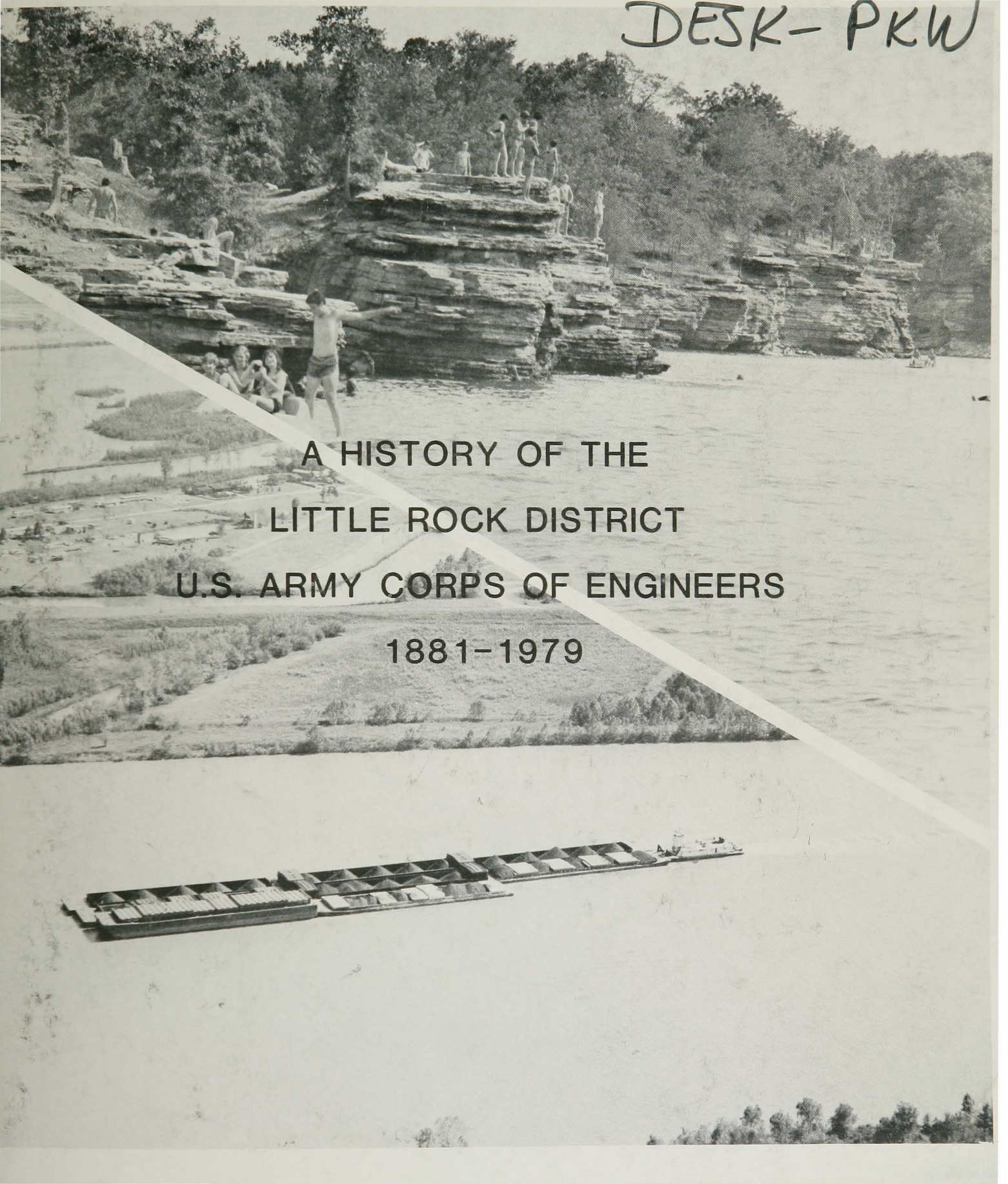


DESK-PKW

A black and white photograph of a river scene. In the upper portion, a rocky bank features a prominent, layered rock formation. Several people are seen swimming and standing on the rocks. In the lower portion, a large barge is visible on the river. The text is overlaid on the image.

A HISTORY OF THE  
LITTLE ROCK DISTRICT  
U.S. ARMY CORPS OF ENGINEERS  
1881-1979

# Report Documentation Page

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# A History of the Little Rock District U.S. Army Corps of Engineers 1881-1979

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First Printing 1971

Second Printing 1979

COVER: Many visitors enjoy recreational activities at Greers Ferry Lake; An eight-barge tow travels on the Arkansas River near Pine Bluff, Arkansas; Ozark Lock and Dam Powerhouse utilizes generators for hydroelectric power; Lake Nimrod Dam provides flood control.

# Foreword

Few people know the major roles played by the United States Army Corps of Engineers in the domestic systems of our nation. I was impressed but not surprised by this pervasive ignorance, for the Corps of Engineers does little to direct attention to itself, normally being content to let its own works stand as its marker.

I feel that the work of the Engineers is too important to be constrained within such modesty. The purpose of this history is to give the public a warm humanly inviting insight into the record of the Little Rock District of the U. S. Army Corps of Engineers.

The history grew from personal interviews, searches of public documents found in the District library, The Congressional Record, reading old files of local newspapers (especially the Arkansas Gazette) and intimate studies of personal papers.

I hope that every reader will grow to share my appreciation of the role the Little Rock District has played in the destiny of this region and our nation.

Floyd M. Clay, Ph.D.  
History Department  
Arkansas State University

# Preface to the Second Edition

This current edition brings you up to date on what has been occurring in the District since the opening of the navigation project. The interim years have been somewhat less dramatic than the epic struggle which restructured the Arkansas River as a major avenue of commerce, and created the great reservoir-hydroelectric network of north-central Arkansas, but the last decade has not been without drama, progress and service to the region. Please join me in retracing this short yet significant period in history.

Floyd M. Clay, Ph.D.  
History Department  
Holy Cross College  
Algiers, Louisiana

# The Beginning of the Corps of Engineers

In the formative years of the United States, the only school for training engineers was conducted in the U.S. Military Academy at West Point. When the Federal Government assumed responsibility for a transportation system of roads, canals, and waterways there was no alternative but to delegate the mechanics of the projects to the U.S. Army's Corps of Engineers. The situation was not unusual. Col. Robert R. Robertson, writing for the Armed Forces Management (February 1960), said that it was a commentary of modern civilization that "the material advancement of our race has been paced . . . by requirements of the military." Furthermore, it was only natural for the original emphasis to be on water transportation, for in the days of wilderness, Indians, and scarcity of labor, water routes were most practical. And historically, the paths of civilizations usually followed the water routes into the interiors.

In 1815 President Madison asked Congress to invest in a system of national roads and canals, promising that "no objects within the circle of political economy (would) so richly repay the expense bestowed on them. Congress responded with a resolution confirming its authority, under the improvement of water courses." In 1824 Congress passed the first rivers and harbors bill, charging the Corps of Engineers with the responsibility for maintaining those water routes, beginning the struggle between the awesome forces of nature and the small group of men known as the United States Army Corps of Engineers.

The original and almost exclusive work of the Corps consisted of snagging and dredging operations, and even these small efforts were often severely limited by incredibly small budgets. To the west, the Mississippi River and its major tributaries represented the nation's central transportation system, but it was a system in poor repair. The tributaries were proportionally worse. The Ohio was the backbone of the Great Lakes Region, the Missouri was the

gateway to the great and little known northwest, and the Arkansas pointed invitingly toward the Rockies.

Early transportation on the western waters consisted mostly of rafts floating down the various rivers to the terminal port of New Orleans, where the goods could be unloaded, sold, and then transported elsewhere by ocean-going vessels. The advent of the steamboat changed this basic, unilateral transportation system into a practical, two-way system that would supply the interior as well as export wilderness produce from the interior. The first steamboat to buck the current of the mighty Mississippi was the *New Orleans* which did so on the eve of the War of 1812.

These early steamboat captains were as adventurous as the hardy pioneers who were then beating back the wilderness in their struggle to establish themselves. The rivers were capricious, indolent, raging, turgid, peaceful, and ominous according to the whim of nature, but the captains took them on with amazing success. As in a cat-and-mouse game, captains eyed currents with nervous concern, and took the most logical chances. To miscalculate was generally disastrous.

The success of the United States in the War of 1812 opened up an era of intense patriotism and unbounded confidence. With it came the boom in steamboat construction for the Mississippi River trade. In the period 1816-1820, dozens of steamboats were constructed for the Mississippi River trade.

Though few people had ventured into the wilderness of the Arkansas territory, there were no practical motivations for steamboat activity on the Arkansas, yet steamboats on the Arkansas Rivers appeared soon after the first steamboats on the Mississippi. The first steamboat to nose into the waters of the Arkansas was the *Comet* which left New Orleans on March 23, 1820, and arrived at Arkansas Post on March 31. On the sixty-mile trip from the mouth of the



Hydraulic pile-driving on the Arkansas River at Pine Bluff, Arkansas in 1881, the year the Little Rock District was formed.

Arkansas to Arkansas Post, the *Comet* had run aground. The Captain had taken the "long" way up the river rather than the more practical way of entering on the White River and cutting over to the Arkansas a few miles below the Post. This short-cut was well known, even then. The captain's failure to utilize this route can only be attributed to his inexperience with the Arkansas River. In that same year (1820), one other steamboat ventured up the river to Arkansas Post, the *Maid of Orleans*. The *Maid* was noteworthy in that she had been built to sail on the high seas, yet constructed to traverse inland waterways under steam power.

Even before the Corps began its snagging and dredging operations in the West, the adventurous river captains had pushed on above Arkansas Post to the little settlement of Little Rock. In the spring of 1822, (March 16), the villagers of Little Rock were jubilant over the safe arrival of the steamboat *Eagle* as it puffed into view. The *Eagle* was little more than a packet, at 118 tons; but it was a harbinger, a forerunner of greater days to come. Margaret Ross, an authority on Arkansas River steamboats, said it was not the commercial importance of the fledgling territorial capital that attracted the *Eagle* but rather the need to supply Dwight Indian Missionary School further up the river in what is now Pope County.

The *Eagle* could not make it all the way to the Mission because of the prevailing conditions of the river. This experience did not deter other more successful attempts to go even further up the river. Within a few months another steamboat, the *Robert Thompson*, took advantage of better river conditions and made it all the way to Fort Smith. In high water periods it was possible for light draft boats to ascend as far as Fort Gibson, in the heart of Indian territory.

In 1832 Congress turned its attention to the Arkansas River specifically, and through the River and Harbor Act of 1832, the Corps was authorized to maintain a channel in the Arkansas River. The channel was to be wide enough and deep enough for "free passage of heavy boats," and was to be kept open from the mouth of the river to the mouth of the Grand (Neosho) River, near present-day Muskogee, Oklahoma—a total channel distance of 465 miles. The Act did not provide for any permanent improvements, only snagging, dredging, revetments, and "contraction works," to confine the river channel. This too, was the usual procedure. Neither the Nation nor the Corps had the capacity to undertake greater projects.

But to get the job done under even this limited authority, the Corps was curtailed by insufficient funds. In those days the Corps worked at snagging until the money was gone, then simply stopped work until the next year when more funds again became available. Since no method of transportation was fully developed, a partially opened river was not considered any more reprehensible than a partially opened road. Man took what was offered with

gratitude.

National growth and the westward movement was recognized through more vigorous action by Congress in 1850, when it appropriated \$50,000 for a study of conditions on the Mississippi River and its tributaries. As all suggestions seemed hopelessly expensive, the study accomplished little more than to prepare the way for greater studies.

The Corps activities on the Arkansas were sufficient to excite a further interest in the profitable river trade, and in the pre-Civil War period, several little shipyards turned out steamboats and steam powered ferries. Most of the crafts were launched as hulls and floated downstream to New Orleans for outfitting of engines and other hardware. These boats were specifically designed for Arkansas waters, and since the Arkansas usually ran shallow, they were limited in size and designed for minimum draft. The *Neosho* constructed at Van Buren, Arkansas, by Captain Truesdell, drew only 13 inches of water, but did not hold the record long. In 1855 a Little Rock shipyard launched the *Know-Nothing* (named after the American political party). The *Know-Nothing* drew only three inches with an empty hull, and only six inches when fully loaded. Two years later Little Rock launched the *Rock City*, a steamboat of 250 tons, 127-foot long, 28-foot beam, 16 staterooms, and other civilized accoutrements. Design ingenuity kept this relatively large packet to a scant draft of 10 inches. With this sort of engineering, and with the help of the Corps of Engineers the river trade increased in volume, value and frequency.

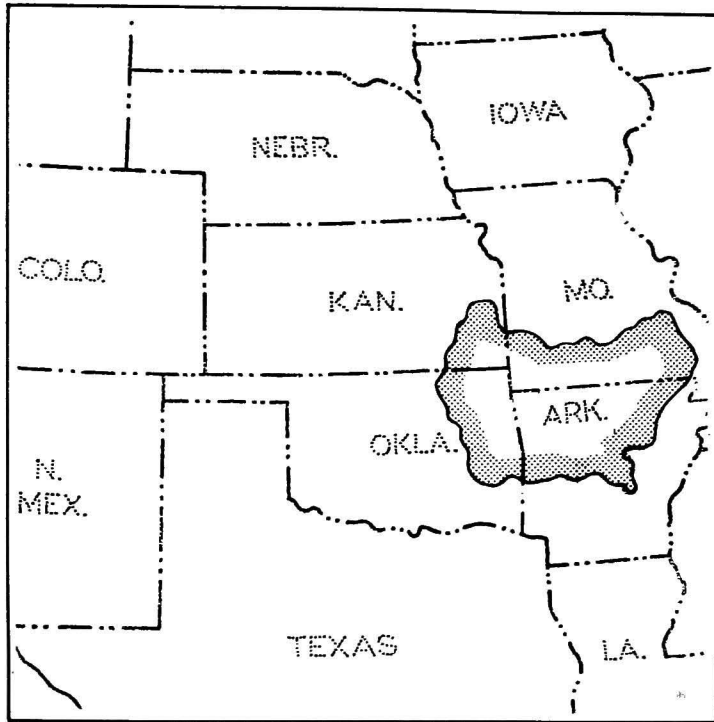
Successive river and harbor bills throughout the 19th century authorized more channel maintenance work for lesser known tributaries in Arkansas; the Fourche La Pave, the Petit Jean, the White, the Little Red, the Black, the St. Francis, the Cache, and the L'Anguille. The appropriations could not be increased proportionately.

By the 1870's the Engineers wanted steel-hulled snag boats because their own wooden-hulled snag boats were being sunk by submerged hulks and snags. In 1872 the Arkansas Gazette published a list of 117 steamboats which had already been lost on the Arkansas, and the list was far from complete. Although a few terrifying boiler explosions accounted for some of the sinkings, the majority of the boats were sunk by snags.

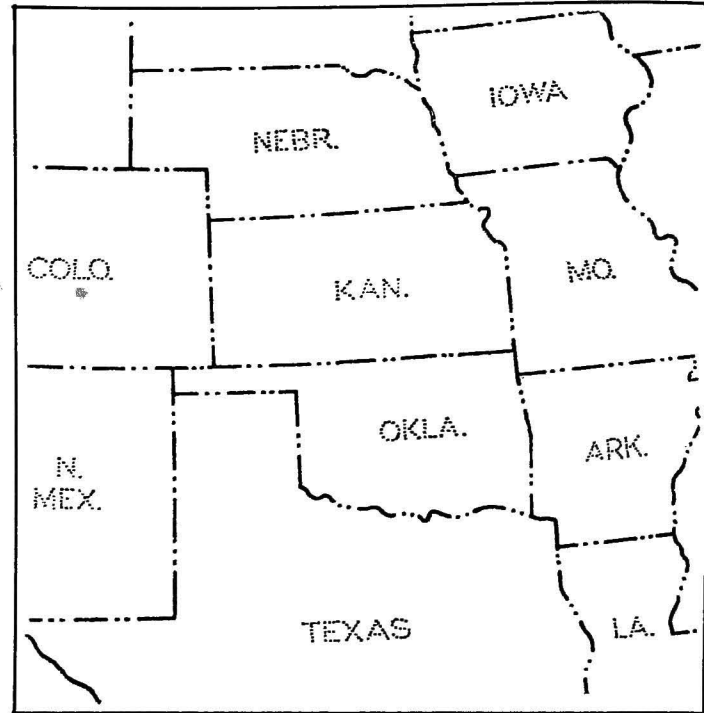
In 1873 the District Engineer at St. Louis suggested that the snag problem could be reduced if tottering timber were cut from eroding banks, and the banks themselves be given some kind of protection. This suggestion was financially prohibitive.

It was not until 1878 that the first contraction work on the Arkansas river was performed—the construction of a brush and stone dike designed to slough away a sand bar in front of the Fort Smith landing. The success of this effort encouraged the Corps to more ambitious projects, but the greatest impediment was still money. The appropriations barely paid for the small snagging operations.

# LITTLE ROCK DISTRICT



1881-1921



1921-1937  
(Transferred to Memphis District)



1937-1939



1939-1971

# The Birth of the District

When the Arkansas and its tributaries increased in commercial importance, the Corps of Engineers established an Engineer Office at Little Rock in 1881. Captain Thomas H. Handbury became the first District Engineer of the new Little Rock District.

When Captain Handbury arrived at Little Rock, it was a rough frontier town; the main street was a dirt path between rows of wooden, one-story buildings. Outside the town, robbery of stagecoaches was a major travel hazard. Captain Handbury called for a complete survey of the river so that a permanent improvement program could be formulated.

On the Arkansas a town with special problems was Pine Bluff. The town was located on a bluff of about 45 feet high, situated at the outside edge of a sharp bend in the Arkansas River. Even during normal flows, the river gnawed into its soft bank, but during times of high waters and floods, the bank was flushed away in prodigious quantities until parts of the town of Pine Bluff began to slough off into the swirling waters of the Arkansas River. Street after street was undermined and caved into the water, and the distraught citizens sought help from the District Engineer.

The problem of erosion was only one of two major problems facing the town. The second was the possibility that the river would cut through at Yell Bend, approximately 3.5 miles beyond the town.

