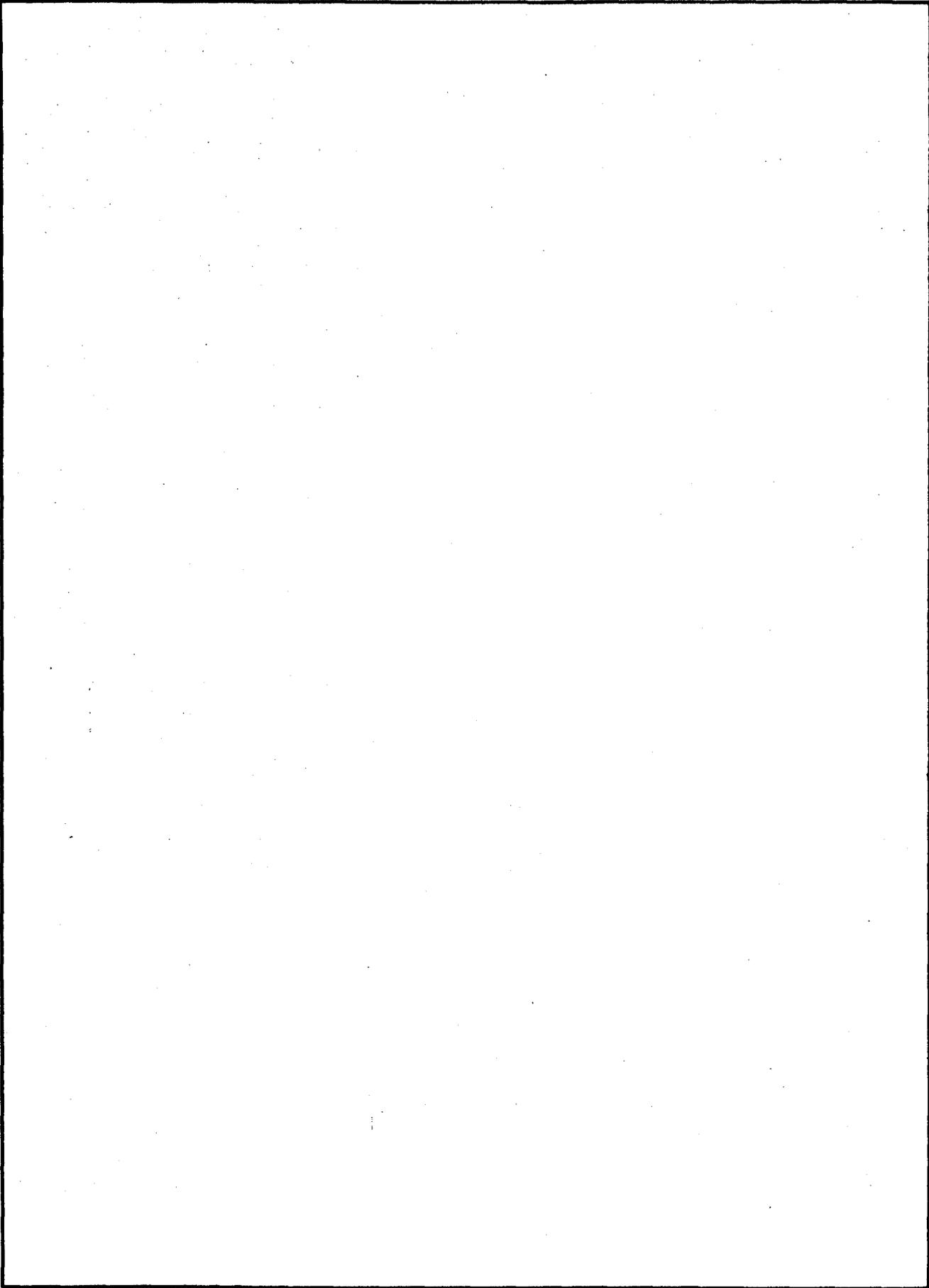
VOLUME I  
1541-1871



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THE  
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Robert W. Harrison

April 1980

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## NATIONAL WATERWAYS STUDY

### Staff Papers

In the course of the National Waterways Study, the staff of the Institute for Water Resources will prepare staff papers on a wide range of subjects related to the waterways, their development and use. These papers are being made available in preliminary form for purpose of review and discussion. They are not in their preliminary form official parts of the National Waterways Study reports.

Questions or review comments on this staff report should be addressed to Mrs. Arlene L. Dietz, National Waterways Study Manager, at (202) 325-7141 or to Mr. Robert W. Harrison, Senior Economist, at (202) 325-7420, Institute for Water Resources, Water Resources Support Center, U.S. Army Corps of Engineers, Kingman Building, Fort Belvoir, Virginia 22060.

