[Editor's Note: Dr. Thurston's article is the first of a series on the development of Florida's canals, rivers, and harbors, and the effect they had on the state's economy, ecology, and geography.]

Despite the time worn cliche, war does indeed solve some problems. The American Civil War settled with brutal and traumatic finality the future of chattel slavery in the United States, and resolved certain questions as to the nature of the federal union. In so doing, it also resolved a long standing controversy regarding the role of the central government in the development of internal improvements. Throughout the first half of the nineteenth century, the federal authority and responsibility in this area had been a subject of contention—even, at times, a major political issue. But the war itself had demonstrated the importance of an integrated transportation network. The power of Congress to act on behalf of the people was accepted, as Congressman Thomas D. Eliot of Massachusetts expressed it, in opening debate on the first post-war river and harbor bill on March 30, 1866, as “a matter of common sense.”

Most of Eliot's colleagues agreed and, stimulated by a growing demand from the folks back home, readily acknowledged their authority and responsibility. Popular pressure for federal improvements tended to concentrate on river and harbor development projects. Despite the rapid and revolutionary developments in overland transportation, waterways were still vital commercial routes and, in some areas, offered a necessary alternative to the emerging threat of railroad monopoly. Because they were not private property, however, waterways were not susceptible to improvement by private interests.
Eager to act on a popular mandate, Eliot and his fellow lawmakers were faced with two fundamental questions: to what extent should the federal government become directly involved in actual construction of internal improvements, and how should the necessary federal funds be distributed to the different parts of the country? It took four years to resolve these questions—four years of increasing survey authorizations, growing budget requests and expanding, if irregular, appropriations for project work—four years, too, of increasingly pointed neglect of the ex-Confederate states which prompted Senator Willard Warner of Alabama to lament that while proponents of improvements had scrutinized everything from Maine to Minnesota, “they never cast their eyes southward.”

By 1870, however, Congress had determined its course. Federal activity, it had decided, would be extensive enough to placate the public demand and it would be distributed from the pork barrel or, as John Farnesworth of Illinois put it, by the “‘tickle me Billy, and I’ll tickle you’” system. Furthermore, a number of carpet-bagger senators had successfully demonstrated the needs of the southern states and, with the help of sympathetic northern colleagues, had secured a share of the tickling. Thomas Osborne of Florida was certainly tickled. He brought home an appropriation of $15,000 for work on the St. Johns sandbar and an authorization for initial surveys of the Apalachicola River system. It was not very much, to be sure, but it was three times what he had hoped for.

It was not until 1878, however, that the federal government embarked on a large scale, comprehensive program of river and harbor improvements, a nationwide effort that would continue into the twentieth century. In this effort, too, Florida would receive its share of attention and expenditure.

**Natural Hazards**

As transportation routes, Florida's waterways suffered from certain natural shortcomings that had been troublesome since the days of Narvaez and DeSoto. Most serious was the peculiar mismatch of navigable rivers and natural harbors. The Apalachicola, Suwannee, and St. Johns rivers offered good navigable water routes through productive countryside, but their outlets to the sea were obstructed by extensive sandbars and oyster reefs. The sandbar at the mouth of the St. Johns River was particularly notorious as a hazard to navigation. The Suwannee River could be approached from the Gulf only by a tortuous passage through the oyster reefs from Cedar Key which was, itself, a difficult harbor to enter. Shallow approaches also hampered ships entering St. Marks and Apalachicola. Pensacola and Fernandina, on the other hand, provided deep, sheltered harbors, but their water connections with the interior offered limited potential for commercial development. Tampa faced the dual problems of shallow approaches through Tampa Bay and the lack of deep river access to the interior. St. Andrews Bay and St. Joseph Bay, both good harbors, had no river connection at all with the hinterland. These problems were compounded throughout the nineteenth century by the steady increase in the size of both river and ocean going vessels as a result of technological advances in design and construction.