Such an occurrence would leave Pine Bluff high and dry, but far removed from the river. To resolve these two major problems, Captain Handbury suggested that Yell Bend be strengthened and the curvature of the river facing Pine Bluff be made more gentle. Such work was commenced in 1882, beginning the second contraction work on the Arkansas. It was not too successful being limited by funds, but the citizens of Pine Bluff were encouraged by the concern of the Engineers. Having no alternative for

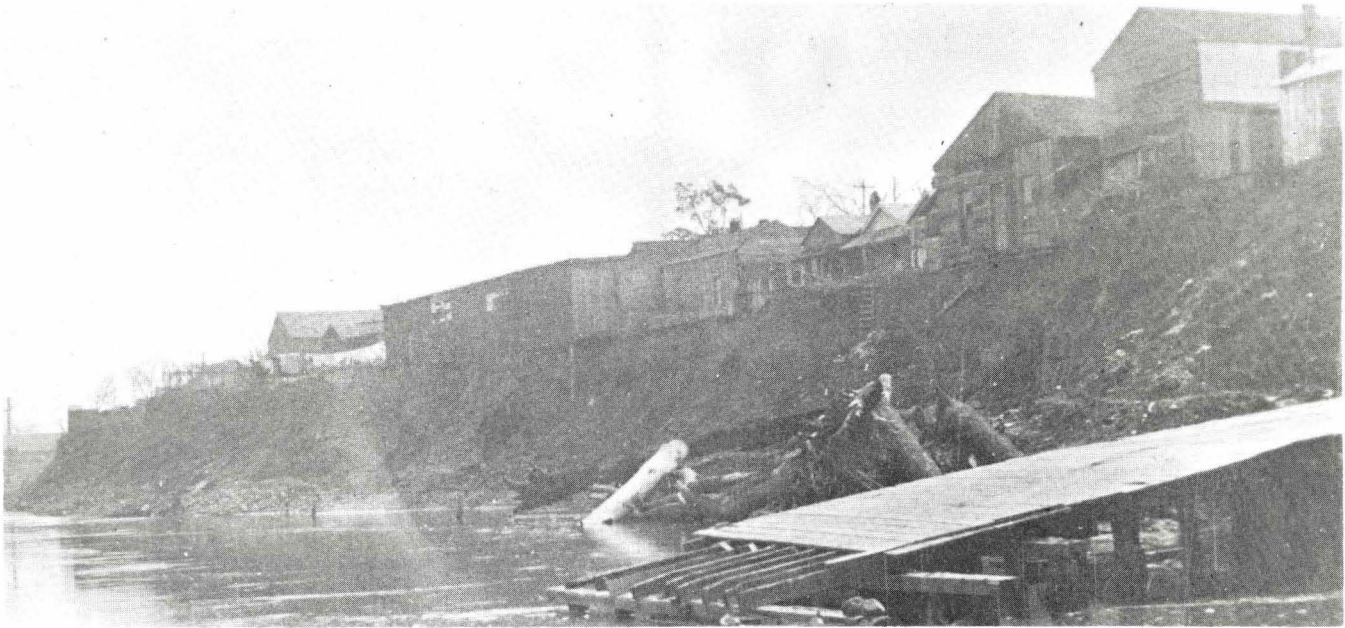
the time being, the Corps continued to make these temporary improvements on a year-to-year basis, and just as regularly the river swept away these temporary improvements.

By 1885 Captain Handbury had completed his survey of the Arkansas River to Wichita. For the first time, it was possible to have an accurate view of the Arkansas River with its problems. About the same time he began to devote more attention to the White River, since it was another practical route into and out of the interior. Furthermore, the swift-flowing White generally ran deeper than did the Arkansas and served an area that was not served by any parallel stream. No railways had pushed into the sparsely settled area.

The waterway had become the lifeline of the farmer. The River and Harbor Act of 1876 had extended snagging operations upstream as far as Buffalo Shoals, and subsequent Acts extended navigation even further.

By 1883 the District Engineer reported heavy traffic on the White River: 20,000 bales of cotton, 30,000 sacks of seed, 1,000 tons of cotton seed, 5,000 tons of assorted merchandise, 1,000,000 board feet of walnut timber, and large quantities of corn, ores, and other commodities. He cited these statistics to substantiate his request for permanent improvements.

For a while the White River seemed to override the Arkansas in importance. When the Corps was asked by Congress to initiate major improvements for navigation, in the form of locks and dams, those improvements were made on the White rather than the Arkansas. The River and Harbor Act of March, 1899, authorized 10 fixed dams with concrete locks, all to be located between Batesville and Buffalo Shoals. Eventually three of those locks and dams would be completed, with Lock and Dam No. 1, at Batesville, completed and in operation on October 16, 1903, and No. 2 and No. 3 not far behind. Much of the swift White



By 1900 the Arkansas River banks had eroded to the foundations of buildings in downtown Pine Bluff, Arkansas.

River was parallel by the railroad in 1903 when it completed its line from Batesville to Harrison, and on to Carthage, Missouri. The railroad offered more dependable transportation, displacing the need for river traffic. In 1903 the District Engineer recommended that no further work beyond the completion of Lock and Dam No. 3 be undertaken. Congress responded by authorizing the abandonment of the project after the completion of Lock and Dam No. 3. Locks and Dams Nos. 1, 2, and 3 were operated for many years afterward.

The railroads were also beginning to take their toll on Arkansas River traffic, but the railroads themselves were sometimes in trouble. During high water periods, the rail lines were often unusable. Conversely, the steamboats were in their best operating environment during high water. In 1882 train service was disrupted between Memphis and Little Rock, and the railroads were placed in the embarrassing position of having to charter steamboats to maintain the railroad contracts between those two points. Also, the railroads sometimes complained that they could not compete with the low freight rates of the steamboats. Competition engendered a tactic called the "Chinese Wall." Under this system the railroads would charge a high rate for hauling from a river terminal to an inland customer, but would charge that same customer considerable cheaper rates for hauling his freight directly from the source to

the customer. Considering the uncontrolled and unregulated rivers, the dependability and service offered by the railroads, plus the competitive tactics, the water routes generally suffered most. Overland hauling was not yet competitive because of poor or nonexistent roads. An example of road conditions is well illustrated by an article in the Arkansas Gazette of April 10, 1880. The Gazette noted, with amazement and pride, that Joe Berlin had made the 45-mile trip from Pine Bluff to Little Rock in the record time of 5 hours and 52 minutes, using only a light buggy and a team of fine horses.

In 1884 the railroad between Little Rock and Fort Smith was completed, and work was started on a bridge across the river at Little Rock. The day of the steamboat was past, though not immediately evident.

In 1884 Captain Henry Sheldon Taber became District Engineer. During his nine-year tenure, the District throbbed to increased tempos. Captain Taber promoted the Locks and Dams on the White River and succeeded in saving Pine Bluff from the Arkansas River through "permanent" improvements. It was Captain Taber who succeeded in establishing the Corps as one of the most efficacious branches of the Federal Government, becoming more esteemed in the minds of the local people.

At that time there was relatively little departmentalization, and a person worked at whatever he thought he could

accomplish. That independence extended down to the lowest level of Corps activities — from the Chief of Engineers to the survey crews. Conversely, no one seemed to be immune from any problem. For example, in 1885, a Corps employee died in Little Rock, leaving a small debt to his boarding-housekeeper. Taber wrote of his concern to the Chief of Engineers, who, in turn, bucked the trivial matter all the way to the Secretary of War.

The District Engineers usually received a lump-sum appropriation for navigation operations, and allocated that money so that it could be efficiently utilized. The District Engineer could expect little help and no advice from the Chief's office in Washington. It was the District Engineer's recommendations that were relayed to Congress for consideration. Those requests often were for more and better snagboats. Only occasionally were they concerned with a demand for anything approaching a major program.

While snagging was not only the major concern of the Corps, it was the most beneficial. As an example in 1882, when the Corps reported operations on the Saline River, it was reported removing 466 stumps and snags, 5,633 overhanging trees, and girdling another 236 trees on the banks. On the other hand, the loss of a packet and cargo represented a loss of \$15,000 to \$75,000 for the owner, and was often the ruination of a small company. Even so sinkings were routinely expected. One shipper in the year lost five of his six steamboats. In 1887 the President of the Memphis, Vicksburg, and Arkansas City Packet Company was so elated at having lost no boats during the year that he

Snag boats worked their way upstream by cordelling. Crewmen would row 1200 feet of towlines in a skiff and secure

wrote the Corps of Engineers of his gratitude. He had been involved in river traffic 32 years and "there had been no year up to the last one when there has not been one or more boats sunk by snags on this (Arkansas) river." He attributed that immunity "wholly to the United States snag-boats."

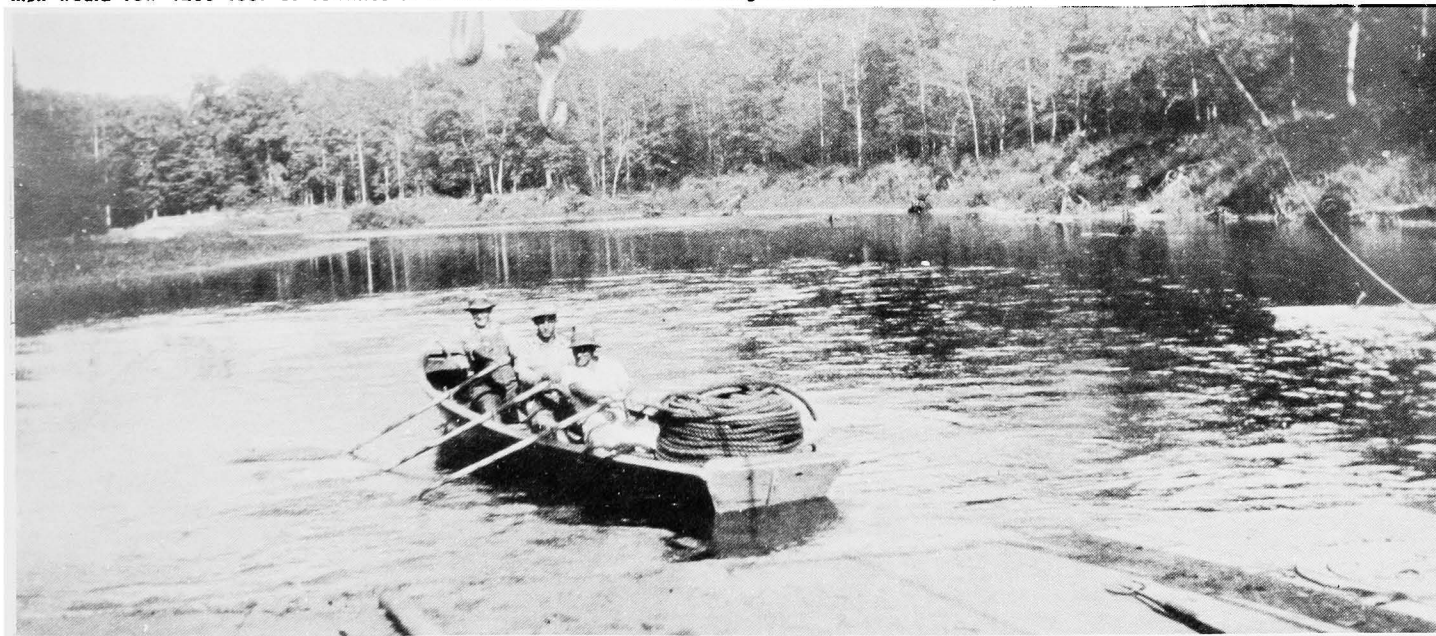
Snagging was accomplished from an especially constructed boat with an "A" frame and winch at the forward end. The crew attached lines to the stump, tree, or other obstruction and the object was winched free. If practicable, snags were removed to out-of-the-way locations, but often the objects were merely turned loose and allowed to float on down the river.

The snag-boats worked their way up river by "cordelling." In cordelling, two crewmen loaded 1,200 feet towlines into a skiff, and a third crewman rowed upstream to secure the lines to large trees on both banks. The snag boat was then pulled upstream by means of the winch. The winch was usually powered by a steam engine, but some were operated by hand.

Mr. Harmond Black had a typical snag boat career, starting out as a dishwasher (\$40 a month), and moving up to deckhand (\$70 a month). It was strenuous work, yet filled with satisfaction and frequent horse-play. The Captains were stern task masters and often assumed the responsibility for the education and morals of the young crewmen. Captain Ansell read the rules to them, but also read the Bible to them.

In the 1890's the completion of various railroad spurs

the lines to large trees on both banks of the river, allowing the snag boat to be winched upstream.



along the Arkansas began to have a serious effect on river traffic. Railroad bridges at Little Rock and Fort Smith disrupted regular river commerce. The Secretary of War approved the Fort Smith bridge at the urging of the citizens of Fort Smith and Van Buren, who considered the railroads of greater value to them and their cotton crops.

Regardless of the trend, Captain Taber continued to see the future of the Arkansas River in terms of ever increasing importance. In 1887 he wrote, "The future of Little Rock seems bright in connection with the Arkansas River. When the vast acreage of the Indian Territory is brought under cultivation its products must go this way. That already well known and fertile state of Kansas will find Fort Smith or Little Rock its nearest water outlet."

Captain Taber also noted that Pine Bluff was safe because of the permanent improvements he had installed. "The town has taken on a new life, street railways, new water works, and a fine hotel," all secure behind the point which had been most dangerous until then. He felt that his three-year study proved that "the State of Arkansas will ere long rise many files in the rank of States, and public improvements will return manifold their cost in material benefit to the entire State."

Captain Taber devised ways to stretch his appropriations, such as using boxes of sand as ballast for his dikes, but his constant plea was for more appropriations for snagging. In 1891 he felt that the Arkansas River could be cleared of all existing snags and obstructions within three years, and that the unobstructed conditions of the river would invigorate river traffic. He said that cotton could be carried "25 to 50 cents cheaper per bale by water."

Taber never had a chance to see if his ideas would hold, because Congress could not give him the financial support he wanted. He was expected to improve the river with an appropriation of only \$470 per mile, whereas his lowest estimates showed a necessary expenditure of \$14,000 per mile.

To support Captain Taber's plans, the city of Little Rock created a Board of Trade. A "river convention" met in Little Rock attended by bankers and merchants who gave vocal support to their featured speaker, Captain Taber, but it produced no more success than did Taber alone.

In 1892 Captain Taber suggested that fixed points be set and work be entirely completed between these points on the river, as opposed to the small projects being undertaken in a number of places. Without waiting for specific authorization, Taber began to fix these points and to work toward these specific goals.

The Panic and Depression of 1893 wiped out his hopes. It was not the nature of the Government in the 19th century to respond to depressions by creating or augmenting public works. Congress did not reduce river expenditures, but neither did it increase expenditures as Taber had hoped.

In 1894 Captain Carl F. Palfrey succeeded Captain Taber who, by then, was in poor health. Though only 44 years old, Taber died within a year, but his vision and his aggressiveness inspired his successor. Within a few months Captain Palfrey was echoing the requests of his predecessor in almost the identical phrases.

In 1895 the Corps decided to explore the feasibility of maintaining a five-foot channel upstream from Little Rock. The existing effort was only for a two-foot channel. In a stretch of 21 miles of river marked off above Little Rock, the District attempted to increase the depth by diverting river flows between dikes and revetments. The crisis of low water in 1897 hampered the Corps efforts. The channel depth dropped to 1.4 feet—only .4 of a foot higher than it would have tried to maintain under the established free flow system. Unfettered in her will, the Arkansas River scoffed at the effort and rose to flood levels the next year (1898). Her raging currents wiped out the experimental works, leaving the stretch as nature would form it.

Captain Palfrey remained in the District less than a year, being succeeded by Lieutenant W. L. Sibert. Sibert, later a leading figure in the construction of the Panama Canal, eagerly accepted the challenge of the Arkansas River, but like Taber found his efforts were restricted by Congress' limited funds.

The flood of 1898 was only the first of several major floods to wreak havoc in the District. At the time, the Corps was not so deeply committed by Congress to the control or elimination of floods, for floods, like depressions, were considered acts of God, best handled by God. Levees were the responsibility of private citizens or townships, and the Corps was only a concerned bystander. Of course the floods did reinforce the urging by the Corps for a more comprehensive river control program.

Before the flood had run its course whole families had been wiped out, Van Buren was under water from six to ten feet in depth, Argenta (now North Little Rock) was partially submerged and the current was so strong that steamboats could not make headway against it. The District did send one of its boats, the *Beauregard* captained by Lieutenant Sibert, down the river to Pine Bluff, to render assistance to those stranded people. Upon arrival Lieutenant Sibert found Fifth and Sixth Streets completely under water and the "permanent" improvements of former District Engineer Taber swept away and well on their way toward New Orleans. Pine Bluff was once again vulnerable. Sand bars blocked channels and new snags became firmly anchored in the stream bed. Congress, confronted with the Spanish-American War, felt that all domestic problems, especially in the wilderness of Arkansas, were secondary.

It was a victory to have Congress agree, under those conditions, to the creation of a Board of Engineers charged with the task of examining and surveying the Arkansas River once again, and to submit a plan to Congress for permanent improvements on the river. At the same time,

further expansion of services by railroads attracted traffic away from some rivers. The District withdrew its snag boats from lesser tributaries including the Current River in Missouri, the (Grand) Neosho River in Oklahoma, and the upper reaches of several others.

Despite railroad difficulties during infrequent times of high water, their advantages and competitiveness drove the steamboats further into retirement. One of the most profitable legs of the river traffic, from Little Rock to Memphis, which offered daily service between the two cities, was finally abandoned in 1910. The old St. Louis, Iron Mountain and Southern Railroad (now the Missouri Pacific), in the face of higher freight charges, was considered the most efficient alternative. Since river traffic was essentially a passenger and freight business, the concept of barge traffic did not excite much interest at that time.

In 1898 the District was placed in the charge of Captain H. C. Newcomer, who held the reins for a few months, then was replaced by Lieutenant Robert McGregor, who assumed the duties for a full tour (1899-1901). Lieutenant McGregor had the pleasant task of announcing that a contract for the construction of the Choctaw and Memphis railroad bridge had been awarded to the McGhee, Kahmann Company of Kansas City.

The projects along the Arkansas River were badly in need of repairs. Little was done by the District in 1899 because of financial problems. All new projects on the White River were suspended for fear that they might cause changes in the channel—changes which might necessitate expensive construction modifications in the proposed White River locks and dams. There was a growing concern that Congress would not pass any rivers and harbors bill in the forthcoming year, a rumor that stemmed from a statement by Representative Burton, Chairman of the Rivers and Harbors Committee.

The District had hoped that in 1900 it would begin construction on the lock and dam projects on the White River, but difficulties in getting the necessary land caused the work to be delayed another year. The District contented itself with routine snagging and dredging. It also made some repairs to damaged works caused by the great flood of 1898 on the Arkansas River. The flood had caused extensive destruction at Greathouse Bend. The river was threatening to change its course and wash away the improvements which the Engineers had intended to protect Little Rock. Inadequate appropriations compounded the gravity of the situation. But nature seemed to have relented. In this instance, the Bend held even though "little, if any, real progress toward the desired end" was made.

The District did take a major step toward the desired end when it installed water gauges at strategic locations on the various rivers in Arkansas. A running tabulation of river levels gave the District Engineer concrete information he needed for planning future flood control and

navigational works.

In 1901 the District changed commands. Captain Charles L. Potter held the appointment one month then in April, Captain Graham D. Fitch assumed command.