## THE U.S. WATERWAYS AND PORTS: A CHRONOLOGY: VOLUME ONE

One of the earliest and most persistent themes of American history relates to the development, use and improvement of the natural waterways including the inland waterways, the Great Lakes, the coastwise trade routes and the harbors and ports. The period of active canal building, 1825-1850, is also an important part of waterways history. This is a progress which has taxed the skills and energy of each generation. The very earliest explorers of North America saw the value of linking the natural streams and lakes into a system that would promote exploration, settlement, and economic and social development. Congress through the National Waterways Study, now underway, seeks new dimensions in which the waterways and ports may serve transport needs of the United States. The location and character of U.S. waterways and the volume and pattern of transport movements in our economy are shown in the maps prepared for the National Waterways Study.

Volume One of the chronology highlights the early and dramatic history of waterway and port improvements in the American Colonies and in the early years of the United States. The story is carried through the era of canal building.

Many individuals and organizations have been involved in the development of the waterways, but none for a longer period or more consistently than the U.S. Army Corps of Engineers. As aids or guideposts to chronological thinking, events of a political, social, or scientific character are occasionally added to the chronology as navigation lights mark the bends of our great rivers and guide sailors to the safety of our seaports and harbors.

## 1. Use of Waterways in Early America

- 1541 - The Spanish Explorer, Hernando de Soto, discovered the Mississippi River and made the first record by a European of the Mississippi River in flood stage. The exact point of discovery is not known, but is believed to be in the alluvial valley below the present site of Memphis, Tennessee.
- 1607 - English colonists sailed up the James River and made the first permanent English settlement in America at Jamestown, Virginia, near present day Williamsburg.
- 1609 - The Hudson River is navigated by the Dutch; settled at New Amsterdam--called New York after 1664.
- 1673 - Louis Joliet leading the Joliet-Marquette Expedition to the Great Lakes and Upper Mississippi, discovered that Lake Michigan could be connected to the Mississippi River by building a short canal from the Chicago River to the Illinois River, a tributary of the Mississippi. More than a century and a half later, in 1836, the State of Illinois started the Illinois and Michigan Canal, following the general route suggested by the explorer. The canal was not completed until 1848.
- 1676 - Samuel Sewell recorded in his diary of October 26 that he examined a possible route for a canal from Buzzards Bay to Cape Cod Bay, which would almost cut in half the dangerous sea route to New Amsterdam. It was 1914 before this short cut was fully realized by building the Cape Cod Canal, a link in the Atlantic Intracoastal Waterway.
- 1678 - LaSalle set out on an expedition which made him famous as the first white man to descend the Mississippi throughout the greater part of its length to the Gulf of Mexico.
- 1699 - The French explorer d'Iberville entered the mouth of the Mississippi River and studied the river probably as far as the mouth of Red River. He explored the Gulf Coast thoroughly and established a colony in Biloxi Bay. In 1702 the headquarters of the colony was moved to Mobile Bay.
- 1705 - The first recorded cargo was floated down the Mississippi River containing 15,000 bear and deer hides.
- 1716 - Virginia Governor Alexander Spotswood entertained the idea of a water route to the Ohio River by either the James or Potomac River, but was not able to act on his concept.

- 1717 - Bienville sailed into the Mississippi River and established New Orleans on the first high ground, which was not high enough and a levee was required to protect the settlement from Mississippi River floods. Bienville's engineer, de la Tour built the levee and engineers have been busy here ever since.
- 1748 - The Ohio Company of Virginia, a trading company founded in 1748, developed trade routes from Atlantic tidewater to the Ohio River using the Potomac and Monongahela Rivers for much of the distance.
- 1753 - France sent armed forces into the Upper Ohio Valley to protest plans of the Ohio Company of Virginia, to penetrate the Ohio River Valley as far as the falls at Louisville. The French and Indian Wars (1754-1763) followed.
- 1768 - Lieutenant Thomas Hutchins of the Royal British Army was busy mapping the topography and hydrology of the Tennessee and Cumberland River Valleys, a task that led to a job later as "Geographer of the United States of America," and to work with the Topographical Engineers of the U.S. Army. The "long hunters" were already in the valley of the twin rivers, trading in buffalo tallow and hides.
- 1772 - George Washington, then a member of the Virginia House of Burgesses, secured passage of an act for opening the Potomac for navigation from tidewater to Fort Cumberland, Maryland. Under the act, money could be raised by subscription and lottery. Merchants of Baltimore opposed a similar act when it was up in the Maryland Assembly because they feared Georgetown and Alexandria would get the trade they wished to control.
- 1773 - Citizens of Richmond promoted improvements on the Potomac and the James, particularly the building of locks, to facilitate passage around the rapids at the fall line in these streams. Funds were raised in the colonies and in Great Britain and the promoters offered to furnish slave labor to get the work started.
- 1779 - Colonel John Donelson, led a flotilla of flatboats and canoes filled with women and children down the Tennessee River and up the Cumberland River to settle in middle Tennessee. Several lives were lost to Indians and to accidents of navigation. Muscle Shoals and the Suck where the Tennessee breaks through the mountains were impediments to navigation for a century or more.
- 1785 - Representatives of Maryland and Virginia met at Mount Vernon to settle their differences over the navigation of the Potomac River and Chesapeake Bay. The agreement they reached is known as the "Mount Vernon Compact" and had considerable influence on the management of resources held by two or more states jointly.