Efforts to improve Florida’s waterways before the Civil War had been sporadic and largely ineffectual. The major problem areas got some attention, but there were no continuing projects even on the Apalachicola and St. Johns rivers where commercial traffic was considerable. The war itself ruined Florida economically. Plantations were abandoned, industries died, towns were depopulated. Roads fell into disrepair, railroad equipment and property deteriorated, and river navigation was virtually halted. Soil eroded from unattended farmlands silted river and harbor channels. Slash from old logging operations and debris from storms remained uncleared. Thus, the conditions encountered by vessels attempting to use these waterways in the immediate post-war period were sometimes worse than primitive.

To meet the most pressing navigation needs, the funds appropriated in 1870 were used to dredge a channel through the St. Johns bar. But efforts to maintain the channel during the following decade were barely sufficient to keep traffic moving into and out of the river. A permanent channel was impossible to attain as the sandbar shifted with every tide and major storms changed the configuration of the shoals completely. Hedging its bets, the government occasionally made additional expenditures for surveys and construction on the so-called “Nassau Passage,” a system of smaller streams connecting the lower St. Johns River with Fernandina, but with no better success.

In the meantime, Jacksonville was emerging as the center of commercial activity in East Florida. Regular steamer service with northern
ports was reestablished, as was the riverboat service to Palatka and Lake Monroe. The lumber industry and tourist business alone produced a measure of prosperity and growth. One guidebook of 1875 described Jacksonville as having "the most progressive business community of any town of its size in the south," and noted further that the great lumber trade employed an "immense [sic] number of vessels," which, with "innumerable steamers" plying the river, gave the town "a most animated and agreeable appearance."

Yet there was an air of hesitancy. Erastus Hill, writing from Jacksonville in 1877, was impressed with the progress and prosperity of the city, but he concluded, paradoxically, "I think there is more idleness to the square yard than any place I ever saw. No one seems to have anything to do but kill time." Lumber and tourists were not in themselves enough. Jacksonville needed convenient access to the sea in order to exploit the commercial value of these natural and human resources, and access to the sea required an adequate and dependable channel through the bar.

**Million Dollar Jetties**

In 1878 General Quincy Gillmore, U.S. Army Engineers, conducted an extensive survey of the mouth of the St. Johns River and a year later he proposed a major engineering project designed to meet the need. Gillmore's plan was both simple and ambitious. It called for the construction of rock jetties extending seaward from the shore on each side of the mouth of the river, eventually to reach nearly two miles in length. The jetties would accomplish two things. First, they would divert the movement of shifting sands away from the river mouth and into deeper water, preventing the buildup of obstructing shoals. Second, they would constrict the flow of water from the river so that the force of its current, combined with that of the ebb tides, would create and keep clear its own deep water channel between the jetties. It was anticipated that a channel depth of fifteen feet could be obtained in this way. Completion of the project would require several years, and its cost was estimated at $1,306,409.00.

Gillmore's plan was officially adopted in 1880 and work on the Nassau Passage was discontinued. This was a fateful decision. If the plan succeeded, Jacksonville, rather than Fernandina, was sure to become the primary maritime outlet for East Florida commerce.

Construction of the jetties was soon begun and progressed steadily despite a number of problems. Specifications called for a mattress of logs and brush about two feet thick to be laid on the sea bottom. Layers of rock would then be added, tapering inward toward the top, which was approximately at the surface of the water at low tide. The width of the jetties varied with the depth of the water and the strength of the currents working against it.

In some places the log mattresses proved too stiff to follow the contours of the sea bottom, allowing currents to undercut the base, resulting in excessive settling of the rock. In shallow water teredos attacked the wood, literally eating out the mattress, with similar results. Much of the rock used in the early construction was too porous and too light to withstand the forces of waves and currents generated by storms and tides. To meet

The steamer Levi H. Pelton plied the waters of the St. Johns River at the turn of the century. It made daily trips from Jacksonville.
these problems, the engineers varied the arrangement of logs and brush in fitting the mattress to the sea bed. They discouraged the teredos by treating the materials laid in shallow waters with chemicals, and they brought in heavier stone from quarries at Archer and Arredondo in Alachua County. With these problems solved, the final touch was left to nature. Completed sections of the jetties were soon covered by layers of shellfish which bound the surface in a durable cement.