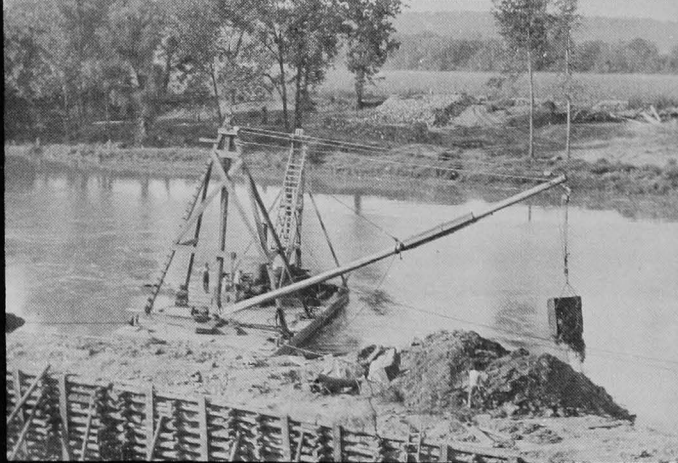
The year was occupied with snagging, dredging, and accepting delivery on its new steel-hulled snag boat, *Arkansas*. The snag boat was especially useful due to relatively low levels of the rivers, but had to suspend its operations when funds became depleted. During the next few months four steamboats were sunk by snags. River Captains spared few words in commenting on the parsimony of Congress. The excursion boat *Dardanelle* carried on a lucrative business by maintaining its operations close to Little Rock, and by offering excursions to "churches, Sunday schools, mystic and club societies."

The financial picture did not improve. In 1902 Captain Fitch had to discontinue snagging operations on the White, and he reported that five barges—one quarter boat, and two scows—were condemned during the year. He warned that unless appropriations were increased, the activity of the District would be confined to care of property with no snagging being done on any rivers. He did report that the principal commercial operation on the White River was the lumber industry. Even though that business was increasing rapidly, some lines—particularly the Newport and Memphis Packet Company were withdrawing from the White because the Engineers could not keep the river cleared.

To add to the disaster nature again laid her will on the Arkansas River. Instead of sending a raging torrent down



District Offices were located here in 1900 at Ninth & Center Streets in Little Rock, the present site of the Arkansas Power & Light Company offices.



Removing excavations from lock pit, Lock No. 1, White River.



Excavation of abutment, Lock No. 1, White River.



Excavation of Lock No. 1 near Batesville on the White River in 1900.

the channel, it withheld rainfall shrinking what used to be a majestic river to a muddy and sandclogged stream. River commerce, already badgered by accumulating snags, had its problems compounded by abnormally low water. The dry year exposed more snags and sand banks and reduced the navigation channels to impossible shallow depths.

The "disastrous drought" began in April 1901 and lasted until February 1902, bringing with it financial ruin to many and placing whole communities under the care of charitable organizations.

It was many months after normal rainfall had resumed in the valley before the Arkansas River regained its normal flows. As late as December 1903, the editor of the Arkansas Gazette could report that the river was then at the lowest stage recorded in many years, where it was "in some places not more than 3 feet deep." He reported three boys wading across the river below Little Rock, and said the water "did not come up over their knees." Captain Fitch's attache doubted the story, but he did concede that it might be possible to cross the river in a buggy.

If nothing else, the drought had the salutary effect of

getting money from Congress, for the Corps was able to resume full-time snagging operations in 1903, and to let contracts for repairs to revetments at Red Fork and on the White River. Captain Fitch said that while work was continuing on Locks and Dams Nos. 1 and 2 on the White River, it was slow and expensive. In his official report, Captain Fitch noted that river traffic was diminishing in the face of increased railroad competition, and in the report concurred with the recommendation to discontinue the White River projects.

Nature emphasized the distraught condition of the Engineers working on the White River by carrying away a complete set of gates from Lock No. 1, and washing away an earthen section. Despite these setbacks, Lock and Dam No. 1 was functioning by the end of 1903, and work was well under way at Lock and Dam No. 2. Typical of the nagging problem of insufficient funds, these expenditures were recorded for the operation of Lock and Dam No. 1 for the year:

|  |       |
|--|-------|
| Wages of one lockman, 6 months, at \$50..... | \$300 |
| Labor (service) 90 days at \$1.50 .....      | 135   |
| Lights and fuel, 6 months at \$10 .....      | 60    |
| Redredging after the Spring .....            | 80    |
| Miscellaneous supplies .....                 | 25    |
|  | —     |
| Total .....                                  | \$600 |

Dam No. 1 was built in the manner of the day: Large timber cribs, constructed from trees that were felled near the site and shaped into 16" x 16" timbers. The cribs were floated into position, filled with rock, sunk, and capped with concrete. It was the work of men and muscles, but it accomplished its purpose. Periodically a section would wash away, but such an occurrence was expected as a matter of routine. The missing section would be repaired promptly in the same way that it had been built originally.

The White River dams had not been constructed for flood control purposes, but rather for navigation. Many local citizens resented that fact, and complained when the dams disappeared under flood waters as they were designed to do. Instead of having water release valves or gates, the flood waters merely welled over the top of the dams. Mr. John Morrow, Sr., of Batesville, a politically active figure of the area and sometimes called the "Father of the White River Projects," expressed an often heard opinion when he said that the whole White River project was a disappointment to the local people. The dams did not control the floods, and the locks were on the only part of the river that was navigable without locks. According to White River Captains and local citizens along its banks, the most troublesome portion of the river was that between Newport and Batesville. Above Batesville the river tended to be narrower; hence deeper and more navigable.

The remainder of the White River project was abandoned but the existing locks and dams continued to operate until January 1952, amid frequent rumors about

"blowing" the works. By the 1950's river traffic on the White had deteriorated to a few shell barges and rock barges. The District sealed the locks, but left the dams in place. The city of Batesville was given Dam No. 1, and has utilized the small pool for city recreational purposes and as the site of the annual White River Water Carnival.

Since World War II a whole new White River program has been undertaken and completed. The new program has no apparent relationship to the first and has no part in navigation of the White. As a matter of fact, the new dams have precluded navigation of the upper White River stretches. The upstream reservoirs which control flood flows on the White River have revived talk about the importance of navigation on that old commerce route.

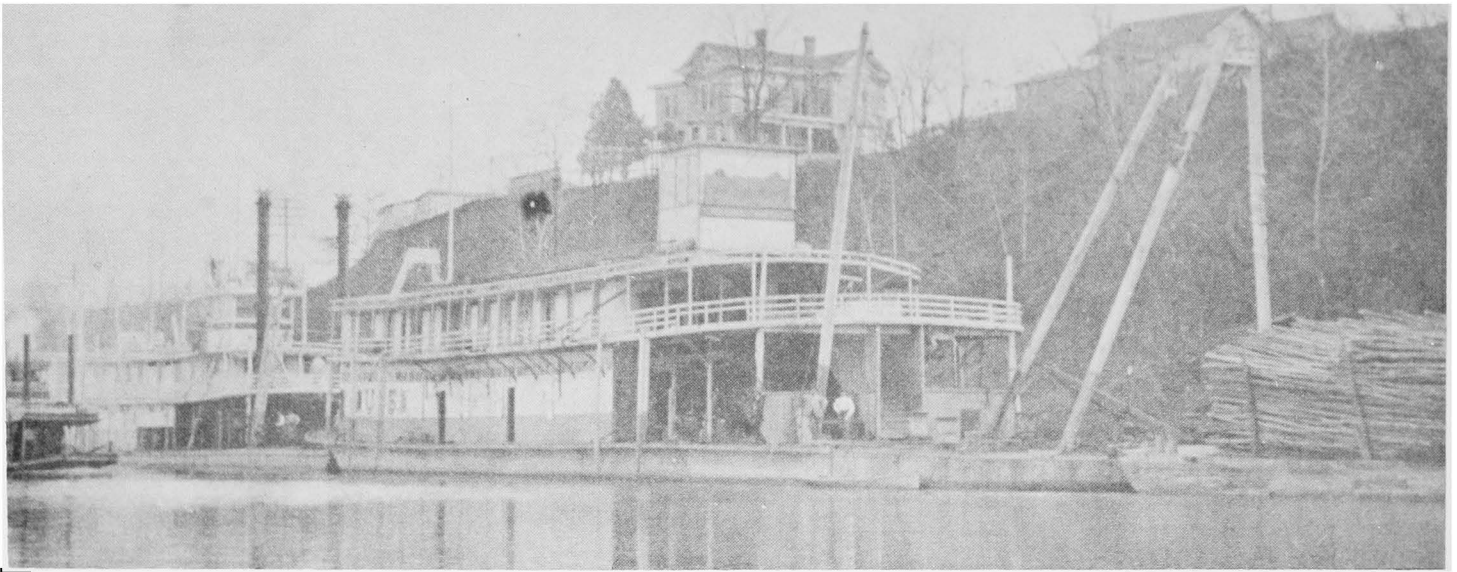
While the White River was so called because its waters were clear, the Arkansas River was quite another matter. In normal times on the Arkansas River, tons of silt were carried past any given point every hour. In 1904 the Gazette reported boats were tied up at the levee because of the "thickness" of the water—estimated to be about one-third mud. The sediment caused the water to foam when pumped into the boilers and gauges and regulating equipment could not function. Such an extreme condition did not often occur, the last was reported 11 years earlier. But the same condition arose again in the following year due to a flood on the sediment-filled Canadian River in Oklahoma. Once again all steamboat navigation was suspended for about 10 days.

In an effort to do something about the intolerable condition of the water, sulphate of iron was added to it as an experiment aimed at settling out the impurities in the river water. The experiment must have indicated some hope of success, for the Gazette noted that there was a general feeling that the water supply for steamboats would "return to normal" within a matter of days.

The abnormally cold winter of 1904-1905 brought a complete halt to river traffic. For the first time in the memory of the "old timers" the Arkansas River was frozen over. At Little Rock groups of skaters cavorted about on the ice as the police issued its warnings.

Little work was done on the Arkansas River in 1905, and indeed it seems to have been a year of introspection. The District Engineer reported that the works erected on the Arkansas River for the permanent improvement of the stream were of "no material benefit" to navigation since they had been built in disconnected reaches of the river. There was less snagging work done on the river because of decreased importance of river traffic as railroads absorbed more of the commerce movements. The District Engineer contemplated no new work and was absolutely negative about the possibility of reviving the White River Navigation Project.

River traffic was in a dying state. Railroads not only took an ever increasing amount of traffic from the river, they also contributed to the decline of river traffic through



Little Rock, January 1900: Steamboats C. B. Reese and Beauregard are moored along the bank with the Myrtle Corey coming upstream.

the construction of numerous railroad bridges across the rivers.

Those who derived a living from river traffic or who felt that it could not be abandoned, did not consider its demise inevitable. Regional Waterways Conventions were held to discuss the problem and to consider tactics which might restore governmental support to the sagging river economy. Locally, various cities along the major rivers formed River Improvement Associations such as the Arkansas River Improvement Association. The ARIA included representatives from Little Rock, Fort Smith, Pine Bluff, Dardanelle, and the Indian Territory towns. A National Rivers and Harbors Congress was held in Washington, in 1906, petitioning for a Federal increase in waterways expenditures from \$20 million to \$50 million. Local pressures were such that a man's election to Congress would hinge around his attitude toward Federal aid for river traffic. The Commerce Club of Muskogee, Oklahoma, made a trip down the Arkansas to Fort Smith to publicize the fact that navigation was still possible and feasible to that stretch of the river.

In their anguish many river proponents believed that the U. S. Engineer at Little Rock, Major Fitch, was being obstinate in not recommending more massive permanent improvements along the rivers. Major Fitch pointed out in vain, that such expenditures were not justified, the traffic situation was in a transitional stage, and that Congress would not appropriate funds for permanent improvements because the traffic was not there anymore. This disconnected character of the existing permanent improvements, he said, would discourage further expenditures.

Unwilling to accept any excuse, the river improvement associations in the District eventually persuaded Congressman Robinson to ask for the recall or transfer of Major Fitch. General McKenzie, then Chief of Engineers, refused

to consider it, saying that he would not be put in the attitude of removing a man for doing his duty. Even so, within a few days it was announced that Major Fitch, who had completed his normal tour of duty, would be transferred. The Gazette expressed the opinion that a more cooperative and optimistic replacement might be found — one who would “look with favor upon the efforts being made to secure improvement of the rivers and (one who) will cooperate with the citizens in securing the improvement.”

Captain W. D. Conner, who replaced Major Fitch, could not change the decline in river fortunes, of course, and the situation continued to deteriorate. No new work was authorized, and Corps' activities declined as commerce on the river shriveled.

Some private individuals undertook projects designed to protect their own property. Harry Keatts and T. C. Brown contracted with the River, Rail and Harbor Construction Company of Jackson to protect about 1 mile of caving bank along their plantation. In 1911 the Little Rock Packet Company created its own construction company to deepen and straighten channels of the Arkansas River, and to prevent caving of banks. Among the interesting innovations would be the use of wicker basket dams, which allowed the water to run through while the sand and sediment were collected by the dam. The dams were anchored by concrete blocks. The wicker basket dams were not full dams laid across the river channel. They were more properly described as wing dams designed to force the river into a smaller channel and thus, make it deeper. The innovation was called the Kerr-Gabion system, from its innovators with the River, Rail, and Harbor Construction Company. It was recommended as a practical system that could be used by farmers who needed to do something about caving banks. It was a desperate solution to a nearly impossible situation.

By now Congress believed the decline of river commerce had so changed the benefit-cost ratio that nothing more than minimal work on the rivers was justified. But the great flood of 1912 restored interest in flood controls and river improvements. It was a national flood, overflowing the entire Mississippi Valley, the Ohio and the Missouri Valleys. The disaster was of such magnitude that it revived support for national improvements on the waterways, if only in the interest of preventing such future disasters.

During the height of this flood, one eastern Arkansan observed hundreds of head of cattle and hogs floating toward the Gulf; Memphis was hard hit, with whole sections of the city under water.

As the disaster mounted, Government aid was sought and obtained for the first time. Some Government engineers were put in charge of strengthening levees, while others rendered great assistance in the transportation of food and tents to flood victims. On direct appeal from the distressed citizens, President Taft dipped into his emergency fund to render more national aid. He also made a personal visit to the ravaged areas.

It was the flood of 1912, then, that reoriented national interests back to the river. It was a different interest, however, for now the preoccupation with the river as an

Arkansas River map books made from 1870 field notes and published in 1887. A. R. Traylor, Chief, Mapping Section of the Little Rock District, started his career in the Memphis District in 1928.



avenue of commerce and transportation was almost abandoned in favor of direct involvement in river improvement and flood control. This was the first time that a President had included river controls as part of the goals of his Presidential administration. Simultaneously, individuals and private companies gladly relinquished the thankless and hopeless task of trying to maintain rivers through private venture.

The new emphasis on flood control went hand-in-hand with another national development of the period that Professor Charles K. McFarland calls "an almost unconscious effort to regulate transportation and the construction of hydroelectric dams in the national waterways." The General Dam Act of 1906 had indicated the earlier concern with navigation as the nation's primary interest. It specified that a dam permittee had to be responsible for the construction, maintenance, and operation of locks and other navigation facilities ordered by the Government; that such items had to meet with the approval of the Chief of Engineers and the Secretary of War. The rapidly declining interest in water transportation, assisted by the flood of 1912, caused the Government to shift its primary interest to flood control and regulation of hydroelectric facilities, for there was no conflict of interest between flood control dams and hydroelectric dams.

Various River Improvement Associations sought to use the disaster of 1912 to revive interest in navigation, and to call attention to their proposed programs. The Inland Waterways Commission, established by Congress in 1907 and charged with the task of investigating causes behind the decline of river traffic, and making recommendations designed to reverse that process, was beset by river commerce proponents. The Little Rock Chamber of Commerce, through its secretary C. C. Kirkpatrick, asked the Federal Government to take charge of and permanently maintain all levees along navigable rivers.

Public pressure increased as the full extent of the flood losses became known. The Memphis District of the Corps of Engineers announced that over 7 million acres of land had been covered by the flood. As usual, Pine Bluff was being washed away in great chunks as the river slammed into the bluff and carried off portions of the water front.

By June of 1912, a Flood and Drainage Conference at Chicago was calling upon both the Democrat and the Republican parties to include planks in their political platforms to provide for flood control. In December Congressman H. J. Jacoway proposed that the commercial interests of Oklahoma and Arkansas unite themselves to make their demands more successful while there was great national concern over flood damages. He said that "Popgun appropriations" would not do, that Congress must realize that it would take \$25 million per year to develop the Arkansas. He noted that the decline in river traffic had resulted in the increase of freight rates from 23 cents a pound in the 1870's to 69 cents per pound in 1912.

Though there was a new awareness of the need for flood control it would be a mistake to assume the remedies were immediately obtained or even urgently pressed. In 1913 Congress appropriated only \$6 million for improvement of the entire lower Mississippi River and only \$48,000 for the improvement of the Arkansas. Both sums were pitifully inadequate. Another national flood in 1913, only somewhat less serious than the flood of 1912, served to confirm the need for legislation. It did not succeed in galvanizing Congress into major legislation.

In early 1914 there was apparent excitement over the prospect of relatively large Congressional appropriations to improve rivers, but the Newlands Bill as it was reported out of committee required that local communities put up more than half of the cost for the construction of protective levees, and a substantial portion of the funds for necessary revetment work. This disclosure was not too depressing since communities were accustomed to footing all the expense of levee work and considered the Newlands Bill an expensive concession.

Senator James P. Clark suggested that the appropriation would be more secure if river traffic showed more signs of vitality, so various communities along the Arkansas River began to promote a campaign to put more boats in the river. H. F. Auten, President of the Little Rock Packet Company explaining that the State had lost five woodworking factories because of excessive freight rates, urged businessmen to put their boats in the river and to use them. "The Government will not waste its money on a river that is not in use," he said. The Little Rock Board of Trade claimed to have received many letters indicating cooperation in the venture and campaigned to persuade the Senate to pass the Rivers and Harbors Bill.

The outbreak of War in Europe dashed any hope for Congressional support. Congress immediately cut \$18 million from the River and Harbors Bill as an "emergency war relief measure." The isolationist Senator Burton from Ohio, filibustered in vain against the cut.

As the war stretched into years, however, it would prove to be a catalyst for river development rather than an impediment. Regardless of the poor condition of the rivers for navigation, more and more traffic was carried on the rivers. Railroad car shortages had become acute. The astonishing amount of cargo transported on unimproved rivers made most Congressmen aware of river potential. Local organizations redoubled their efforts to get more traffic on the river while they had the initiative. In the space of a week, the Little Rock Chamber of Commerce secured pledges for 10,000 tons of cargo to be shipped annually if the Corps would improve the Arkansas, and within a few days the tonnage pledges had risen to 18,000 tons annually. The meetings of the Board of Engineers were attended diligently by all concerned parties.

As though to refocus attention on the need for river control, another serious flood swept the Mississippi Valley

in 1916 at the same time the flood waters were trying to drain out of the Arkansas Valley. The result was disastrous flooding, submerging the lowlands of Lincoln, Desha, Drew, Chicot, and Ashley Counties in Arkansas. The levee at the state prison farm broke, and the prisoners were evacuated. Flooding on the upper part of the river was also wide spread with refugees from the bottom lands in Oklahoma taking refuge at Fort Smith.