- 1789 - The Northwest Ordinance passed in the first session of the first U.S. Congress declared: "The navigable waters leading into the Mississippi and St. Lawrence and the carrying places between the same shall be common highways and forever free..."
- 1793 - John Hancock, Governor of Massachusetts, granted a charter to Middlesex Canal Company to build a canal connecting Boston Harbor with the Merrimac River, where there were important settlements. The company was given authority to sell stock and collect canal tolls. William Weston, an Englishman residing in Philadelphia, was engaged to design and build the canal which was completed in 1803. It served for 57 years until 1860, when it was sold to pay the debts of the canal company. The canal stockholders broke even.
- 1797 - Waterway improvement on the Great Lakes began in 1797 when the British "Northwest Fur Company" built the first lock and dam to carry boats around St. Mary's Falls between Lake Superior and Lake Huron to eliminate the portage.
- Palmyra, Tennessee, on the Cumberland River was designated by Congress as a port of entry--one of the first on the Trans-Appalachian frontier. Trade in tobacco was heavy. A tobacco inspection station was established at Clarksville, Tennessee, in 1789.
- 1798 - The first river gauge was placed on the Mississippi at Natchez by order of Governor Winthrop Sargent. Reading of this gauge continued to 1848.
- 1802 - The first congressional appropriations for waterways was made on April 6 providing \$30,000 for erecting and maintaining piers in the Delaware River.
- 1803 - President Jefferson concluded the purchase of Louisiana from France for \$15 million. The purchase extended from the Mississippi River to the Rocky Mountains and from the Gulf of Mexico to Canada.
- 1808 - Albert Gallatin, U.S. Secretary of the Treasury, submitted a report "Roads and Canals..." to the U.S. Senate. His report emphasized the importance of long range planning for resources and public services such as water and transportation. He saw the multipurpose value of the water resource, as well as the possibilities of an integration of transport modes such as roads and canals. He prepared a long list of road and canal projects to help link New England with the South and the seaboard states with the interior of the young nation. Gallatin's report stated clearly the Federal interest in water resources but this point was hotly debated. The projects he proposed were, for the most part, carried out over the

following 150 years. The Tennessee-Tombigbee Waterway, presently under construction, connecting the Tennessee River with Mobile, Alabama, on the Gulf of Mexico, was among his proposals for improving inland water navigation.

## 2. From the Invention of the Steamboat to the Civil War

- 1811 - The first steamboat, the New Orleans, built in Pittsburgh by Robert Fulton, navigated the Ohio and Mississippi Rivers. In 1816, Henry Shreve build a steamboat called the Washington, better suited to conditions of inland river navigation. It had a shallow draft, and carried the machinery on the first deck. The Washington made a roundtrip between Louisville, Kentucky, and New Orleans, Louisiana, in 41 days. The era of great steamboats on the inland rivers had begun.
- 1812 - Washington City was burned by the British.
- 1815 - President Madison urged the Congress to consider the need for a national seminary of learning and for roads and canals to be built under Federal authority.
- 1817 - The construction of the Erie Canal was started by New York State. Completed in 1825, it became the most successful of American canals. The first major water project of the United States, the Erie Canal was 363 miles long, joining the Hudson River with Lake Erie, it opened the west to the markets of the world through New York City. A great wave of canal building followed.
- 1820 - The Pennsylvania legislature authorized construction of the Pennsylvania Turnpike from Wrightsville on the Susquehanna to Pittsburgh.
  - Congress appropriated \$5,000 for surveys, maps, and charts of the Ohio and Mississippi Rivers with a view to their improvements for navigation. National attention was directed to navigation improvements on the Mississippi River as the number of steamboats was increasing rapidly on the Mississippi and its major tributaries.
- 1823 - The Corps of Engineers received its first legislative assignment for navigation improvements, involving examination and surveys of the harbor at Presque Isle on Lake Erie in Pennsylvania.
- 1824 - The Congress authorized President Madison to have surveys made "...of the routes of such roads and canals as he may deem of national importance from a military point of view," (known as the General Survey Act).