With easier and more dependable access to the sea, Jacksonville became a scheduled stop for steamers operating between New York and the Gulf coast ports. Regular traffic between Savannah, Jacksonville, and Palatka flourished. Upriver service increased, with three established lines running steamboats between Jacksonville and the towns of Sanford and Enterprise on Lake Monroe. Other boats were operated independently, some as far upriver as Salt Lake opposite Titusville.

This traffic created a demand for additional improvements on the river itself. The worst trouble spot was the Volusia bar, where the river entered Lake Orange. A miniature version of Gillmore's jetty system was approved by Congress in 1880 and resulted in a permanent improvement. Two jetties approximately one-half mile in length were constructed of wooden pilings faced with planks. By 1887 the river current, thus confined, had scoured a five foot channel through the bar, which was later maintained by occasional dredging. Other work on the river included the dredging of shoal spots between Jacksonville and the mouth of the river, carried out by Duval County at a cost of over three hundred thousand dollars, and minor improvements in the channel between Lake George and Lake Monroe.

Despite the increasing competition of expanding railroads, traffic on the St. Johns River remained heavy. The size of vessels entering the river continued to increase, and with it, the need for deeper channels. In 1896 new improvement projects were approved, one to provide a channel twenty-four feet deep from Jacksonville to the sea, estimated to cost $2,109,750, and another to obtain a thirteen foot channel from Jacksonville to Palatka at a cost of $95,000. The era of commercial navigation on the St. Johns River was far from over, and Jacksonville's future as a seaport was assured.

Gulf Coast Declines

The rise of Jacksonville on the Atlantic coast was offset by the failure of Apalachicola to regain its pre-war eminence as a Gulf coast seaport. Commercial activity there had been brought to a complete standstill early in the Civil War by the Union blockade on the one hand and by Confederate obstruction of the river to prevent its use by Federal forces on the other. River commerce resumed briskly in 1865, moving the cotton that had accumulated in upriver warehouses during the war years. But this surge was followed by a sharp decline, and by 1870 it was obvious that extensive improvements of both the harbor entrance through Apalachicola Bay and the entire Apalachicola-Chattahoochee-Flint river system was necessary if a profitable commerce was to revive.

Surveys of the entire waterway were conducted in 1871 and 1872 and the following general picture emerged. At Apalachicola the channel approaches to the town had filled to such an extent that seagoing vessels were forced to anchor several miles off in the bay, where they were loaded from rafts and lighters. On the Apalachicola River a major blockage was found at Virginia Bend, some fifty miles upstream, where an accumulation of logs and debris had collected around the old Confederate obstruction. This had forced the river into a new course, known as Moccasin Slough, which was deep enough for river boats, but very narrow and crooked. A number of gravel and limestone shoals hampered navigation of the Chattahoochee River between Eufala, Alabama, and Columbus, Georgia at low water stages; several rock fingers below Eufala were considered extremely dangerous. On the Flint River the worst obstructions were found between Bainbridge and Albany, Georgia. An overhanging rock at Viola Bend had snared two steamers, one of which gave the bend its name. Snags, logs, and overhanging trees were a common hazard on all the rivers, especially after the annual spring freshets.

Separate improvement projects were adopted for each of the three rivers in 1873 and 1874. Later projects were adopted to open navigation on the Chipola River and to clear a channel useable at high water stages from Albany to Montezuma, far up the Flint River. The steamer Clara Dunning was purchased and converted for use as a snag boat by the Army Engineers and work began in
1875. By 1883 the Apalachicola River project was completed, including opening of the Chipola River channel, at a total cost of $35,177.03, and work was progressing well on the Chattahoochee and lower Flint rivers.

In the meantime, however, the condition of Apalachicola Harbor had steadily grown worse. New surveys carried out in 1878 and 1879 led to adoption of a proposal to dredge an eleven foot channel to permit seagoing vessels to reach the docks of the town. By 1883 a nine and one-half foot channel had been opened, but the annual appropriations for the work were never large enough to allow making a complete cut through the bar at one time and the project was not successful. By 1891, $107,000.00 had been spent, but seagoing vessels still could not get near the docks.