In 1917 Congress enacted what the Corps considers the first major flood control legislation, when it authorized an appropriation of \$45 million for the execution of plans of the Mississippi River Commission for control of floods. The funds were put at the disposal of the Secretary of War, and were to be expended only as approved by the Corps of Engineers. It was expected that the money would be used to provide for construction of levees in the Mississippi Valley. The substantial supporting vote for the bill, 40-15, belied the difficulty with which its supporters had dealt in getting its passage. Many prominent Senators, including Robert M. LaFollette and William E. Borah, had voted against the bill. Senator King shouted that the idea of making waterways navigable was "iniquitous beyond expression," while Senator Borah reversed an earlier position by pleading for the conservation of funds for the war effort.

In something akin to a mood of optimism, the Corps of Engineers announced that a complete survey of the Arkansas River would be undertaken as a preliminary measure toward a river improvement program. The work was to be done under the direction of Henry Fox, United States Assistant Engineer. At the same time, Senator Joe T. Robinson was informed that the War Department was officially abandoning further improvements on the White River. In the Department's estimation, navigational benefits were insufficient to justify the cost of more improvements. The Corps would continue to maintain the three existing locks and dams, even though the rotting timbers of the locks were leaking. The pools could only be operated below normal levels.

No major Corps activities were begun in the Little Rock District during World War I, yet if the participation of the United States in the War had dragged on for any sustained length of time such work would probably have received urgent priority. As it was, the national interest in river improvement died as soon as hostilities ceased. Warren Harding campaigned on a program of "Back to Normalcy." The unfortunately normal moribund and waning state of river commerce was reassumed. Regardless of efforts of river-town Chambers of Commerce, the Government withdrew its support for further river improvements. Once again the Little Rock District funds were restricted to only necessary snagging.

The new policy of withdrawal and retrenchment caused the Little Rock District's functions to be moved to Memphis April 27, 1921.

## Six Interim Years

Abolishing the Little Rock District as an independent district in 1921 had little local effect because the reduction of Corps activities has already been decreed. The Chief of Engineers, Major General Lansing H. Beach, explained that the characteristics of the Arkansas River were such that the only way to derive real benefit from the river was through expensive continuous revetment and contraction works, and dredging. River traffic that existed did not warrant investments for a massive program. He conceded that snagging operations should be sufficient to maintain barge traffic at its existing levels.

Even flood control, except as associated with hydroelectric facilities, was an area of responsibility that the Federal Government was turning back to local citizens. Local Levee Boards, financed by its citizens, tried to assume the burden of maintaining levees, but of course most citizens did not concern themselves with the levees except during times of flood. During an emergency the State resumed its contribution of convict labor, and most citizens preferred to rely on emergency procedures to handle emergencies. Also as a result of past experiences communities assumed that the Federal Government, through the Corps of Engineers, would step in during critical situations. This confidence was not misplaced. During the flood in the Memphis-Vicksburg District in 1922 the War Department contributed 5 million sand bags as well as tents and other supplies.

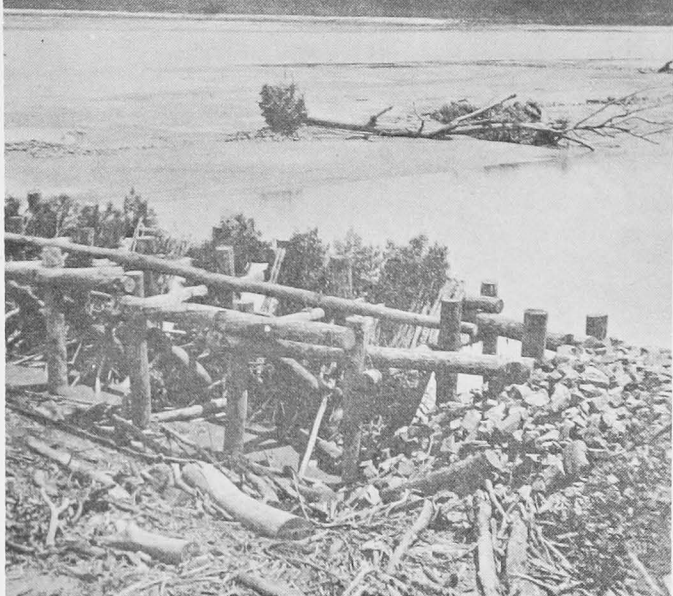
Since the Corps of Engineers maintained control of rivers deemed navigable, it continued to exercise its responsibility on the Arkansas, White, Black, Current, Red, St. Francis, and L'Anguille Rivers within the present day District. Among the unusual problems which the Engineers faced and solved in 1922, was the sudden growth of algae in the Arkansas River. The water of the Arkansas had become too clear, promoting the growth of algae which was normally inhibited by muddy water. The Corps handled the

problem by putting bleaches in the river.

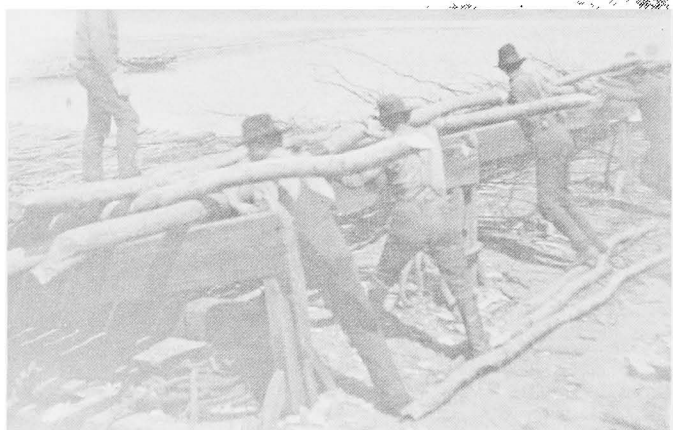
Another problem arose in 1923, when a 23,000-gallon vinegar storage vat burst at Little Rock. The entire quantity gushed into the streets and ditches and most of it made its way into the River with immediate effects on fishlife. The Engineers counteracted the vinegar by dumping chemicals in the river which both preserved the usefulness of the city's drinking water supply and the lives of the fish.

In the 1920's the first major interest was stirred in harnessing the Arkansas rivers to produce hydroelectric power. In 1922 the Caddo Power and Electric Company petitioned the U. S. Water Power Commission to build hydroelectric dams across the Ouachita and Caddo Rivers. In the very next year, the Dixie Power Company announced that it was preparing to construct three dams in the Ozark region; one on the White, one on the North Fork, and one on the Buffalo. Such visionary projects were a foretaste of things to come. The planners saw the dams as a multi-purpose asset to the area — hydroelectric power, flood control, and recreational use of the reservoirs — all things that have come to pass only in recent years. These ambitious projects were beyond the capabilities of private enterprise in an area of chronic impoverishment, yet it was the enlightened leadership of progressive men and companies that eventually succeeded in bringing these improvements to the area. As early as 1924, Arkansas' first major water power project was completed — the Rammel hydroelectric dam.

Government interest in control of hydroelectric facilities had finally been resolved after two decades of controversy. The Federal Water Power Act of 1920 broke the power deadlock which had existed since 1901, when great technological advances in power and power transmission had made practicable a complex system of power distribution. The interim struggle had all but stopped water power



**Pile and stonefill dikes along the Arkansas River near Lower Greathouse Bend at Little Rock. June 1900.**



**Willow mattresses being constructed in March 1900 were used to protect river banks from erosion.**

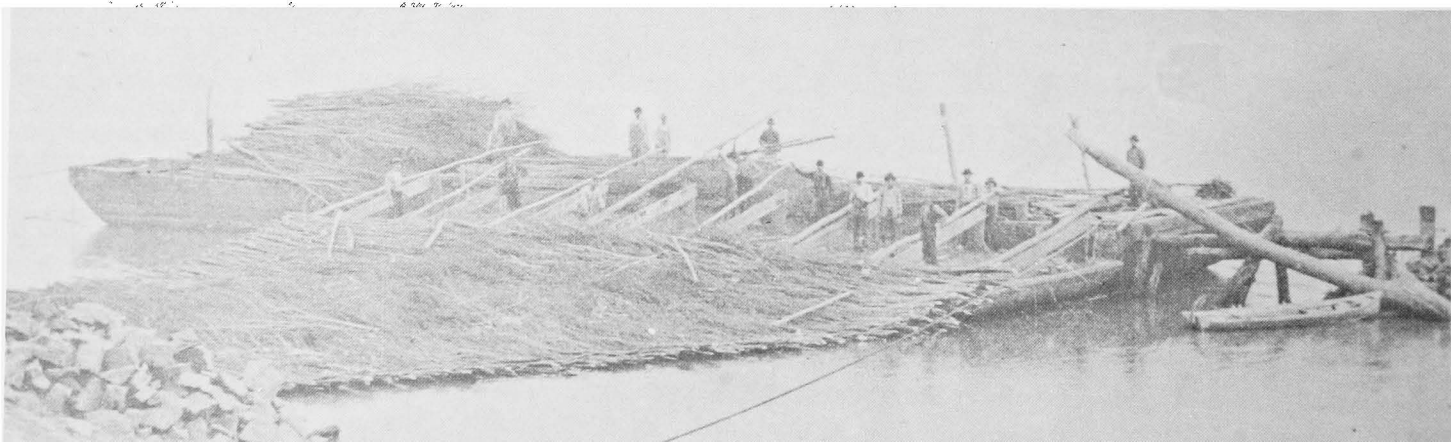
development in navigable rivers, but had irrevocably established the authority of the Federal Government to regulate the exploitation of water power. The Federal Water Power Act of 1920 established the Federal Power Commission, consisting of the Secretaries of War, Interior, and Agriculture. The Federal Power Commission was given exclusive authority to issue licenses for construction of hydroelectric facilities. In 1916 Senator Ransdell suggested a National Waterway Commission to be composed of the same three officeholders plus three civilian engineers. The proposal, made at the Rivers and Harbors Congress held in Washington in that year, had received serious consideration but was not acted on at the time.

In 1924 the Memphis District Engineer reported that commerce on the Arkansas River was at an all time low, with lumber operations accounting for 95 percent of the traffic. Further, he said that it appeared the only other group deriving any benefit from the continuing river maintenance were those employed in that (river maintenance) work.

How much land was caving into the river and being swept into the Mississippi delta? In the late 19th century the Corps of Engineers estimated that for every mile of river above Little Rock approximately 2 acres of land was sloughed off by the river. Below Little Rock the river claimed even more, an astounding 8 acres of land per mile of river. Of course there had been attempts to stabilize a bank at specific areas, as where the river was eroding into a city as at Pine Bluff. Also, banks were stabilized where bridges, trestles, dams, and harbors required that the river remain in a predetermined channel. It was a new trend for the Corps to think of protecting less vital areas by bank stabilization methods.

Bank stabilization was a developing science. Employees of the former Little Rock District worked on mats made of woven willow trees and branches. B. M. Huddleston of Mountain Home, who had begun to work for the Corps in 1920, remembers cutting willows and weaving those willows into mats to be anchored to an unstable bank. He recalls that he and his partner had to pull a skiff some 2 or 3 miles upstream to find a willow grove, cut them, and haul them back. They were being paid only for the actual time

**Willow mattress is laid on the Arkansas River at Little Rock in 1900.**



they spent in the cutting. Weaving of willows was an art, he said, and one in which both hands and clothes would take a tremendous punishment. The matt joints were secured with wire, and the combination of wire, splinters, heat, humidity, and mosquitoes made one confident that he had earned his \$60 per month (\$90 base pay, less \$30 for subsistence).

The men lived on the river in what was called a "quarter boat," usually a retired snag boat or tow boat that had been converted into a floating barracks. The old *A. D. Allen* was typical: Built in 1902, it was used as a snag boat until the 1920's, then converted into a quarter boat. It remained a quarter boat until the late 1930's. Superstructures of quarter boats, especially the living quarters, were constructed as a unit so that when old hulls rotted the superstructures could be unfastened and lifted onto other usable hulls.

The willow matts worked for surprisingly long periods. Once the woven matts were anchored to an endangered

bank and dirt and other fill materials were thrown over the matts, nature took its course to cause other trees and saplings to grow up through the matts anchoring them more firmly. If nature permitted the matt to stay in place long enough for growth to "take root," it performed its function for years and even decades. When R. L. "Shorty" Baird first started to work in the Memphis District for the Corps in 1929, his crew dug up a mattress at Helena. The matt had been placed there in the late 1800's, and was still well preserved and still functioning as originally intended. The key to the life of a mattress was its exposure to air; the more air exposure, the shorter the life of a willow matt.

Mattresses were also constructed with woven boards when willows were not available, but boards were more expensive and did not last as long even under ideal conditions.

The next development in bank stabilization following willow and board mattresses, were dikes and trenchfill revetments.

Driving pile on the Arkansas River at Lower Greathouse Bend near Little Rock, March 1900.



## The Flood of 1927

If the flood of 1912 can be considered an event which focused national attention on the problem of flood damages, then the disastrous flood of 1927 might be considered a retribution for the Nation's procrastination. Starting in January unusually heavy and constant rains began to swell the rivers of the entire Mississippi valley. By April the unrelenting rain had soaked 31 states and two Canadian provinces with downpours totalling 250 cubic miles of water—enough to cover the entire area with over a foot of water had it been spread evenly. Even after absorption and evaporation more than 60 cubic miles of water had to find its way to the Gulf. It was estimated that half of Arkansas was under water, with all the rivers having gone out of their banks and small streams becoming raging rivers. At Little Rock the Missouri Pacific Railroad placed 14 cars of rock ballast on its Baring Cross bridge to keep it weighted in place. The furious torrent swept away both bridge and cars.

By April 19 there were 3 feet of water in the North Little Rock business district. At Newark the entire business district was inundated and the light plant was shut down for several days until a sandbag dike was built around the engine so that water could be pumped out of the engine and generator room and power production be resumed. At Pine Bluff 500 persons were marooned on a bridge northeast of the city, while one woman within the group gave birth. Reports were that the people enlivened their spirits by singing the hymn, "Shall We Gather At the River." At Arkansas City the people were chagrined to find that while the levee held, the water from upstream poured into the town behind the levee raising the water level in town 4 feet higher than on the river side of the levee.

Further down the Mississippi, at Ferriday, Louisiana, the switchboard operator claimed that a porpoise swam into her office and put the board out of commission by splashing a stream of water on it.

Inland seas were formed over farm lands, and it was possible for sidewheelers to leave the river bed and steam boldly across flooded fields and even over inundated tree tops to rescue stranded men and animals. A herd of fat steers was seen struggling against the current while being carried down the Arkansas, only to disappear. Two mules, harnessed together, struggled to high ground.

Aside from the pathetic animals that were swept downstream, 50,000 dead animals had to be burned or buried after the waters subsided. Senator T. H. Caraway of Arkansas hinted that administrative skulduggery was partially responsible for the terrible losses, because, he said, Secretary Hoover had not followed the recommendations given by the Corps of Engineers to the Coolidge Administration.

The Federal Government responded as best it could to this overwhelming disaster. President Coolidge sent Secretary of Commerce Herbert Hoover to set up a special Flood Relief Headquarters at Memphis. With all railroads out of commission, most trestles and bridges out, and even communication largely disrupted, the Corps of Engineers was used in every possible way. Secretary Hoover organized a flotilla of 40 river steamboats to rescue men and animals, and 50 million grains of quinine were distributed in the seven-state area.

The Chief of Engineers, Major General Edgar Jadwin, established temporary headquarters in Memphis to work with Hoover as closely as possible, and in the situation advocated once again a system of flood control, not



1927 Flood of the Arkansas River poured waters into stores and homes on East Sixth Street in Little Rock.

merely temporary works which might or might not protect a small area. General Jadwin said that aside from the loss of life and property damage due to unusual floods, the Mississippi River, during each normal year, carried off about a cubic mile of rich top soil. This was equivalent to 3 inches of top soil from 13 million acres of land.

Formulating ideas which had been developing for some time, General Jadwin proposed a plan which took form in the Flood Control Act of 1928, an Act which became known as the "Jadwin Plan."

The Jadwin Plan, as implemented by the Flood Control Act of 1928, was a comprehensive plan of levee extension and augmentation along the Mississippi. This basic plan was extended to secondary rivers as a result of another great flood in 1936. Under the Jadwin Plan the Corps of Engineers was given the task of directing the flood control program along the Mississippi through the Mississippi River Commission. Local groups were asked to cooperate. With remarkable conservatism it was anticipated that the works would save the people involved some \$8 billion dollars, or a return of 5 dollars for every dollar invested.

Those who had been directly affected by the disaster of 1927 were determined to keep the issue before the public. The Pine Bluff Chamber of Commerce took the lead in organizing other municipal groups and interested farmers into the Arkansas River Basin Association. The Association immediately began to think in terms of a multipurpose project which would include navigation and hydro-electric development along with flood control. It was apparent even at this early date that those who were primarily interested in flood control would also have to think in these expanded terms in order to gain national support.

The White and Black River Valley Flood Control Association held a mass meeting in Memphis to try and get a compromise program of Federal aid initiated. Among the more prominent people at this meeting were John Morrow, Sr., of Batesville and Douglas E. ("Dean") McClure, who was the Secretary of the Association, a salesman for the Oliver Supply Company, and a silver-tongued orator.

Morrow made a good representative because he was typical of those farmers who had been hit most disastrously. Of the thousands of acres of bottom lands farmed by Morrow, less than 1 acre escaped inundation in the flood of 1927. Morrow and many other people believed that the White River held much more potential for navigation and power than did any other river in Arkansas, including the Arkansas. They would point out that the average fall in the river, from its source to Newport, Arkansas, was about 4 feet per mile, but the fall from Newport to the mouth of the White was only about .4 of a foot per mile. It could be easily argued that the upper portions of the river were ideally suited to hydroelectric production and water conservation while performing critical flood control operations, while the lower part of the White could still be utilized for navigation.

The immediate problem, however, was not hydroelectric power and navigation, but flood control. In arguing the need for some kind of comprehensive, Federal Flood Control program for the White River Valley, Morrow and McClure pointed out that the farmers who sustained financial disaster during the flood of 1927 were in no position to underwrite the cost of flood control, even in part. The farmers had no credit and no money, and if the Government could not guarantee adequate flood control over 90 percent would have to abandon their farms and homes within a six-month period.

The Association's plan and recommendation revolved around the construction of a series of dams at the foothills of the Ozarks, indicating a true appreciation of the source of their flooding problems. The railroad interests which had also absorbed fantastic losses were also present at the Memphis meeting, and were quick to second the proposal. Major F. B. Wilby, the U. S. District Engineer, officially noted the practicality of the plan, but told the press that anyone who advocated control of floods by upstream methods, as opposed to downstream (levee) control was a "damn fool."

At a similar meeting held by the Arkansas River Flood Control Association, at Little Rock it was brought out that losses from the flood of 1927, on the Arkansas River alone, would exceed \$43 million, exclusive of the millions lost by the three major railroads in Arkansas. All levees between Fort Smith and Little Rock had been breached.