- The Act of May 24 initiated Federal improvements for navigation in the Ohio and Mississippi Rivers, appropriating \$75,000 for this work. This Act is generally considered as the true beginning of the Corps of Engineers role in developing the commercial waterways of the United States.
  - The Shaker Colony at South Union in Logan County, Kentucky, began shipment of produce down the Red River, a tributary of the Cumberland in 1824. This trade continued until 1842.
  - The Corps of Engineers designed and constructed a revolutionary snagboat using steam power to pull large water-soaked trees out of the Mississippi River channel. Two experimental suction dredges were also designed and built at the same time.
  - The first harbor improvements were undertaken by the Federal Government on Lake Michigan at Erie, Pennsylvania; Cleveland, Ohio, and other points. Work included breakwaters, jettys, piers and deepening of harbor entrance channels.
- 1825 - A 92-mile long "raft" of sunken logs and stumps which blocked the Red River in Louisiana was examined with the idea that it could be removed by blasting or other means.
- Colonel Stephen H. Long constructed a simple wing dam on the Ohio River near Henderson, Kentucky. This was the first work on the main stem of a western river for the purpose of improving the channel for navigation by confining the current in the river to a narrower portion of the river bed, thereby increasing the water velocity and the scouring away of bars and other obstructions through the action of the river itself. The experiment was successful and similar work was attempted in the following years on many rivers throughout the nation.
- 1826 - Work was started on the Pennsylvania Main Line Canal. The objective was to join Philadelphia with Pittsburgh by a water route. This proved impractical. A gap of about 26 miles in the mountain area was left to be covered by an incline railway which hauled the barges overland. The project was opened in 1834 at a cost of \$10,338,133, a record for the time. Charles Dickens provided the world with a colorful description of his travels by the Pennsylvania Main Line Canal.
- 1828 - Andrew Jackson was elected President of the United States.
- The Chesapeake and Ohio Canal was started. This project moved slowly and it was 1850 before it reached Cumberland, Maryland. The objective of reaching the Ohio was abandoned. However, it had a few years of considerable success as a carrier of coal in barges of up to 100 tons capacity. Unfortunately, the Great Flood of 1889 wrecked the C&O Canal

from beginning to end. Parts of it are today used for a recreation trip from Georgetown in the District of Columbia through the Maryland countryside.

- Louisville and Portland Canal was constructed, with Federal aid, around the Ohio River falls at Louisville, Kentucky. Ohio River navigation benefitted greatly from this work.
- Advertisements seeking contractors were placed in newspapers in New Castle and Philadelphia, Pennsylvania, for work on a breakwater and ice breaker in Delaware Bay.
- 1829 - The first survey of the Rock Island rapids in the Upper Mississippi was made in the interest of navigation by a Corps of Engineers officer.
- 1830 - Removal of snags in the main Mississippi River channel was completed.
  - The Army Engineers surveyed the harbor at Baltimore, Maryland. In 1836 Congress approved \$20,000 for deepening the entrance channels here.
- 1831 - A bold attempt was made to improve navigation at the mouth of the Red River where it enters the Mississippi by making a cut-off of Turnbull Bend. The work was proposed by Captain Shreve and was called Shreve's Cut-off. This work and a second cut-off made at Raccourci Bend in 1848 by the State of Louisiana caused great controversy among river engineers.
- 1832 - The first Congressional appropriation was made for improvement of the Cumberland River below Nashville in the amount of \$30,000 to be used for removal of a dense growth of brush and trees overhanging the channel, removal of snags and logs imbedded in the river, blasting of rocks and reefs, and improvement of the river by construction of wing dams to confine the channel. The Corps of Engineers carried out this work.
- 1836 - Work was started on the James River and Kanawha Canal. The objective was to join the James River to the Kanawha River which was finally done by railway. That part of the canal between Richmond and Lynchburg was quite successful. However, the flood of 1877 damaged the canal badly and it was soon sold to a local railroad.
- 1837 - Appropriations were made for improvement of the Cumberland River above Nashville. The Upper Cumberland navigation made possible development of important coal fields.