Undaunted, the intrepid Engineers resurveyed the bay in 1897 to determine the best location for an eighteen foot channel. Major R.A. Mahan recommended a route through West Pass, estimated to cost $350,000.00 and require an additional $20,000.00 in yearly maintenance. The increased trade and the savings in lightering fees would, he suggested, justified the expense. But Colonel Peter C. Hines forwarded the recommendation with "grave doubts," and the plan was not adopted. The end of the century was also the end of Apalachicola as an important seaport.

Improvement projects on both the St. Johns and the Apalachicola rivers were designed to provide integrated routes for waterborne commerce, connecting navigable rivers with outlets to the sea. They involved both river and harbor development. The success in opening the channel through the bar at the mouth of the St. Johns assured the continued value of the river itself. Conversely, the failure to develop a deep water harbor at Apalachicola impaired the usefulness of the whole river system as a commercial route.

**Down on the Suwannee River**

A similar pattern of traffic developed on the Suwannee River. Before the Civil War supplies and mail were brought to settlers along the river, and their agricultural products were delivered to Cedar Key by riverboats operating as far upstream as Columbus where the railroad from Jacksonville to Tallahassee crossed. This service was resumed in 1872, but only to New Troy, near present day Branford. Lumbering expanded in the area a few years later and the increased activity prompted the usual survey and improvement project. The plan adopted in 1880 called for a channel depth of five feet from the mouth of the river to Branford and four feet from there to Ellaville, a new sawmill community across the river from the abandoned site of Columbus. The establishment of the pencil industry at Cedar Key and the extension of the Plant System rail line to Branford kept the river relatively busy. Passengers and general merchandise moved up and down the river between the two railroad landings. Turpentine from half a dozen stills was brought by boat to the railroads for shipment. Cedar logs were rafted down the river and towed to the pencil mills by tugboats, along with lumber cut at sawmills at Ellaville, Lauraville, and Branford. But the volume of traffic was never great. The economic and physical impracticality of creating a deep water harbor at Cedar Key was soon recognized, and no attempt was made to do so. Finally, the hurricane that devastated Cedar Key in 1896 destroyed the base of commercial navigation on the Suwannee River.

The Oklawaha River became a renowned tourist attraction after the Civil War. An overnight cruise from Palatka to the Silver Spring on one of the unique little steamers with their enclosed sternwheels became an essential item in the Florida tour in the 1870s and 1880s. Contemporary descriptions of the cruise abound and explain its popularity. A small commercial trade also developed as the region was slowly settled in the 1880s, and in 1890 the government snag boat Shepard was put to work opening a clear channel to Leesburg. By 1896, however, the traffic pattern had changed radically. A freezing winter in 1895 crippled fruit and vegetable production in the area, virtually eliminating produce from river commerce. The steady expansion of railroad service cut heavily into both tourist and freight traffic and, by the end of the decade, lumber accounted for eighty percent of the river commerce. For a brief while the Oklawaha had a particular place in the romance of riverboating. But here, as on the other rivers of Florida, the romance was finally lost in the routine of the lumber trade.

Other rivers in Florida received attention from the Army Engineers. The Escambia, Withla-
The Hiawatha was one of many steamboats carrying passengers and freight on the Oklawaha River from Palatka to Silver Springs during the late 1800's.

The coochee, Manatee, and Caloosahatchee rivers were improved by federal projects. The Florida Coast Line and Transportation Company opened a channel through the Halifax and Indian rivers from St. Augustine to Jupiter Inlet, which was later maintained by the Army Engineers. But none of these waterways became commercially important. By 1899 the only river other than the St. Johns to carry a significant mixed commerce was the Choctawatchee, with five steamers still in regular operation between Half Moon Bluff and Geneva. The Oklawaha still enjoyed a seasonal passenger traffic. But with these exceptions, Florida's rivers were left almost exclusively to the lumber trade.