The 1920's ended on something of a vague note of optimism. In his report for 1929 the District Engineer could only hope that some meaningful activity would be undertaken on the rivers in Arkansas in the future. There were national interests and promises of serious consideration of multipurpose projects. The note of optimism collapsed with the financial collapse of the stock market in October of 1929. As the nation staggered under heavy financial losses, the goal of flood control suddenly seemed less important. Thirty billion dollars were lost on the market in 3 weeks. This man-made disaster seemed to have washed the national vitality out to sea as surely as the mighty Mississippi had washed the nation's topsoil out to sea in 1927. The most urgent national need became economic controls — not flood controls.

The mid-depression years were marked by two new developments: the initiation of litigation from private property claims arising as the result of Corps activities, and Presidential advocacy of river and harbor work as an unemployment relief measure.

In September of 1931 the Mississippi River Flood Control Association noted that the Jadwin plan had resulted in the loss of considerable amounts of private property as the levees had been set back in some instances and in others the newly constructed levees were containing backwater thus rendering certain lands useless. The Association proposed a plan of owner-compensation, plus Federal reim-

bursment of funds expended by local levee boards in repairing damage caused by the flood of 1927.

Compounding the problem of private property vs. public interest was the controversy over the fuse plug levee vs. the controlled spillway. In the first instance the levee would be so designed that if the entire levee or a critically important portion of the levee was about to give way, then a lesser important part would give way instead and thus relieve the pressure in the critical area. The controlled spillway is actually little more than a sophisticated version of the fuse plug levee. A levee is constructed with flood gates that can be opened to relieve pressure into an area where the river will cause less damage. One was less costly to construct, but was a little more capricious and involved repairs once used. The other was considerably more expensive to construct initially, but was more dependable and ordinarily needed no repairs.

The property claims worked their way up through the courts until finally the United States Supreme Court agreed to hear the so-called "Kincaid case," from Monroe, Louisiana. A Federal District Court in Louisiana and a Circuit Court of Appeals in New Orleans had ruled that the Government could not take land for floodways without compensation, and questioned the legality of the Jadwin Plan. The Jadwin Plan, as previously mentioned, had incorporated some private land in its program, but made no provision for compensation to the owners of such land. The Government was authorized to pay only for the land used in the actual construction of levees. In a surprise move, it was the Corps of Engineers which requested the Supreme Court to hear the case after the lower courts had ruled in favor of the landowners and the decision had been sustained in the appeals court.

In February, 1932, the Supreme Court reversed the decision of the "Kincaid Case," saying that landowners could not claim damages merely because their land might be flooded. The court did hold, however, that damages could be awarded once the property had been affected, and at the same time the Court said that owners of land in certain specified major spillways could sue and claim damages on the basis of condemnation. The distinction made by the court was made on the basis of whether land might be affected only occasionally, or whether there was a more constant threat.

The effect of the court decision was to end the controversy over fuse plug vs. controlled spillway by bringing a halt to work on all spillways. Money was not available to purchase the thousands of acres of land which might be affected by spillway functionings.

To clarify the problems of compensations and legal responsibility, the Mississippi River Flood Control Association sought a Federal Bill which would provide compensation for flowage rights and at the same time require that all floodways be well defined and confined.

The House Flood Control Committee unanimously adopt-

ed a resolution authorizing the Corps of Engineers to review the Jadwin Plan, and agreed on a measure authorizing the Federal Government to pay for the expense of setting back, extending, or relocating levees along the Mississippi River. Local levee districts would still be assessed with the responsibility for the rights of way of the levees. The issue of floodway compensation was bypassed for the moment.

The second major development of the mid-depression years involved a rather astounding concession from President Hoover. The President was a staunch believer in national strength and "rugged individualism," and as such he was confident that the nation would work itself out of the depression into which it had fallen. However, as the depression wore on President Hoover came to accept some premises that were totally new to the Presidency and more often credited to the later "New Deal" administration of his successor, Franklin Delano Roosevelt, i.e., the concept that the Federal Government could and should create jobs to help ease the disastrous unemployment situation.

Historically this concept had been around for some time, going back to the Granger, Populist, and Progressive movements, but no one could have ventured a prediction that it would be Herbert Hoover who would be left to the actual execution of such concepts. It was.

In March of 1932, President Hoover made a personal appeal to Congress to pass a bill appropriating over \$52 million for river and harbor work, specifically designated as a measure to give partial relief to the unemployment situation. In the following year the President made an appeal for an additional bill appropriating \$60 million. These measures were effective within their financial limitations, but of course they were insufficient to have a great impact on the national economy. President Hoover could not bring himself to force people to comply with his programs, as Roosevelt would do later, consequently Hoover's program relying on voluntary compliance could not be as effective as that of his successor.

Optimistic "Whistling-in-the-dark" continued during the depression years. The Mississippi Valley Association continued to promote the idea of an inland waterways development while railroads opposed the idea. At a meeting of the Lower Mississippi Division of the Mississippi Valley Association, former Congressman Cleveland A. Newton, later an attorney for the Association, denounced railroad opposition, saying that water development should spur industrial growth and bring greater prosperity to both rail and water commerce. M. J. Sanders, the Director of the Association, condemned Congress for never having adopted "any intelligent, constructive policy" on river improvement. William R. Dawes, President of the Association, tried to bring all transportation agencies into a united effort to achieve such a measure, but to no avail.

Colonel Clarence B. Douglas, past President of the Arkansas River Association foresaw barge traffic on the



1927 Flood of the Arkansas River covered Main Street of Gillette, Arkansas. Gauge was 28.9 feet on April 27.

Arkansas "from its mouth to Tulsa," and cannot now be criticized too severely if the goal was not reached in 5 years, as he expected. John R. Fox, field secretary of the Mississippi Valley Association, also foresaw the development of the Arkansas River into a navigable stream within 5 years of 1931, but he erred greatly in estimating the total cost of the project at no more than \$40 million.

Businessmen from the Arkansas port cities made periodic trips on the Arkansas to reassure themselves that the river had not lost its commercial viability. These men would report on the poor condition of the dikes and the possible disasters that would result from continued neglect. In one such inspection trip, John R. Fordyce noted that some of the dikes were originally built in 1895 and warned that if the dikes should fail in the next flood "the great river would squirm like a fireman's hose."

The Governor was sometimes prevailed upon to send telegrams to the Chief of Engineers asking for a personal inspection visit. During one inspection visit the point was

well made when the inspecting engineer was stranded on a sandbar while inspecting the dikes and revetments near Little Rock.

In about 1934 Representatives David D. Terry and John E. Miller began to promote the idea of an Arkansas Valley Authority, similar to the TVA. Congressman Terry's plan did not emphasize navigation on the Arkansas at first, but rather emphasized flood control and hydroelectric power on the White River. In February of 1934 Congressman Miller introduced such a bill in Congress but the bill got nowhere. Miller and Terry continued to fight for funds to develop the White and Arkansas Rivers, but Senator Joseph T. Robinson seemed to be more concerned about construction of spillways. Once again uncontrolled or controlled spillways became an issue. Senator Robinson rejected both the Jadwin Plan (uncontrolled flood way) and the Ferguson Plan (controlled spillways) and supported instead the so-called Markham Plan, which would have provided for a series of cutoffs in the river.

Proponents of an Arkansas River Navigation Program received a rather serious blow in 1934 when the Mississippi Valley Commission of the PWA filed a report which concluded that there was no need for navigation improvements in the area because river commerce had dropped to 600 tons of traffic in the lower river. Simultaneously the report held that there was very little need for development of hydroelectric power in the area.

The Report brought immediate protests from all concerned people. The editor of the Arkansas Gazette said that the report of the Commission could not be taken as a final word because the Commission had not made an exhaustive study and because the future of water transportation was too vital to be so lightly dismissed.

As if outraged by the cavalier dismissal of its importance the Arkansas River began to swell ominously under pressure of a 3-day rain in March 1935 in northern and western Arkansas. Soon all streams and most of the rivers were out of their banks. The White, Black, Current, Little Red, Fourche, and St. Francis, as well as the Arkansas, turned into fluid battering rams smashing everything in their paths. Railroad bridges were again washed out, traffic suspended in most areas, and telephone lines knocked down. For a while it was feared that this flood would equal or surpass the disaster of 1927: water was 12 feet above the Forsythe (Missouri) dam on the White River; the suspension bridge over the Little Red River at Higden, Arkansas, was washed out; boats were sent out to rescue people marooned in their homes at such diverse locations as Poplar Bluff, Missouri, and Clinton, Arkansas, a CCC company at Crowley's Ridge camp, west of Paragould worked desperately to reinforce the St. Francis River levee, but became stranded when the levee gave way; Batesville employees of the Arkansas Light and Power Company made a heroic rescue of a family of five marooned on a White River island within sight of the city.

The Red Cross, the National Guard, and the Corps of Engineers responded to the emergency. Major W. M. Hoge, the U. S. District Engineer at Memphis, announced that the crest had passed without quite reaching the dimensions of the 1927 flood. Even so, the Red Cross announced later that almost 4,000 families had been forced from their homes.

While the various river and flood control associations redoubled their efforts to obtain favorable legislation, a new association was formed at Little Rock to get permanent flood control, and to provide water power, navigation, and irrigation. The organization, called the Arkansas Valley Association, immediately dispatched telegrams to members of the Arkansas Congressional delegation urging them to bring House Document 308 to the Flood Control Committee. This all-important document was the keystone for the whole system of Arkansas River flood control. Through its spokesman, Fred A. Isgrig, an Arkansas plantation owner, the Arkansas Valley Association strongly urged that a

Little Rock Office of the Corps of Engineers be reestablished. The Association, with Little Rock Mayor Overman as president and William Parkin, retired engineer of the Memphis District as secretary, provided coordination to the various organizations trying to promote the goals of navigation, hydroelectric power, and flood control.

By mid-1935 the nation was regaining some of its lost confidence along with a fair start on economic restoration. The New Deal programs of Franklin Roosevelt were taking effect, and Congress was inclined to do those things which would put men to work on worthwhile objectives. The climate was right for consideration of House Document 308. Furthermore, the Memphis District was at that time under the direction of Lieutenant Colonel Eugene Reybold, a man who could appreciate the consolidating effect of a comprehensive program of flood control, hydroelectric power, and navigation, and a man who realized that massive programs would necessitate the restoration of the Little Rock District. By mid-1935 the Memphis District was already becoming ponderous with the expansion of Corps activities and personnel. There were 131 engineers and related professional, 734 semitechnical employees (inspectors and clerical workers), 1,000 skilled laborers, and 850 unskilled laborers on the Memphis District payroll, without bringing in new and extensive projects. There was some overlapping of duties between the Corps of Engineers and the Mississippi River Commission in the matters of flood control and navigation. The situation was not chaotic as the President of the Mississippi River Commission, General Harley B. Ferguson, was also the Division Engineer. Colonel Reybold and General Ferguson agreed that in the interests of efficiency of operations—especially if House Document 308 were made into law and the activities were initiated—the Memphis District would have to be subdivided. The Arkansas Valley Association, which had the adoption of Report 308 as its goal, took on the related goal of securing at least a field office in Little Rock.

Although navigation was deemed important, and hydroelectric power considered worthwhile, it was flood control which occupied the center of the stage more often than not, as the existence of so many flood control associations would testify. Even individuals were prone to propose flood control measures. John R. Fordyce, the civil engineer from Hot Springs, suggested that a dam be built from Country Club ridge to Big Rock Mountain across the Arkansas River to protect Little Rock and North Little Rock from floods. A Colonel Walter E. Winn objected strongly to Fordyce's plan, telling Congressman Terry that such a dam would "wipe out Levy, North Little Rock, Little Rock, and most of the southwest part of Pulaski County."

Colonel Winn, as an alternative, proposed a levee system composed of five miles of earth levee on the north bank, and four miles on the south bank. Colonel Winn, as

certain other prominent people, did not believe that flood control through upstream methods was practical. He did believe, however, that small dams could be built on small streams or rivers for the purposes of power, irrigation, and recreation.

By June of 1935 the Arkansas Valley Association had come to an interesting compromise with the Government. The city of North Little Rock agreed to furnish surveyors to lay out proposed levees on the north bank in the vicinity of the old Rock Island roundhouse to Big Rock, and to protect the Lincoln Avenue area. The 154th Observation squadron of the Arkansas National Guard agreed to provide aerial photos, and preliminary engineering work was to be initiated by a group of engineers from the Memphis District, with Captain H. Kramer in charge. Colonel Reybold, the Memphis District Engineer, explained that no funds had been authorized for construction of such works, but intimated that funds might be obtained through a Works Progress Administration (WPA) program. The urgency of the situation stemmed from the belief that the Arkansas River was about to revert to its old river bed along the Rock Island tracks on the north side of the river, a situation which the Corps of Engineers denied but could not guarantee to the satisfaction of the citizens of the area. The WPA did appropriate \$750,000 to help repair the levees and dikes which were destroyed or damaged in the recent flood, and the reinforced levees brought peace of mind to the citizens.

In the meantime Congress was still considering the 308 Report. It reached the House as H.R. 345 and provided for authorization of \$62,415,000 to be spent on systems of dams, reservoirs, and other flood control projects on the Arkansas, White, and St. Francis Rivers. The total bill called for an expenditure of some \$125,000,000 in a six-state area, with the area of the Little Rock District receiving almost half of the appropriation. Mayor Overman of Little Rock, in his dual capacities as Mayor and as President of the Arkansas Valley Association, called for the public to pressure Congress to pass the Bill. John A. Fox, field representative for the Mississippi Valley Commission, told the Arkansas Gazette he was astounded at "public indifference over the proposed appropriation." He said that he found no enthusiasm at such places as Dardanelle, Clarksville, and Morrilton, where improvements were planned, or even at Blue Mountain and Nimrod where reservoirs were planned.

Mr. Fox may have overstated this indifference in an attempt to arouse more expressions of public support.

While Congress pondered the Bill, Mayor Overman of Little Rock, as the President of AVA, asked the Arkansas legislature to consider forming a four-state compact with Missouri, Oklahoma, and Kansas, which would proceed if necessary, with an Arkansas River improvement program of its own. Mayor Overman hoped the Federal Government would be more likely to act if the states made a show of enthusiasm and initiative.

Greater Federal interest and promotion came in 1936 when the basic Flood Control Act of 1928 was extended to include the entire nation, and the navigation mission remained the responsibility of the Corps of Engineers. For the first time levee construction and maintenance, as well as flood control and channel clearing, was to be the burden of the Federal Government rather than the joint burden of the local citizens assisted by the Government.

Local efforts had been prohibitively expensive to already depressed citizens, and the benefits had been too often temporary or even negligible. The uncoordinated efforts of several communities could and did tend to cancel each other, or aggravate conditions downstream. With the Corps of Engineers as the planning, coordinating, and engineering agency, whatever improvements undertaken in the future considered basin-wide general effects rather than local interests only.

Legislation alone, however, was not sufficient to control the rivers. Once again in 1937 the Mississippi River went on a rampage and flood water backed up into eastern Arkansas creating another disaster. In January and February the river crested, driving people out of their homes and villages, forcing livestock to swim for higher ground, and bringing out the Red Cross, the Corp of Engineers, and other Army elements. Some described the disaster as "the greatest crisis in the history of the Mississippi Valley." Visiting dignitaries arrived to inspect the damages. WPA Administrator Harry Hopkins toured the flooded area, accompanied by Major General E. M. Markham, Chief of Engineers.

The supporters of flood control lost no time in demanding flood control action; Senator Bennett Champ Clark of Missouri met with flood control advocates at St. Louis and condemned the existing methods of handling flood problems as "a national folly," while charging Congress with seeking only "token solutions" to very grave problems. At the same time a Dr. J. Russell Smith was writing an article entitled "Plan or Perish," in which he concurred that the flood of 1937 had once again demonstrated the need for new and more comprehensive plans of flood control. Dr. Smith went beyond the other cities in asking flood control responsibilities be placed in the hands of civilians, rather than the Corps of Engineers, as he professed to see a possible conflict of interest between the civilian and the military. Though the fears of Dr. Smith never came to pass, he expressed the apprehension of the period.

The flood of 1937 also revealed that the Memphis District, reaching to the eastern slope of the Rocky Mountains, was too vast to properly dispatch its greatly increased scope of responsibilities. The Corps of Engineers reactivated the Little Rock District. As reorganized, the area taken from the Memphis District included the Red River Basin above Fulton, Arkansas, the Arkansas River Basin above Pine Bluff, and the White River Basin above George-



**Floodwall at North Little Rock on the Arkansas River.**

town, Arkansas. The boundaries of the re-created District were larger than those of the original District, and its new responsibilities were greater.

The Little Rock District included the watershed of the Arkansas River from Pine Bluff to the Rocky Mountains. It extended into Oklahoma, Texas, Kansas, Colorado, and Missouri as well as Arkansas. The immediate projects were not nearly so complex or massive as they were to become, nor for that matter was the concept of Corps responsibility.

The District Engineer for the reestablished District was Lieutenant Colonel Stanley L. Scott, who assumed command of those projects of the Memphis District which were within the boundaries of the Little Rock District. The bulk of the inherited operations were snagging, dredging, and minor repair work. The only "permanent" projects on the Arkansas were the works at Little Rock and Pine Bluff.

A handful of employees arrived in Little Rock in the spring and summer of 1937. The original employees who opened up the new District in the temporary quarters at Second and Scott Streets, in Little Rock, were Miss Dora Pasink, Earl R. Martin and his wife, Roberta, H. C. West, E. D. Blakney, W. H. Esslinger, and Dewey Pierce. As late as 1968 three of the original seven were still active in the District Office, but with the retirement of Miss Pasink, in 1968, and the death of West in March of 1969, only Earl Martin remained as the last of the original group, as the Purchasing Agent for the District Office.



River support groups like the Arkansas Valley Association kept needed flood controls, navigation and hydroelectric power plans before Congress.

The temporary quarters were located three flights up in the old Board of Trade building. The District's first Executive Officer, Captain Lester Rhodes, a West Point graduate, had preceded the arrival of his staff by only a few days, but the District had arranged for the remodeling of the old Gay Company building on Third and Broadway, and within a few weeks the offices were transferred to the Gay Building. The District remained headquartered at the Gay Building until the present structure, the new Federal Building, was built some 34 years later.

Mr. H. G. Bozarth transferred to the Little Rock District from Tucumcari, New Mexico, arriving only 7 days after the original group had set up office. As Personnel Officer, Mr. Bozarth would see the number of employees surge from approximately 15 at the time he arrived, to some 6,000 people during World War II.

Most of the early employees were selected people who were transferred from other Corps Districts to give the Little Rock District a cadre of experienced personnel.

Among the other early arrivals in the District were: Kathrine B. Simmons, junior stenographer, who arrived on July 13, 1937; Claude E. Mayo, surveyman, who arrived on July 16; and Thelma S. Townes, under clerk, who arrived on July 20th. These twelve mentioned people, plus 140 others, faced the immediate task of moving and establishing the new District.