- The first Federal efforts were made to understand the passes and bars at the mouth of the Mississippi River and the needs of seagoing navigation. Deepening the bar by dredging with buckets was recommended by the Corps of Engineers and work was subsequently started.
- 1838 - The Corps undertook the first work on the Missouri River for navigation.
- 1840 - Steamboats on the Missouri reached Independence, the eastern terminus of the Sante Fe Trail. Here, goods moving west were transferred from steamboats to wagon trains.
- 1841 - Congress authorized the charting of 9,500 square miles of the Great Lakes system with an initial appropriation of \$15,000 to the Corps of Engineers to carry out the survey work.
- 1843 - Observations were made to determine the amount of sediment carried in suspension in the Mississippi River by Professor J. L. Riddell. Scientific interest in the Mississippi was growing.
- 1845 - A convention was held at Memphis, Tennessee, to promote river improvements for navigation. John C. Calhoun presided and strongly advanced the viewpoint that flood control and navigation were both national problems, transcending the merely local, and worthy of Federal interest. Similar conventions were held later at Chicago and Cincinnati.
- 1846 - The possibility of a ship channel to serve Houston, Texas, was first suggested by local groups.
- 1849 - The California Gold Rush of 1849 brought increased traffic to the California harbors.
- 1850 - After 1850, improvements of waterways in the U.S. were carried out essentially as a Federal activity. Federal appropriations for river and harbor work totaled approximately \$13 million for the years 1787 through 1850.
- The Secretary of War directed Charles Ellet, Jr., of the Corps of Engineers, to make surveys and report on the Mississippi and Ohio Rivers with a view to preparation of adequate plans for flood prevention and navigation. Ellet made the following recommendations: (1) prevent cut-offs; (2) enlarge natural outlet through Bayou Plaquemine and Atchafalaya Rivers; (3) create an artificial outlet through Lake Borgne; (4) improve the levee system particularly below the mouth of the Red River; and (5) construct a system of reservoirs on the Upper Mississippi and on its principal tributaries to hold floodwaters.

- 1851 - Work was begun on the "Delta Survey" by Captain Humphreys and Lieutenant Abbot, Corps of Engineers. Their work "Report Upon the Physics and Hydraulics of the Mississippi River, Upon the Protection of the Alluvial Region Against Overflow and Upon the Deepening of the Mouths, etc..." had a profound effect on the Federal program over the next 50 years.
- Ocean shipping hampered by lack of draft over the bars at the mouth of the Mississippi River.
  - Water transport on the Colorado River was begun in 1851 to supply the military post at Yuma, Arizona.
- 1852 - Federal harbor improvement work on the Pacific Coast begun at San Diego, California. An embankment was built across the mouth of the San Diego River in an effort to change its course.
- The first direct appropriation was made for improvement of the navigation of the Tennessee in the amount of \$50,000.
- 1856 - Congress appropriated \$330,000 to open and maintain by contract ship channels through the bars at the mouth of Southwest Pass and Pass a l'Outre of the Mississippi River. A depth of 20 feet and width of 300 feet was sought. A jetty about a mile long made of sheet piling failed to deepen the river adequately and the contractor gave up. Corps of Engineers forces continued the work and succeeded in obtaining a depth over the bars of 18 feet.
- 1861 - Civil War. Navigation improvements fell into disrepair on the Lower Mississippi. At the end of the war, the costs of essential repairs to the levee of the Mississippi River were estimated at about \$3,900,000.
- 1867 - Dredging resumed at the mouth of the Mississippi River. The dredge Essayons worked in Pass a l'Outre and the dredge McAlister was in Southwest Pass. Both were equipped with large scrapers but not much progress was reported.
- The Corps began the investigation of Mississippi River headwater reservoirs to provide for river navigation at low water stages. It was 1880 before a project of headwaters reservoirs was begun.

### 3. The Great Era of American Canal Building: 1825-1850

In the first section of this chronology of the American waterways, the small-scale canals constructed during the colonial period were recognized as important beginnings toward a system of water transportation which utilized natural streams and connected them by canals when feasible. But there was little capital in the colonies and the start toward improving the waterways was slow. By 1800, less than 20 canal projects had been successfully completed. The combined length of these was probably not over 100 miles. The Middlesex Canal in Massachusetts and the Santee and Cooper Canal in South Carolina were probably the most important canals then in use. The Middlesex allowed the merchants of Boston to trade with the Merrimack Valley and the Santee and Cooper did the same for the merchants of Charleston in their desire to penetrate the important markets along the Santee River system.

The value of canals as practical means of transportation quickly gained recognition. There was soon a widespread belief that a well planned canal could bring prosperity to economically stagnant communities. The opening of the Erie Canal in 1825 demonstrated the marked effect improved transport could have and marks the beginning of the "canal era" in American transportation. By 1850 over 4,000 miles of navigation canals had been built at a cost of over \$300 million. The first canals were built by stock companies. After New York State took responsibility for construction and operation of the Erie, canal building on a large scale became the responsibility of the individual states, with only limited Federal assistance in the forms of loans or grants of land. Only a handful of stock companies remained in the active canal building business once the state governments became strong participants. After 1850, the railroads took the lead in transportation planning. The states frequently sold the canals they had struggled to build to the rapidly expanding railroad companies. The era of canal building ended in an atmosphere of defeat and in some cases of bankruptcy for the states, although several of the economically successful canals, particularly those forwarding coal to the eastern seaboard cities, remained active well into the 20th Century. With few exceptions, the railroads quickly closed the canals they purchased.