**Railroads Important**

The pattern of railroad development in each area also contributed to these diverse results. For Jacksonville, the railroads offered far wider access to the interior as they extended into the peninsulas as well as convenient and efficient overland connections with the north and west. Thus, they supplemented the St. Johns River as feeders to the port of Jacksonville. By contrast, railroad development in Georgia and Alabama attracted Apalachicola River commerce to railheads at Columbus, Eufala, and Bainbridge, making the Apalachicola-Chattahoochee-Flint waterway a feeder to the railroads connecting with the northeast and midwest.

When these lines eventually extended southward to connect with the east-west lines through the Florida panhandle, the river system soon ceased to play a major role in the transportation economy of the region.

Similar efforts, on a smaller scale, to develop other rivers in Florida met with limited or temporary success. Almost every stream that emptied into salt water, and some that did not, was examined by the Army Engineers, usually at the ardent urging of the local citizenry, to determine its potential for commercial navigation. Occasionally the Engineers would insist that some sluggish, shallow rivulet running from nowhere to no place was not worth improving. But, in most cases, they were able to justify some form of development on the basis of local insistence on the supposed economic potential of the countryside and prognostications for expanding commerce.

The Peace River in south Florida offers such an example. An examination of this river in 1879 resulted in a project providing a clear channel only fourteen to twenty-four inches deep and this only during the six months of the rainy season. An appropriation of $11,000 in 1882 was used to clear fallen timber and other obstructions for a distance of sixty-four miles. But the anticipated commercial development failed to materialize, and the subsequent completion of the Florida Southern Railroad to Punta Gorda eliminated all possibility of com-
But the steady extension and improvement of railroad service offered a superior alternative through faster, more direct, and more dependable facilities. The result was that by the end of the century commercial use of minor waterways all over the country was sharply curtailed.

Commercial traffic on the Peace River.

Several projects did result in substantial, if temporary, local benefits, however. Commercial traffic on the Choctawhatchee River, for example, was both supplemental to, and in competition with, rail transportation, and continued well into the twentieth century. A considerable waterborne traffic with Pensacola had developed by way of Choctawhatchee Bay before the Civil War. But wartime neglect had left the river almost completely obstructed when improvement efforts were resumed in 1874. By 1882 successive appropriations totaling $37,000 had reopened the river for year-round navigation to Geneva, Alabama, and at high water stages to Newton, some thirty miles farther upstream. In 1881 the Pensacola and Atlantic Railroad completed its line to the Apalachicola River, crossing the Choctawhatchee at Half Moon Bluff. The combination of river and rail transportation was a boon to the upriver agricultural region, while the availability of an all water route to Pensacola kept railroad rates within reason. In practice, the lower river was used almost exclusively for the rafting of timber to the sawmills at Milton and Pensacola.

Harbors Come of Age

The development of river navigation and commerce in Florida during the late nineteenth century was typical of the general pattern throughout the country. This pattern of growth and decline between 1870 and 1900 occurred in the context of complex changes involved in the continuing industrialization and urbanization of the country. It reflects the transition from waterways to railroads as the basic means of internal transportation which was an integral part of the geo-economic changes taking place. Federal improvement projects did stimulate commercial activity on the rivers in the 1870s and 1880s and, in some localities, provided the only means of travel and transportation available. But the steady extension and improvement of railroad service offered a superior alternative through faster, more direct, and more dependable facilities. The result was that by the end of the century commercial use of minor waterways all over the country was sharply curtailed.

Paradoxically, the ascendancy of railroads over river transportation made the development of Florida’s natural harbors economically feasible. Federal projects for harbor improvements at Pensacola, Tampa and Miami were initiated before extensive rail service was available, but it was not until adequate rail access to the hinterland was established that these cities began to develop as major seaports. For only then was Florida’s basic need for the integration of internal and overseas transportation satisfied. This need could not have been met by the development of waterways alone.

BIBLIOGRAPHY


Congressional Record, 39th, 40th, and 41st Congress (Washington, D.C., 1866-1870).


Next Issue: Canals and other waterways disrupt Broward’s native ecology.