Among the first tasks facing the District Engineer was to get under construction some sorely needed projects, work which the 1937 flood had made all the more obvious. As to be expected, levees were first on the list, but there was also the construction of floodwalls.

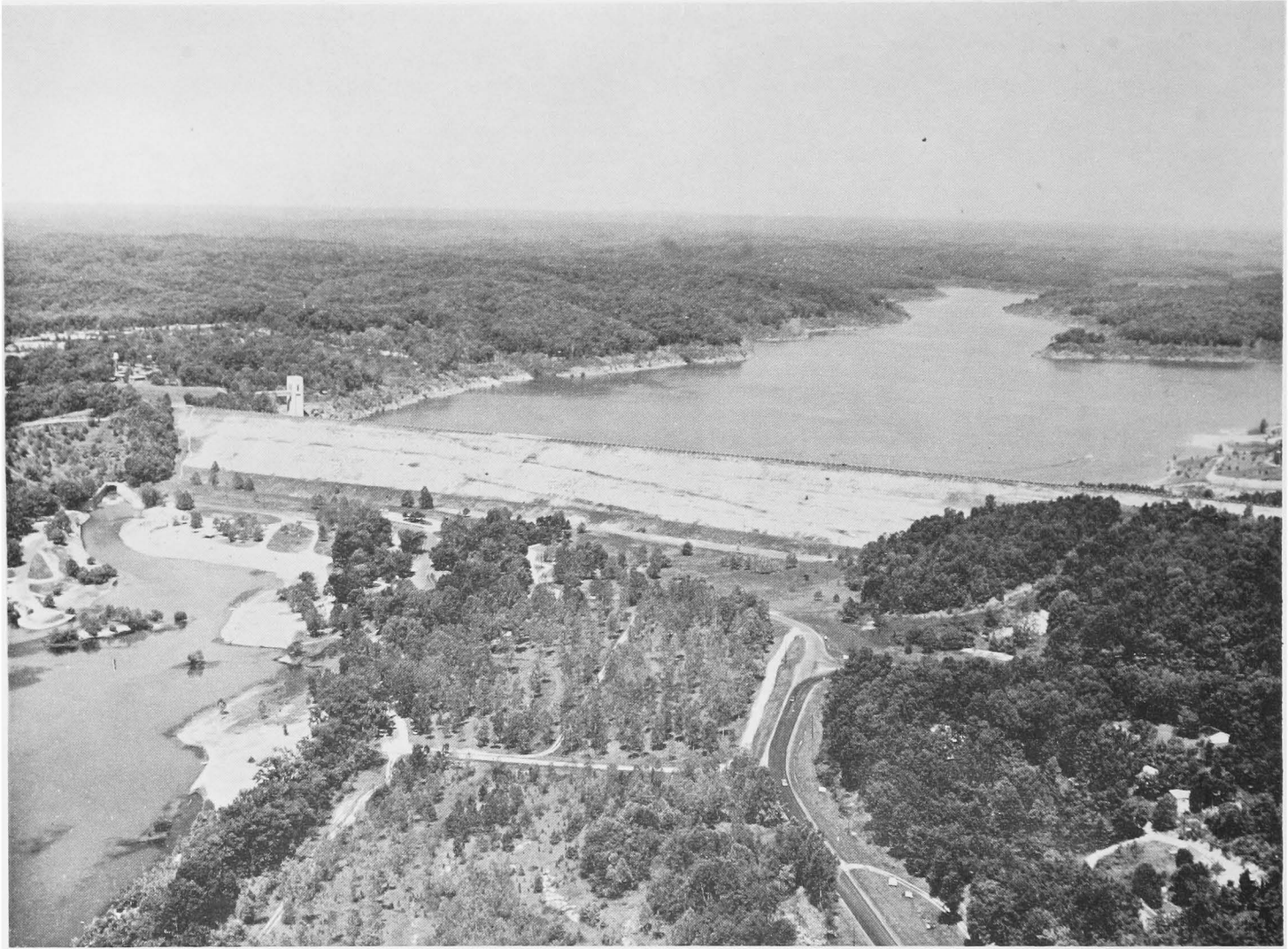
The floodwall projects, particularly for North Little Rock and Newport, constituted the first new projects of this type for the Little Rock District, but from its very inception the District looked to the authorization and implementation of the Jadwin Plan of levees to extend into the District and the projects outlined in the famous 308 Report. The 308 Report had not recommended any projects for construction but it served to present a powerful set of facts and figures to Congress to prove the need for a comprehensive system of flood control, navigation, power, and irrigation for the Arkansas River, the White River, and their tributaries.

The Report had noted that the total drainage area of the Arkansas was an awesome 160,500 square miles—12.8 percent of the entire Mississippi watershed. The Arkansas River flowed some 1,450 miles from its sources in the Rocky Mountains to the Mississippi, and in its uncontrolled state the river runoff at Little Rock fluctuated from less than 1,000 cubic feet per second to as great as 830,000 cubic feet per second.

The Chief of Engineers, Major General E. M. Markham, transmitted information compiled by the District Engineer, citing prospective tonnage and revenue savings which would accrue from the construction of a 9-foot channel.



Sailing is one of the many activities enjoyed by visitors at well-maintained District lakes.



**Clearwater Dam on the Black River near Piedmont, Missouri.**

## Clearwater, Nimrod and Blue Mountain Dams

The Flood Control Act of 1938 authorized the construction of Clearwater Dam on the Black River, southwest of Piedmont, Missouri; Nimrod Dam on the Fourche La Fave River, near Ola, Arkansas; and Blue Mountain Dam on the Petit Jean River, near Waveland, Arkansas. In 1940 preliminary work had begun at all three sites. Land appraisals and acquisitions of right of way proceeded according to plan in these areas.

The Clearwater Dam became a casualty of World War II, even though the project was clearly in construction when the war started. The dam was to be an earth-filled project, designed for flood control and recreational purposes alone, and as such did not warrant a national pri-

ority rating. Still, by 1942 work had proceeded to the point that the concrete-lined tunnels, designed to carry the water to the outlet below the dam and the gate towers had been completed. The order to suspend operations for the duration carried with it instructions that the improvements were to be maintained so that the project could be resumed after the war. Following the war construction on the project was resumed and it was completed in September 1948.

The Clearwater Dam spans the valley for a length of 4,225 feet, with a maximum height of 154 feet above the streambed. Over 5,500,000 cubic yards of fill material went into the making of the dam. The reservoir had a total water storage capacity of 413,000 acre-feet.



Government Village, Clearwater Dam.



Relocated Chitwood Cemetery, Clearwater Dam.



Nimrod Dam on the Fourche La Fave River near Ola, Arkansas.

When World War II broke out, construction was already underway at the Nimrod site, and being a relatively small project, it was decided that the project should be completed. By 1942 concrete pours were finished and the project became operational as the waters slowly began to back up into the reservoir. In comparison to the major dams, it was a small project, with a height of only 97 feet above the streambed, and a conservation pool shoreline of only 77 miles, but it controls a drainage area of 680 square

miles above the dam, and contains a flood-control pool of 307,000 acre-feet. Also, aside from the usual fishing, swimming and boating activities, the normally unflooded areas of the flood control pool were set aside as a State duck area. Although the dam has been operational since 1942, construction of administrative buildings and general clean-up operations were not completed until after World War II.

The third of these three minor dams was, the Blue Mountain Dam on the Petit Jean where construction was



**Blue Mountain Dam on the Petit Jean River near Waveland, Arkansas.**

also halted by the war emergency. Like the Clearwater project, the Blue Mountain Dam was designed as an earthen structure with a concrete-lined tunnel for discharge of floodwaters. Construction started in 1940 and paralleled that of Clearwater Dam. By 1942 the outlet works and tunnel had been completed. Construction on this project was halted in 1943. Much work had been completed on the construction of the spillway and embankment, and acquisition of lands was well advanced. Maintenance of the unfinished project was also provided in the order to

suspend, consequently when the Blue Mountain project was resumed in 1946 it took but a few months to bring it to completion in June 1947. The dam was shorter and lower than the Clearwater Dam, being 2,800 feet long, with a maximum height of 115 feet above the streambed. Accordingly, the earth fill amounted to some 1,600,000 cubic yards, and the total water storage space in the reservoir pool was 258,000 acre-feet. During the 19 years between its completion and the statistical report of 1967, the dam had contained 134 floodflows in the Petit Jean River Basin.



Arkansas Post National Monument displays a stone taken from the ruins of an old bank building built at Arkansas Post in 1839.

## Surveying

Early survey crews had to drink for survival, if nothing else, for their survey work took them into the land of whiskey stills, a land of hostile suspicion and even sudden death, especially for strangers who worked for the Government and did not drink the characteristics of "Revenooers." Hostile farmers could and would become friendly, hospitable, and generous once they were convinced that survey crews were associated with the Corps of Engineers—not the Revenue Department. Every once in a while survey crews were likely to stumble upon a still. They were aware when a still was being tended, or at least being watched, thus they had to follow a careful and regular routine of shouting back and forth to make certain that farmers could hear them coming and be assured they were a survey crew. If no one appeared immediately when they uncovered a still, they sat nearby and talked loudly about how they wished they had a drink, or how they might have to drive back into town for a drink. Eventually, someone would usually come out of the brush, rifle or shotgun in hand, and offer them a drink. On one occasion a member of a crew was captured, stripped, and "near hung" until the natives decided to take him back to camp to confirm that he really was with the Corps of Engineers.

One of the many problems encountered in surveying is to discover an original survey to be in error, making every piece of land in the vicinity improperly described. One old survey showed the North Fork of the White River to flow up over the top of a 300-foot bluff, travel for about a mile and a half in a southeasterly direction, make a U-turn, come back over the bluff, and reenter its normal course. Obviously a good portion of the county had improper land descriptions based on this survey. Normally it would have taken about 3 years to rectify the confusion, but Norfolk Dam had been placed on a priority list because of war time (World War II) needs. The situation had to be settled immediately so that the basin could be cleared for the reservoir that would soon begin filling.

The Little Rock District made an accurate resurvey and had a hearing in the U. S. District Court at Harrison, Arkansas, where landowners testified as to what land was theirs. Having established proper ownership of the land, the Corps of Engineers purchased the basin land and soon it was under 200 feet of water.

Similar problems of ownership erupt when rivers meander and change courses, requiring resurveys before bank stabilization work can begin.

# The World War II Years

In 1938 the Little Rock District was handed its most ambitious and comprehensive task in the authorization of the Flood Control Act of that year. This Act authorized a comprehensive system of dams and reservoirs, primarily in the White River drainage basin. A total of six dams was authorized in the original Act, all to be primarily for flood control but many to be so constructed that hydroelectric features could be added later. This large program was just getting underway when the United States entered World War II, nevertheless some elements of the system were completed. The expansion of the Corps of Engineers' capabilities in preparation for this task placed the District in position to prosecute its wartime activities.

By 1941 the Little Rock District had expanded its personnel to about 900, and its facilities took up the entire Gay Building, three floors of the Professional Building, a Mapping Section at 307-09 Broadway, and a warehouse at Fourth and Spring Streets, in Little Rock.

In 1940 the District had begun preliminary work on the Clearwater Reservoir on the Black River near Piedmont, Missouri. After land appraisals and acquisitions of right-of-way were underway, heavy excavation work was done, and foundation explorations were being carried on, beginning in May.

In the same year the temporary construction buildings and shops were largely completed for the Blue Mountain Dam and Reservoir on the Petit Jean River near Waveland, Arkansas, and for the Nimrod Dam and Reservoir on the Fourche La Pave River near Plainview and Ola, Arkansas. In addition, clearing and excavation work was also in progress at Nimrod, with construction estimated at 2 percent at the end of 1940. At Norfork, plans for the construction office and shop were substantially completed along with the dam access road and the construction railroad. While no construction was actually started, the preparations for the construction plans and specifications were estimated at 60 percent complete.

Mapping, surveying, foundation exploration, and the compilation of land ownership data were carried on as

part of the operations for flood control in the White River Basin, but snagging and dredging operations dominated improvements on the White River in 1940. The usual levee and drainage work proceeded throughout the District, but the emphasis and central interest lay with the projects of the comprehensive system of dams and reservoirs.

In December of 1940 Lieutenant Colonel Stanley L. Scott, District Engineer, was replaced by Major Thomas F. Kern.

Decisions were being made in 1941 to discontinue certain civil works projects because of the imminence of war. Construction proceeded on the Blue Mountain and Nimrod projects, and bids were taken on the Norfork Dam.

Beginning in 1941, military work began to take on ever increasing importance. The following is an account of the creation of a warfare training camp north of Camp Robinson, near Little Rock:

"A mimic warfare camp of 39,500 acres north of Camp Robinson near Little Rock to train people in new methods of warfare is well under way thanks to the local engineers. Acquisition of this land was a very complicated task. Long hours of field work identifying property lines of tracts and estimates of their respective value, hours of office work typing lease forms and invoices, and personal negotiations with the owners of the land were necessary. These activities were "down the alley" of the U. S. Engineers, wise in the ways of leasing and purchasing lands for levees and reservoirs, but there was also a human problem—the virtual uprooting of more than 1,200 persons from their homes, some from homesteads occupied for generations by their families. New locations had to be found for them as the Army needed the land by February 1st.

"The Engineers were in charge of leasing the land. They have always advocated the purchase of such land, but since they work under the War Department regulation that prevents the purchase of such lands, these had to be leased. Captain John R. Crume, in charge of the land section, directed the work of leasing the land.

"Crews working in the Norfolk Land Reservoir area were called to Little Rock and 16 parties composed of two men each spent ten days identifying and recording the properties. Four appraisers from the Little Rock District, aided by two from the Tulsa District and two from the Vicksburg District appraised the land. They gleaned out the smallest details about everything—conditions of fences and the number of chickens. All improvements were photographed so that they might be restored if they were damaged during the lease.

"A crew of Government stenographers worked one month preparing the leases and final reports. All the inhabitants were moved. Their new homes may not have been as comfortable as their old ones, but some of the new farmlands were more productive.

"The Engineers reported that none of the people minded the move as long as they could help their country in its war time need. No more than fifteen families were forced to move farther than 60 miles from their old homes. Thirty out of 32 Polish families in the town of Marche found places near their church. The major question asked by all of these displaced persons, however, had to do with the time when they would be permitted to return to their old farms."

The Army wanted that particular land because it was similar to European terrain where the soldiers were expected to fight. The Army announced that the soldiers were to learn new methods of warfare that Adolph Hitler had used and which had been used in the Spanish Civil War in the 1930's.

Nominal work continued on the Blue Mountain and Nimrod projects throughout 1941 and 1942, but major emphasis was on military projects and installations after the entry of the United States into World War II. This great burst of activity was both a tribute to the capabilities of the District and a symbol of the national emergency. District strength quickly expanded from about 900 people to a war-time high of over 6,000, including key civilian construction personnel who were drafted and given

military rank to expedite the military construction program.

Of the major peacetime projects, only Norfolk Dam was given a military priority, because of the anticipated need for hydroelectric power. By 1943 the dam itself was in operation, and the power-producing facilities were being rushed to completion. In 1944 the power facilities were completed, but only after borrowing a generator from Fort Peck, Montana.

It was late in 1942 when the boundaries for military construction of the Little Rock District underwent a temporary wartime expansion to include all of Arkansas and the northern part of Louisiana to a point as far south as Camp Claiborne, near Alexandria, Louisiana. Under the vigorous and exhausting leadership of men like District Engineer Colonel Alex M. Neilson, both time and men were strained to maximum efficiency. Architectural engineering firms assisted in planning and construction, and other "outside" help was employed extensively during the wartime emergency.

The expanded District constructed aircraft training schools near Stuttgart and Newport, Arkansas. Many of these had several satellite fields; six camps such as Chaffee and Robinson; two supply depots; two internment camps; six ordnance plants, two Japanese relocation centers, at Rohwer and Jerome, and the Pine Bluff Arsenal. An Arkansas rice field was converted into an airfield in 4 months.

District and Corps pride was high during this period of response to national emergency. Colonel Neilson was respected and admired by his staff. When he transferred to the Southwest Pacific in November 1943, many members of the District went with him. In the Pacific area Colonel Neilson commanded an Engineer Boat-Shore Regiment, and participated in landings in the Pacific area from New Guinea to Leyte.

The Arkansas River did not allow itself to be forgotten during the war years, but rather drew to itself a large amount of attention as a result of two major floods—one

in the spring of 1943 and another in the spring of 1945. The flood of 1943 was particularly destructive. At Fort Smith the flood crest was nearly 4 feet higher than any previous flood crest, and the Arkansas valley was inundated by rising waters and destructive currents. The bank stabilization projects which had been partially initiated and maintained under the Flood Control Act of 1941 were wiped away, and once again the painfully inadequate works of men had been erased in a capricious moment of nature. Because the District was mobilized for war, it was able to respond to this natural emergency. Over 19,000 troops drawn from the Arkansas National Guard, Fort Chaffee, Camp Robinson and Livingston, were placed into combat against the rampaging river. Unbreached levees were reinforced or heightened, new levees were hastily thrown up, stranded citizens were rescued, or provisioned, and communications were augmented. At the height of the flood emergency German and Italian prisoners of war were used to help. These prisoners, under supervision of the Corps personnel, performed well. There was one tense moment when 200 prisoners of war were poised to escape, but calmed down when their guards bristled.

On another occasion two prisoners of war ran down the levee, but apparently changed their minds. During the flood fight most prisoners were too tired to think of escape. There were some individual acts of heroism among them. During the 1945 flood, a German prisoner of war, discovering a small break in a levee, lowered himself into the torrent to impede the flow of water until the sand bags could be brought up.

As had been the case in the past, the great destructiveness of the floods served to bring the problem of flood control to the attention of the nation. This caused Congress to act to prevent future disasters of this type. After the flood of 1943 Congress authorized the Corps and the

Secretary of War to spend up to \$10 million in the flood areas of the United States, as conditions dictated.

These floods, and the war, also served to rejuvenate an interest in control of the Arkansas River for navigational purposes. Civic organizations and leaders, political figures, and newspapers began to pressure Congress for a comprehensive plan which would stabilize the banks of the river and restore it to a dependable state for navigation. They hoped that the immense wartime energies of the nation could be channeled into a gigantic peacetime project to control and regulate the Arkansas River. The end of the war brought with it an end to wartime spending. In the immediate post-war years Congress responded to demands for economy.