1824 - From 1824 to 1834, the canal building in America almost reached the proportions of a mania. During this period the Delaware River contributed water to more successful canal projects than any other stream. Canals using Delaware River water included the Schuylkill Navigation, the Delaware and Hudson Canal, the Delaware and Raritan, the Lehigh Valley Canal and the Morris Canal.

- Construction was begun on the Morris Canal which led from Upper New York Bay to the Delaware River at Phillipsburg; extended later to Jersey City and to New York Bay. Nothing was standard size on this canal. The locks were so small that they could

not handle boats carrying more than 25 tons, although traffic was forwarded from the Lehigh and other canals connecting with the Delaware. Twenty-three inclined planes were required to get the Morris Canal boats up and down from Lake Hopatcong, 1600 feet in 90 miles. Fortunately, these were well designed and worked effectively. Despite all the limitations of the Morris Canal as originally built, it did an enormous business in coal movement and was profitable.

- 1825 - Work was begun on the Lehigh Canal at Mauch Chunk, Pennsylvania, in April. This canal was 85 miles long, extending up the Lehigh River from Easton to Mauch Chunk and later extended to Stoddartsville. The Lehigh was well built; its management overcame many difficulties. Some of the worse were caused by floods.
- The Delaware and Hudson Canal Company sold all of its stock subscription in one day, January 7, 1825. The 108 miles of canal from the Hudson River to Honesdale, Pennsylvania, was completed in the fall of 1828, but there was still a large aqueduct to be built across the Delaware River and there was some question as to whether a canal could be built all the way to the anthracite deposits the canal company hoped to exploit through shipment to seaboard markets. After study, inclined planes were developed to bring the coal to the canal head and the great engineer, John A. Roebling, built a suspension aqueduct across the Delaware to carry the coal barges. The Delaware and Hudson Canal became one of the wealthiest in the nation, largely by moving Lackawanna coal to the wharves of Manhattan. It reached its peak in 1872 when it carried about 3 million tons of coal.
  - Ground breakings were held on the 4th of July and 5th of July for Ohio's two greatest canal ventures: the Ohio and Lake Erie Canal which joined Lake Erie at Cleveland with the Ohio River at Portsmouth, and the Miami and Erie Canal which in its first phase linked Cincinnati, on the Ohio, to Dayton. Later the Miami and Erie Canal was carried north to Toledo and to the junction with the Wabash and Erie Canal, the principal canal project of the State of Indiana. DeWitt Clinton of New York was principal speaker at both the Ohio ceremonies in recognition of the importance of the New York Erie Canal to the two Ohio canal projects. Ohio farmers and merchants hoped to gain some of the rewards of the eastern market which New York State was receiving in such abundance through full utilization of the Erie Canal.
- 1828 - In October 1828, the Delaware and Hudson Canal Company opened 108 miles of canal from the Hudson River to Honesdale, Pennsylvania, on the Delaware having 107 locks, 22 aqueducts, 100 bridges.

- Congress made a grant to Ohio of 500,000 acres to help the State carry out its canal building program. Other Federal land grants followed, eventually totalling 1,230,000 acres to Ohio.
- 1829 - The Miami and Erie Canal was opened from Cincinnati to Dayton. There was heavy use of this canal from the start, greatly to the economic advantage of Cincinnati, Ohio. The demand was strong for its extension to Lake Erie but the State of Ohio was having difficulties finding the funds to complete the Ohio and Erie Canal, its greatest canal project.
- 1830 - Railroad track in the United States totalled 23 miles. By 1840 it had risen to about 3,000 miles, but in many communities the steam engine was still looked on as an agent of the devil. On many lines trains did not run on Sundays.
  - Work was begun on the Delaware and Raritan Canal with Canvass White from the "Erie School of Canal Engineering", as chief engineer. This was probably the best planned canal in America. It ran from the estuary of the Raritan River at New Brunswick to Bordentown on the Hudson. This was a large canal, 80 feet wide and 8 feet deep. Its use was great from the start and in a few years it was enlarged. The Delaware and Raritan Canal captured much of the freight carried by wagon companies operating between Philadelphia and New York since early colonial times.
- 1832 - On December 1, the Ohio and Erie Canal was completed as the lock gates at Portsmouth, Ohio, were opened and the first flotilla of boats passed into the Ohio River from Lake Erie. The canal had cost the state \$7,904,000, about twice the original estimates. Engineers with experience on the Erie Canal, notably David Bates, built the Ohio and Erie Canal and it worked well. Bates built feeders on the Portage Summit which proved essential, but added considerably to the expense of the canal. Earnings on the Ohio and Erie were good and in a few years tolls exceeded \$100,000 annually, reaching a peak in 1851 when over \$430,000 was collected.
- 1833 - Work was begun on the extension of the Miami and Erie Canal to Toledo on Lake Erie. This extension cost over \$8 million.
- 1834 - The Pennsylvania Main Line Canal was officially opened. The Main Line Canal joined Columbia on the Susquehanna with Pittsburgh at the head of the Ohio River. It was one of the longest canals. The cost to the state was about \$10 million. In the higher mountains, a portage railroad 37 miles long carried the barges over the higher peaks.