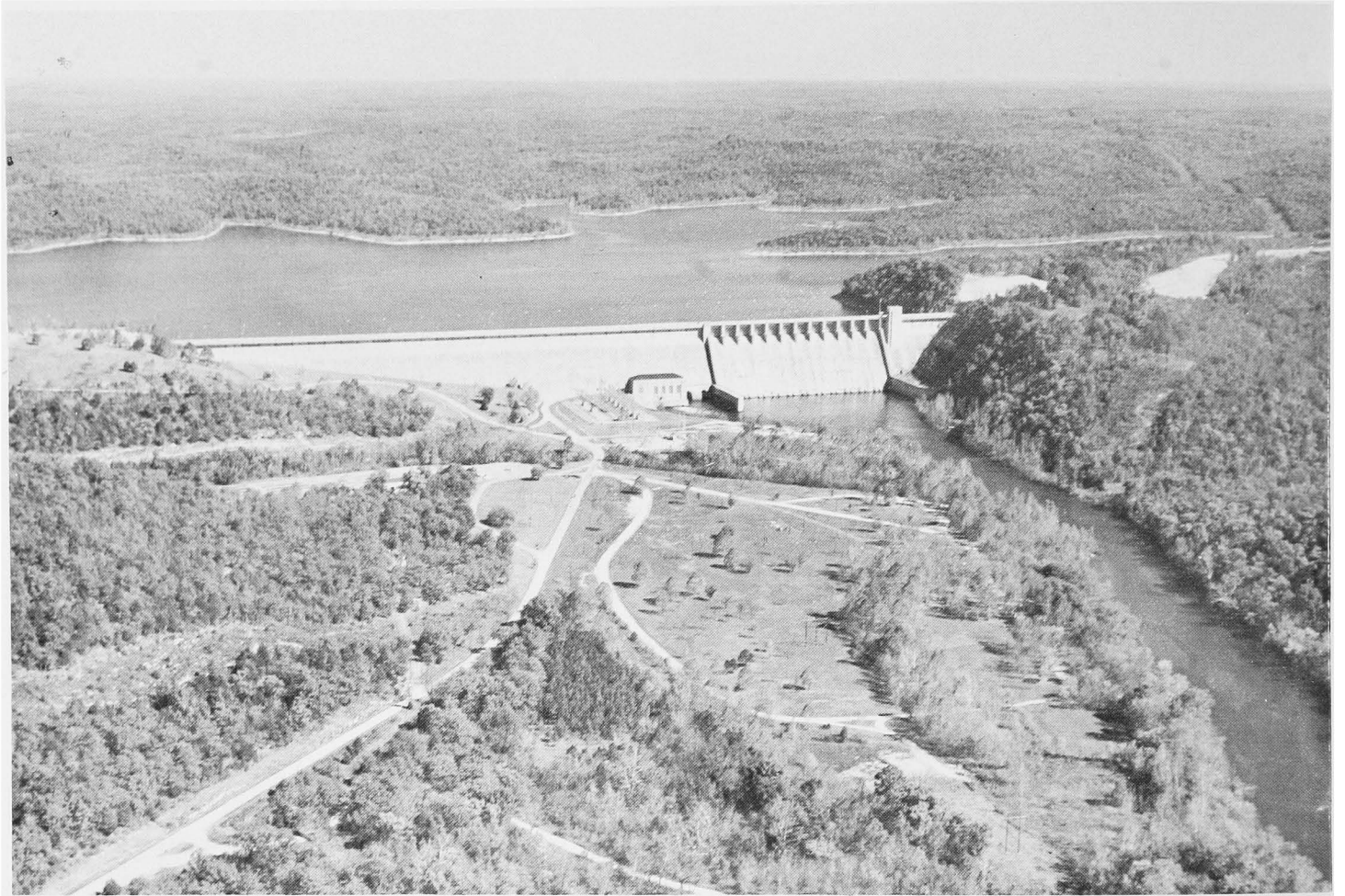
The immediate problems confronting the District at the end of the war were the same as faced by the nation—demobilization. The prisoner-of-war camps and certain military installations were phased out quickly, while others were eased out more slowly. The District itself was confronted with returning personnel who had a right to expect their old jobs, and yet it was vastly over-staffed from the war effort. It was difficult for the Personnel Branch to reduce the number of employees from about 6,000 to perhaps 1,000, and at the same time accept old employees back from the war into their previous jobs.

The key civilian personnel who had been drafted returned to their jobs without any problems.

After the war the Mobilization Detachment was sponsored by the Little Rock District to strengthen the District Office for other emergencies and at the same time allow the District to reduce its civilian personnel strength. The unit was staffed to replace almost all of the key personnel of the District except the District Engineer. It remained intact for the next two decades, finally disbanded when the possibility of another national emergency seemed improbable.



Dam Site Recreation Area at Greers Ferry Lake won a Merit Award from the Chief of Engineers in the 1970 Landscape Architectural Design Program in the General Landscape Development category. The District had preserved the natural growth and rock outcroppings when laying out the camp sites.



Norfork Dam on the North Fork River near Mountain Home, Arkansas.

## Norfolk and Bull Shoals Dams A Study in Economic Rejuvenation In North Central Arkansas

In north central Arkansas the Corps of Engineers impounded water behind the Norfolk and Bull Shoals dams. The lakes have transformed the local economy from one of quiet desperation to one of prosperity and optimism.

The dam on the North Fork, a tributary of the White River, was completed during World War II because of national need while construction on most domestic projects were halted "for the duration." It was rushed through to completion for its electric power production.

Construction began on Norfolk Dam in the spring of

1941. It was one of the original six reservoirs authorized for construction in the White River Basin in the comprehensive Flood Control Act of 1938. As originally authorized, power generation facilities were not included. At a meeting at Harrison, in 1940, a sizable group of citizens from the surrounding communities met to try to get hydroelectric power included as a project purpose. The Baxter County delegation wanted to pass a resolution which would have expressed solid opposition to any dam that did not include hydroelectric power production facilities. Fortunately the



District Personnel used on the construction of Norfolk Dam, February 8, 1941.



The south side of public square, Mountain Home, Arkansas, in the 1930's.

Batesville delegation including the well-known John Morrow and his son, John Morrow, Jr., and Douglas E. McClure, Jr.; was able to convince the assembly at large that such a resolution might be construed as general opposition to a dam. As events worked out, the citizens need not have been concerned about the electrical production. Shortly after construction was under way, Congress under the impending weight of probable war, authorized the installation of two of the four power generating units and one-half of the powerhouse as soon as the dam itself was in operation.

Why were the local communities so determined to have hydroelectric facilities? The answer is rather basic. Those areas were not adequately served at the time and the sparseness of population could not justify any expansive network of powerlines on the part of the private power companies. On the other hand, the population growth which usually came with the construction and completion of the dams and reservoirs could make it feasible for private power companies to move in. Some feared that the benefit-cost ratio would not have justified Congressional expenditure unless hydroelectric power was included. Pri-

The south side of the public square, Mountain Home, Arkansas 1971.





Main Street, Mountain Home, Arkansas, in the mid 1930's.

vately, most citizens would have accepted any Government project with open arms. Their local economy had been reduced to where the per capita income was \$100-200. Desperation gripped the communities. Farms were being abandoned and communities were drying up. In Baxter County alone, during 1940, more than 600 small farms vanished, most to be reclaimed by mother nature in default. Any solution, even a partial solution to their economic problems, was met with hopeful enthusiasm.

Mountain Home, Arkansas, was to derive the most spectacular benefit of the Corps project in the area, for

it was the largest nearby community, and was centrally located in relation to both Norfolk Dam and its younger counterpart, Bull Shoals Dam. Still, few of its citizens could envision then the economic change which was to come to the poor agricultural community. The town itself symbolized the mood of the period; abandoned stores, few paved streets, and fewer improvements on those that had been paved, no new businesses or prospects of businesses, young people all moving away to better opportunities, and an air of decay. Chickens roamed the streets, the pigs rooted in the town square, however, neither seemed dis-

Main Street, Mountain Home, Arkansas 1971.





Public Square, Mountain Home, Arkansas 1943.

turbed by wagons or dusty pickup trucks.

Before the first shovel of dirt was thrown, or the first tree dozed down, the Mountain Home people knew that a new era had dawned. Government and construction personnel moved into the area, searching for housing and asking for provisions. Federal and private payrolls reversed the economic blood-letting which had been draining the area of its vitality. Even before construction of Norfolk Dam was completed, newcomers and tourists had begun to supplant the town's transient prosperity with a permanent prosperity that has become characteristic since that time. Tom Dearmore, later Co-Editor of *The Baxter Bulletin*, located in Mountain Home, said that he quit his "low-paying" job at the print shop to take a job at the Norfolk Dam for 30 cents per hour, "a fabulous common-labor wage" for the area.

Norfolk Dam was completed in 1944, and as soon as a generator could be installed, the long-awaited electric powerplant was in production. As with most wartime pro-

jects, the nonessential aspects of the structure had to await completion until after the war. Temporary switchyard structures, plywood doors in the powerhouse, and bare concrete walls characterized the new structure, but it worked, both in holding back the water and in producing electricity. History, of a sort, was being made. Norfolk Dam is one of the oldest multi-purpose concrete structures built by the Corps of Engineers. Furthermore, the dam itself has attracted engineers from other nations to visit and inspect it and it has served as a model for subsequent projects.

Once the Norfolk Reservoir had filled, a new lake of some 30,700 acres, with a shoreline of 510 miles was created. The reservoir contains nearly 2,000,000 acre-feet of water, with a flood storage capacity of some 732,000 acre-feet. This storage capacity enabled the Engineers to store floodwaters 26 times within Norfolk Dam's first seven years, preventing millions of dollars in flood damage and freeing the farmers downstream of their age-old fear



Public Square, Mountain Home, Arkansas 1971.

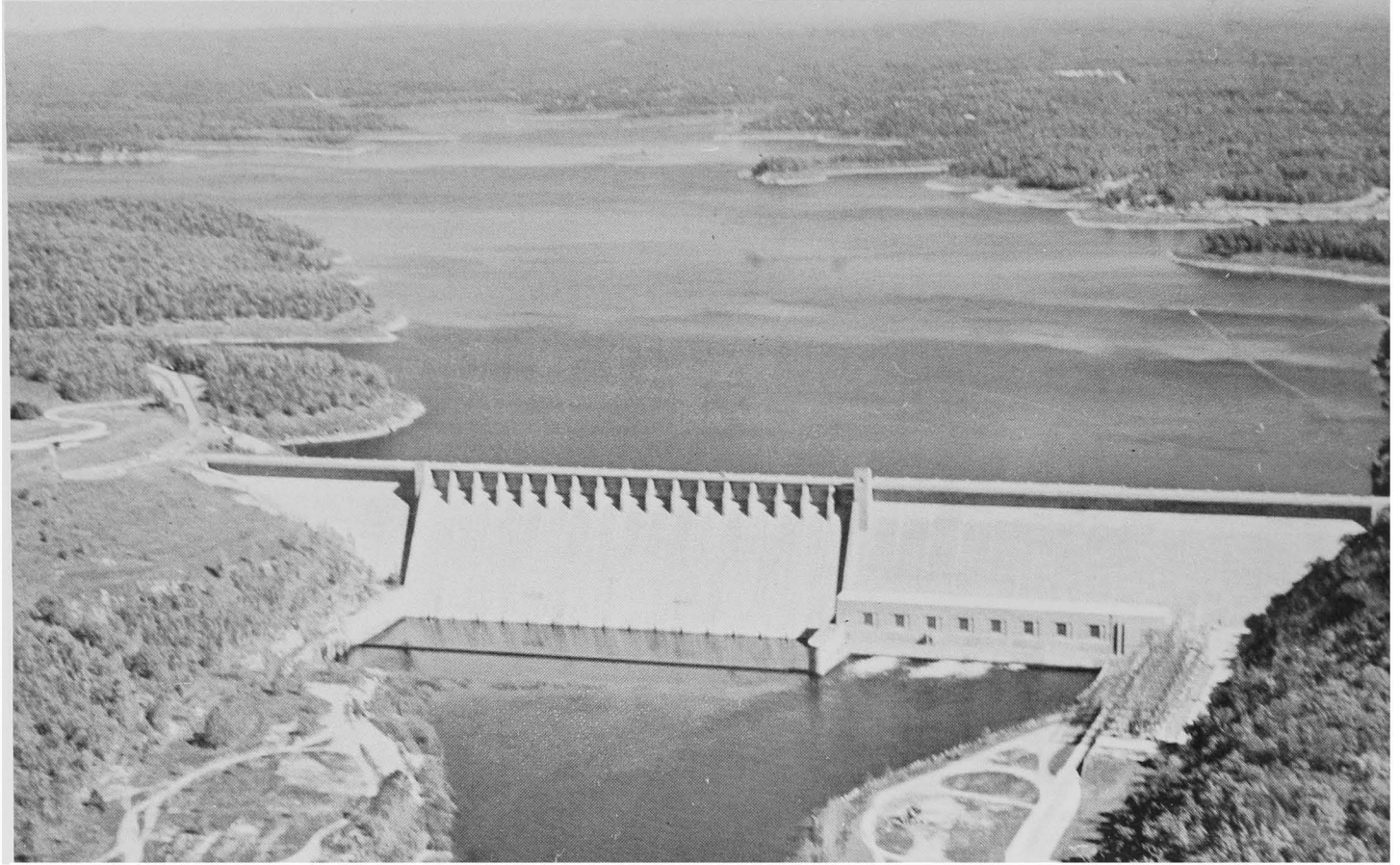
of floods. With this new freedom the ravages of many floods, abandoned farms on the downstream plains began to be reoccupied, although most of them by new owners.

Shortly after World War II, the Corps of Engineers was able to begin work on the Bull Shoals Dam, located on the White River 10 miles west of Mountain Home, Arkansas. This dam was authorized by the Flood Control Act of 1941 for flood control, generation of power, and "other beneficial uses." Not faced with a national emergency, the construction pushed along at a more normal pace. Construction was initiated in June of 1947, and completed in July of 1951, with commercial power generation commencing in 1952.

The superintendent of the Bull Shoals Dam was Harvey Slocum, sometimes known as "Mr. Dam Builder." Slocum was an unrelenting hard-driver and perfectionist. During the construction of Bull Shoals Dam he had a house built right on the edge of the bluff. From his glassed-in front porch, he would sit during the night to watch operations.

Bull Shoals would be a much larger dam than Norfolk, and in fact one of the larger concrete dams in the nation (5th largest at that time). It extended 2,256 feet across the White River Valley and contained over 2,100,000 yards of concrete. For its time the sheer magnitude required special procedures to handle the unusual problems: how to get that much aggregate to the site of the work.

Slocum solved that issue by installing one of the longest conveyor belts to be used on that type of construction. The belt system consisted of 21 flights, varying in length from 600 feet to 2,800 feet. It transported 650 tons of aggregate per day at a speed of 525 feet per minute over a distance of 7 miles. The belt made possible a daily pour of 6,651 cubic yard of concrete at the dam site. It was something of an engineering accomplishment, as each flight was powered by a separate motor of 75-125 hp. The entire system was interlocked and automatic, so that a malfunction anywhere along the 7 miles of terrain and 14 miles of belt would cause the whole operation to halt until repairs



**Bull Shoals Dam on the White River near Mountain Home, Arkansas.**

had been completed.

The many industries which have located in the vicinity cite labor supply, central location, or scenic environment as their major consideration in locating there. The role of outdoor recreation and retirement attractions have become unquestionable.

In 1940 there were only 13 vacation resorts, cottage camps, lodges, hotels, and similar establishments where overnight accommodations for 108 people were provided in the area. By 1970 there were 300 such establishments with overnight accommodations for 8,339 people. In 1940 there were only seven restaurants, cafes, and public dining rooms in the vicinity, but by 1970 there were 83 such places. The number of persons employed in service trades or business in the vicinity had risen from 65 to 3,880. The

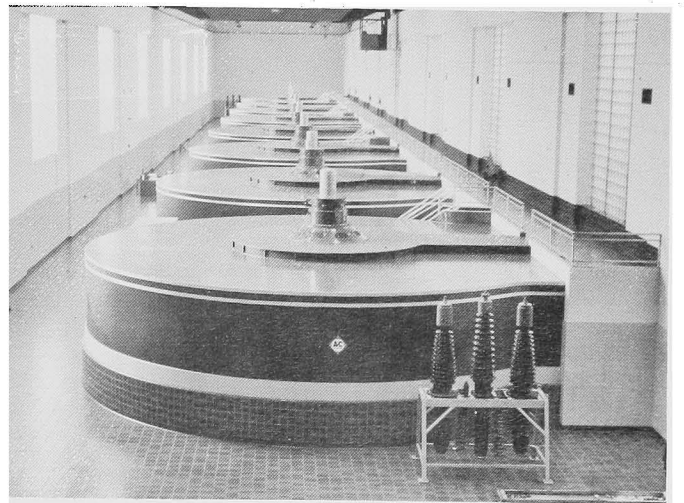
value of commercial boats, docks, motors, and all boating facilities has risen from \$750 in 1940 to over \$1,771,000.

The assessed valuation of all taxable property in counties in which the lakes are located (Baxter, Boone, and Marion, Arkansas; Taney and Ozark, Missouri) has risen from \$14,890,000 in 1945 to \$76,397,584 in 1970. Finally, in 1970 the Corps reported that over 5,885,000 visitors had come to the dam sites and reservoirs.

In the ten-year period between 1960 and 1970 per capita income rose some 98 percent, and manufacturing payroll increased by over 337 percent, while deposits in the financial institutions were up by 207 percent. Since 1960 about 1,500 new industrial jobs have been created in Baxter County alone.



Seven-mile long conveyor system supplied material from quarry to Bull Shoals damsite. December 1948.



Generator Floor in Bull Shoals Dam powerhouse.

## Table Rock and Beaver Dams

In October, 1954, construction of Table Rock Dam, at Branson, Missouri, was begun. Beaver Dam had been authorized a month earlier under the Flood Control Act of September 3, 1943.

As with other Corps projects, these dams had a long history of proposals, refusals, counter-proposals, delays, despair, investigations, and political involvements. The Table Rock site had been under consideration for a hydroelectric power dam as far back as 1901, when the town of Hollister, Missouri, had surveyed the site for that purpose. When the Corps of Engineers entered the picture in 1928-31 in the midst of an economic depression, it made a negative decision for construction of a dam. The Corps of Engineers did report that the site was well suited for a hydroelectric dam, but added that existing economic conditions did not warrant Federal expenditures or participation.

On the eve of the economic depression of 1929, the Empire District Electric Company, a subsidiary of Cities Service, had purchased a site in the vicinity of the Table Rock site with intentions to construct a small hydroelectric power facility. The depression deferred their immediate ambitions, leaving only the hope of Federal participation for the local communities. The involved communities were well represented by civic minded leaders who were eager to devote their time, labor, and expenses in promoting such a project. Such people were Ben Albert Parnell, Sr., John P. Woodruff, and Lewis Reps of Springfield; Rex Allman from Forsythe, and Dr. Wiserman of Branson. They and others had coalesced into the White River Booster Association, and during the 1930's Ben Parnell made frequent

trips to Washington to keep the Table Rock project alive.

Unlike the Mountain Home area to the southeast, the Branson area was not one of chronic economic depression. The area was already recognized for its fishing, and during normal times the community had a rather stable and moderately secure economy based on fishing and recreation, reinforced by agriculture. Lake Taneycomo had been created shortly after World War I as the result of impounded waters restrained by a privately developed power dam, and Rockaway Beach was probably the first resort to be built in the State of Missouri. The area was hard hit by the depression, but the economy began to recover its former vitality as the Nation struggled out of its economic disaster.