- A railroad powered by horses was built from Philadelphia to Columbia where passengers entered packet boats for the journey over the Main Line Canal to Pittsburgh. By use of the first class packet boats the Philadelphia to Pittsburgh trip was frequently made in 6 days. Immigrants moving west to take up land went by slower and cheaper boats. Passenger traffic exceeded all expectations in volume and in revenue production.
- 1835 - The James River and Kanawha Canal Company was organized and made an aggressive start. In 1836 over 1,400 slaves were busy digging on this canal. By 1837 the number had been increased to 3,000, housed in tents. That part of the canal from Richmond to Lynchburg was opened in 1840. The first boat through the canal was the William Henry Harrison.
- 1840 - By 1840 the Union Canal connecting the Schuylkill with the Delaware River represented an investment of \$6 million. Pennsylvania anthracite coal was the principal commodity moved.
  - The Morris Canal Company completed enlargements to the canal, and to locks and inclined planes in order to move the great volume of coal in demand at New York. The Morris had no passenger traffic and wanted none.
- 1844 - Although the railroads were expanding into the coal moving business, the canals held their own. The Delaware and Raritan, the Delaware Division of the Pennsylvania system, and the Lehigh system were interconnected. All required enlargements so great was the need to move anthracite coal. The Schuylkill Navigation also shared in this prosperity.
- 1845 - The Miami and Erie Canal was completed to Lake Erie. The improvement of the Grand Reservoir, a natural lake required to feed the canal, delayed the project for several years. Exclusive of 25 miles of feeder canal, the Miami and Erie was 248 miles long. Once in operation, the Miami and Erie provided profitable and a durable competitor with railroads which paralleled its route. Packet service on the Miami was equal to that on New York's Erie. The passenger boats were of high quality, even luxurious. Speed was kept up.
- 1847 - By 1850, the Chesapeake and Delaware Canal was moving half a million tons of coal annually in barges. By 1870 the gross tonnage rose above one million tons. In 1919 the United States bought the canal and made it into a ship canal.
- 1850 - The Chesapeake and Ohio Canal finally reached Cumberland, Maryland. The Baltimore and Ohio Railroad had already arrived.

- 1855-60 By 1860 annual shipments on the Morris Canal reached over 700,000 tons, mostly anthracite coal, but also malable pig iron from the new furnaces in northern New Jersey.
- 1857 - Railroad competition begins to hurt the canals. By canal it took 4 days to move coal from the Delaware River to tidewater at Jersey City. By rail it took 5 hours. The Morris and Essex Railroad, the Lehigh Valley Railroad, the New York and Erie, Central Railroad of New Jersey, and the Delaware and Lackawanna Railroad were all seeking the lucrative coal trade.
- The Pennsylvania Railroad bought the Pennsylvania Main Line Canal and turned it into a carrier of slow freight. The railroad paralleled the canal for much of its distance.
- 1860 - The Lehigh Canal had a peak year, moving 1,338,875 tons of anthracite coal. The Lehigh was a long-lived canal. Mules moved along its towpath well into the 20th Century. Toward the end of its life, it got a temporary reprieve by the increased traffic in waste coal dredged from the bed of the Lehigh River.
- Tolls of the Chesapeake and Ohio Canal topped \$1 million, made largely from moving large volumes of coal. Bigger and bigger boats--up to 100 tons--became the rule. A line of fast packet boats was also established from Hagerstown to Georgetown. The C&O started downhill economically in the late 1870's.
- 1869 - The Schuylkill Navigation was leased to the Reading Railroad for 999 years.
- 1871 - The Morris Canal was leased to the Lehigh Valley Railroad for 999 years. This arrangement lasted to 1903, when the railroad got the state of New Jersey to take over the canal which was not longer profitable and needed repairs. The state operated the Morris at a loss for many years, finally abandoning it in 1924, cutting the banks and draining the canal. The stone viaduct over the Passaic River at Little Falls was blown down with dynamite.
- 1878 - The James River and Kanawha Canals were sold to the Richmond and Allegheny Railroad after being severely damaged by the flood of 1877.
- 1924 - The Chesapeake and Ohio Canal was purchased by the Western Maryland Railroad.

#### 4. End of the Canal Building Era

The economic panic of 1837 brought many canal building projects to a standstill. The frontier states suffered most. Indiana and Illinois had invested heavily in canal and railroad projects; they were almost bankrupt after 1837, a condition which only improved gradually over the next decade. The great hopes of the canal building era died out quickly. When prosperity returned, the railroads took over.

Two major projects on the frontier illustrated the diverse fate of American waterways of the 19th Century. Indiana entered the union in 1816 and planned to attract settlers to its thinly populated domain by a program of canal building. After a number of false starts, agreement was reached with Ohio for joining the Wabash River with the Maumee as the first step toward a great canal which would link Lake Erie at Toledo with the Ohio by way of Fort Wayne, Lafayette, Terre Haute, and Evansville on the Ohio River. Called the Wabash and Erie Canal, this canal was joined by Ohio's Miami and Erie Canal, making for a connection with many Ohio towns, including Cincinnati. As outlined below, this canal came to a quite dismal end.

The same year that Indiana started work on the Wabash and Erie, Illinois undertook to join Lake Michigan with the Mississippi River by digging a canal connecting the Chicago and Illinois Rivers, a major tributary of the Mississippi. Joliet had envisioned such a connection in the 17th Century and Gallatin endorsed the concept in his report of 1808. The Illinois and Michigan Canal proved to be an expensive undertaking for the new state of Illinois. A lake-level canal was planned with six locks, but economic conditions delayed work and after the panic, plans were drawn for a cheaper, summit-level canal. It was 12 years before the Illinois and Michigan Canal was completed. Its first six years were very successful, but it became a drain for the waste of Chicago and declined as a transport route for both passengers and freight. In the early 1870's the canal was deepened to carry off sewage more effectively. The enlargement was only useful temporarily, and in 1882 work was begun on a new canal to serve a dual purpose--navigation and drainage--of the Chicago area. This work was finished in 1900 and called the Chicago Drainage Canal. The Illinois waterway today follows this route.

- 1836 - The first 32 miles of the Wabash and Erie Canal was opened from Fort Wayne, Indiana to Largo, Indiana.
- On the 4th of July, ground was broken on the Illinois and Michigan Canal. This canal, connecting Lake Michigan with the Mississippi River, ultimately proved to be one of the most important links in the national waterways of the United States.
- 1837 - The economic panic of 1837 delayed canal work on the frontier.

- 1841 - The Wabash and Erie Canal was opened from Fort Wayne to Lafayette, Indiana. Although there were only limited markets, farmers for miles around brought produce and grain to ship. Passenger boats soon appeared.
- 1842 - The Wabash and Erie Canal was opened from Toledo, Ohio, to Lafayette, Indiana, 240 miles. The event was hailed as the beginning of economic recovery.
- 1848 - The Illinois and Michigan Canal was completed. The first six years were prosperous. Freight and passenger traffic were heavy. In 1854, with the opening of the Rock Island Railroad, the packet boats went out of business. Some of the freight was also lost to the railroads, but for 20 years the canal was prosperous and had a tremendous impact on the State.
- 1849 - The Wabash and Erie Canal reached Terre Haute, Indiana.
- 1856 - The Wabash and Erie Canal reached Evansville on the Ohio River, completing the 458 miles from Toledo, Ohio. The Wabash and Erie held the record for length among American canals.
- 1860 - The Wabash and Erie remained opened for its whole length only four years. In 1860, the canal below Terre Haute was closed. It did not pay its way. Tolls decreased soon on other segments due largely to competition from the Chicago, New Albany and Louisville Railroad.
- 1871 - The idea of using the Illinois and Michigan Canal as a cheap way of disposing of Chicago's sewage was proposed. Canal historian Drago says: "Work began at once and by 1871, at an expense of \$3,000,000, the canal had been reduced to the lake level and Lake Michigan water was sweeping away from Chicago and down upon the countryside of the Illinois River Valley an endless stream of sludge, garbage, animal and human excrement, befouling the air and turning the once, clear and placid canal into a poisonous latrine. To hurry the scum along, the big pumping station at the summit level had been reactivated. The wonder was that boats continued to ply the canal. Tolls were lowered but business declined.

...That deepening the old canal was not going to solve growing Chicago's drainage problems became obvious within a few years. By 1881 the channel had collected so much filth from the city's sewage that it had become putrid, giving off a stench that was intolerable to anyone within miles of it. Something had to be done. To meet a situation that was becoming desperate, the Commission took some basic steps. To assure the city clean water it moved the intake cribs a mile further out into Lake Michigan and at the same time began dredging a new channel from the mouth of the Chicago River to

the Illinois, and down that river to its confluence with the Mississippi at Grafton, deep and wide enough to permit the passage of steamboats.

This, of course, was to become the dual purpose--navigation and sanitary--Chicago drainage canal."<sup>1</sup>

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<sup>1</sup> Drago, Harry Sinclair, Canal Days in America, New York, 1972, p 266.