If the area did not have an absolute need for a dam to assure economic prosperity, there was no question about the need for a dam to protect property in the downstream reaches from the ravages of the White River. Local citizens have etched memories of bridges being washed out, farms being washed away, houses floating down the turbulent waters, trains being shunted aside, and mud hip-deep in the middle of town. As a result of these recurring disasters the citizens of the river communities were primarily interested in a dam for flood control purposes, with hydroelectric power production and even recreation as attractive secondary considerations. Joe Alexander of Branson said that every flood "nearly ruined us, . . . and some were worse."

An unusually disastrous flood in 1935 and President Roosevelt's "New Deal" to create employment through public works, caused Congress to authorize a further study

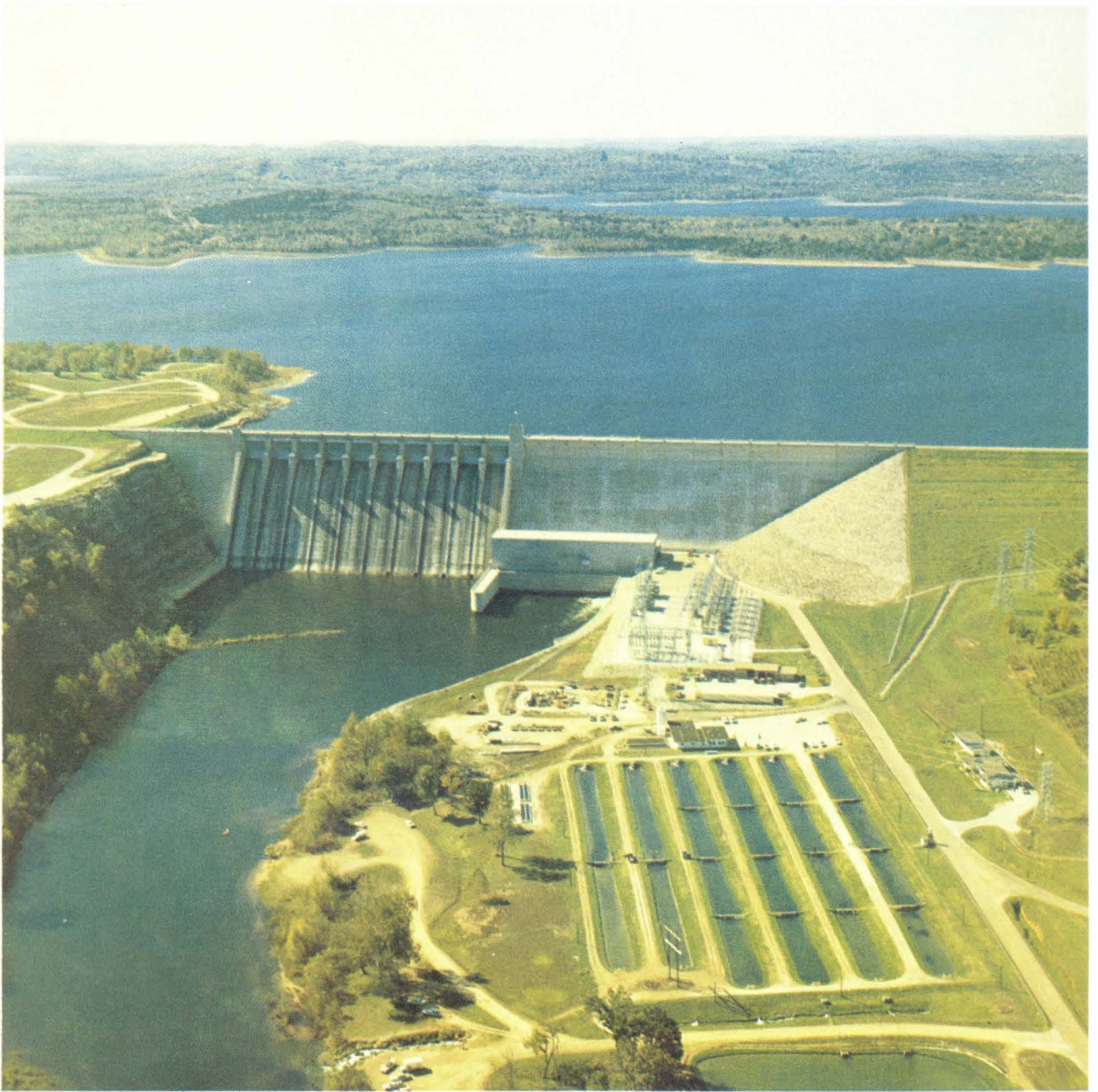


Table Rock Dam on the White River near Branson, Missouri.



Ground breaking for Table Rock Dam, October 10, 1952. Left to right: Congressman James W. Trimble, Berryville, Arkansas; O. D. Lee, president Branson, Missouri, Chamber of Commerce; Orval Faubus, chairman, Arkansas State Highway Commission representing Governor Sid McMath of Arkansas; Lt. General Lewis A. Pick, Chief of Engineers; Congressman Dewey Short, Galena, Missouri.

of the situation. This time the Corps of Engineers concluded in their report that Table Rock Dam should be built, and the dam was authorized by the Flood Control Act of 1941, for "flood control and hydroelectric power, and other beneficial water uses."

Although actual construction did not get under way until well after World War II, the intervening time was used in surveying, tracing ownership of land, cemetery removals and, of course, determining the exact location of the dam. Numerous core-drilling crews tested locations which had appeared to be ideal but after core drilling, had proven to be unsuitable because of faulty geological conditions.

Mayor Tom Epps of Branson, who was also President of the Chamber of Commerce, credits "the Missouri boy in the White House" for getting the initial appropriation, but the project suffered another setback.

Congress ordered a halt to all construction when activities were delayed by the Korean War. A new study was completed on the need for power in the area, on the ability of the existing governmental and private power interests to meet future needs, and the adequacy of the cost estimate. The project was resumed after approval by the Appropriations Committee of the House and Senate, and

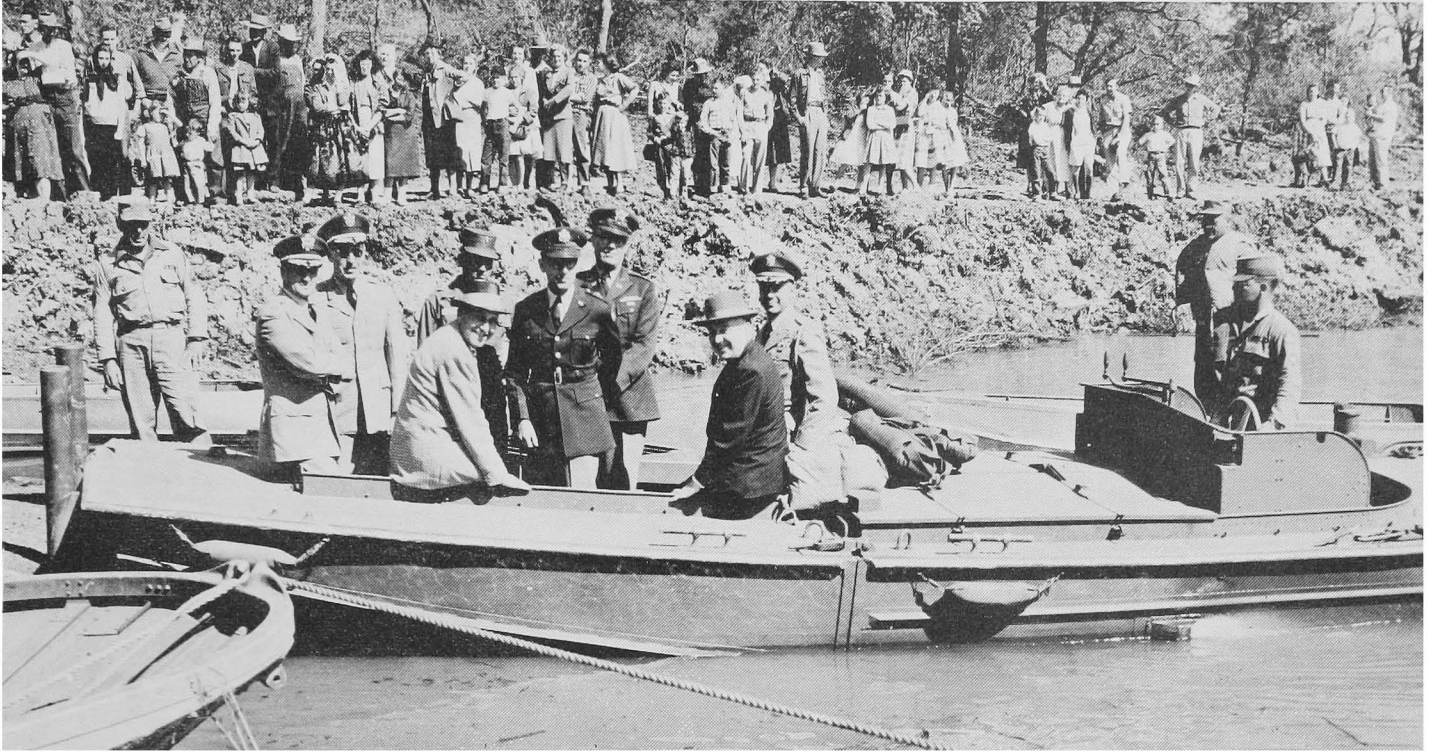
authorization for resumption resulted in the award of the contract for the dam to Morrison-Knudsen and the Utah Construction Company, in October of 1954. At that Little Rock bid opening Mayor Tom Epps at last witnessed the complete fulfillment of the dream so long pursued by his community.

Construction and reservoir clearing proceeded but with some delays and occasional protests, most often reflecting disagreement among the fishermen as to how much of the basin should be cleared. Some of the local people wanted the entire basin cleared out, but the fishermen figured that their fishing would be better if the timber were left intact at the deepest portions of the reservoir—the usual policy. The Corps interest was that no trees be exposed at low water.

As though to emphasize the need of the dam for flood control, the rains of May 1957 brought on flooding conditions while the dam was yet under construction. Some of the monoliths near the center of the dam were still being poured when rising flood waters back of the incompleting dam crested over these incomplete monoliths to cascade downstream into the old river bed. Paradoxically, the waters behind the partial dam were contained sufficiently to prevent downstream flooding, but the unexpectedly quick rise in the reservoir surprised property owners who were still in the process of moving their houses and movable property out of the reservoir area. The towns across from Branson were saved from considerable damage. The flood delayed construction for a short period, of course, as the Engineers rescued property owners caught in the partially cleared basin. Partially complete Bull Shoals Dam held flood waters throughout the fall months because downstream conditions kept the lower channel capacities at their limit.

The dam was completed in August of 1958, and power was on the line in June of 1959. As originally authorized, the hydroelectric facility plan was four power units of 35,000 kw. capacity, each with only two of these to be installed initially. The project was modified in the planning stage to supplant the 35,000 kw. units with 50,000 kw., and finally, in 1957, it had been decided to install four units initially though the powerhouse could ultimately contain eight units. Even with these changes, the cost of the project had dropped from the estimated \$76,000,000 in 1951 (using the 35,000 kw. units), to under \$67,000,000 in 1959. As District Engineer Colonel Arthur Jacoby pointed out at the dedicatory ceremonies at Table Rock, June 14, 1959, this means that the final ratio of annual benefits to annual costs had improved to 1.5 to 1. In other words, there would be a return of \$1.50 on every \$1.00 that was to be spent on the project.

Also present at the dedication were such notables as Major General E. C. Itschner and Brigadier General William Whipple, as well as Dewey Short, Assistant Secretary of the Army, and Senator Stuart Symington from



Assistant Secretary of the Army Dewey Short visits Kimberling Ferry, Missouri, May 5, 1957.

Missouri, each of whom made a short address.

In paying tribute to those citizens who had worked so hard to obtain the project, Colonel Jacoby said: "The massive structure stands as a monument that will remain for generations in recognition of the efforts of some of the local citizenry and neighbors who, with their vision and foresight, overcame many barriers in making possible the dedication of Table Rock—the project stands as a monument to their wisdom and faith and the engineering skills of the Corps of Engineers and contracting industry of the United States."

Table Rock Reservoir caused the economy of the immediate vicinity to grow along the usual path of prosperity surrounding a new fishing area, with an influx of business and trade oriented to the vacation-recreation economy. Branson, Missouri, was the chief beneficiary; within ten years the population of Branson had doubled, bank deposits had quadrupled.

Branson was in a natural geographic position to benefit from the reservoir, but part of Branson's prosperity came from its civic leadership and the willingness of the town to go out after business by extending town facilities

to outlying areas. The town staged an annual fall festival in October, and an annual "Plumnelly" celebration (the title originally derived from the fact that the summer celebration would have "plum nearly everything" for everybody), with street dances, local costumes, banquets and dinners, water events, and fishing prizes.

Originally conceived by a railroader, an authentic English village was restored at Hollister, Missouri. With the help from the State of Missouri, its restoration was completed by W. W. Johnson, of Springfield. Its building code had restricted every structure to English Tudor styling, and for a while in the pre-World War I era, the town had thrived because of bustling railroad business. With the end of the railroad era, disaster came to the town of Hollister, and by 1950 even the town's central structure, the English Inn, was boarded and abandoned. The town had been unable to withstand the frequent and disastrous floods so characteristic of the White River Valley.

The completion of Table Rock Dam removed the constant threat of flood disaster, and also accelerated the tourist trade. The town was "deboarded" in January of 1967. The Inn was refurbished and shops restocked, and



Beaver Dam on the White River near Eureka Springs, Arkansas.

the moribund community has awakened to a new life and a new era.

The Table Rock Reservoir extends 79 miles upstream along the White River and lays within parts of Arkansas and Missouri. It has a surface area of 52,300 acres (smaller than Bull Shoals but larger than Norfolk) a shoreline of 857 miles, and a drainage area of 4,000 square miles.

Construction of nearby Beaver Dam, authorized in the Flood Control Act of September 3, 1954, began in November 1960 and was completed in June 1966. It added the uppermost link in the chain of White River and tributary dams. Beaver Dam powerhouse is operated by remote control by powerhouse personnel at Table Rock, and produces its electrical output by two generating units which feed the Southwestern Power Administration (SPA) lines.

Although a companion to Table Rock Reservoir, Beaver Reservoir experienced a different growth pattern. The other White River reservoirs had gained their prominence as summer recreational and resort centers, Beaver soon became known as a residential lake with only occasional resorts. People from the Fayetteville, Springdale, Rogers, Bentonville, and even Springfield areas discovered they

were within reasonable commuting distances of the lake, and realtors catered to the housing boom.

The Engineers had to relocate only a few structures and facilities at Beaver Reservoir. Among the more interesting relocations was the grave of Coin Harvey, a well-known economist and writer of circa 1900. Coin Harvey had built an old stone amphitheatre, but no attempt had been made to remove or relocate the amphitheatre, because it would be under water only during infrequent flood periods.

The Beaver Reservoir also served as a pioneer in the new uses of its water. Water was taken from Beaver Lake and piped to such diverse locations as Fayetteville, Springdale, Rogers, Bentonville, and other smaller towns of the area. This service was set up through the creation of the Beaver Water District by all of the involved communities that wished to take advantage of the water storage capacity of Beaver Reservoir.

By 1970 the wisdom and foresight of channeling water to Fayetteville was well proved. During the summer of that year a severe water shortage caused that city to ask its customers to stop watering lawns and to conserve water

in other ways. Commercial and industrial users were also asked to restrict their use of water. The city's water plant could produce but 8.8 million gallons of water per day, and the daily use of water had peaked that exact figure. At that crucial time, the city completed its 17-mile long, 36-inch line to Beaver Lake and 25 million additional gallons of water daily became available.

By arrangement with the Government, the Beaver Water District had agreed to pay a share of the project cost, the percentage based on the amount of water storage space that they would need. The Government does not sell the water but it can agree to furnish the facilities for storing the water. If no water drained into the reservoir the Government would still have lived up to its contract. The municipalities themselves, through the Beaver Water District in this case, would also pay for the

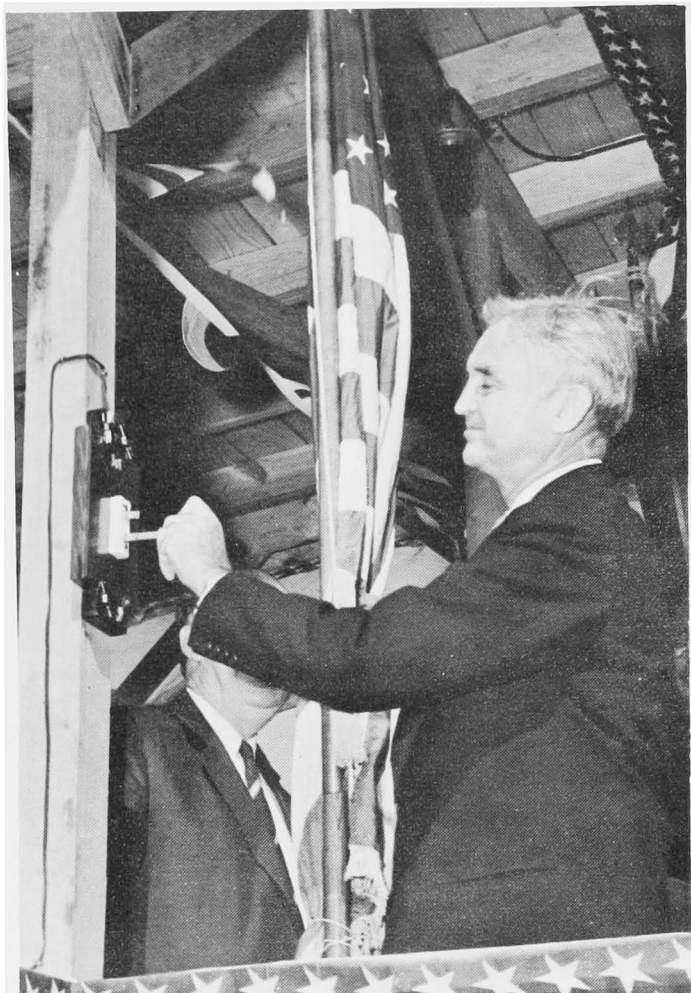
intake structures, pumping plants, and waterlines to the areas served.

At times the Corps has tried to encourage nearby towns and municipalities to lease an area for its exclusive use and development, and at other times there has been an attempt to encourage promised development of leased areas—both met with varying degrees of indifference and success.

Efforts to induce municipalities to lease areas of their own control and development has not met with overwhelming success. Editor C. W. Johnson of the Springfield (Missouri) News Leader noted that some communities had done "a real fine job" in catering to the visitor, others did not, and "the total of complaints received by the Engineers—mostly because of unsanitary conditions, was impressive." By 1963 some of the communities were returning

Boating was popular at all the District's lakes.

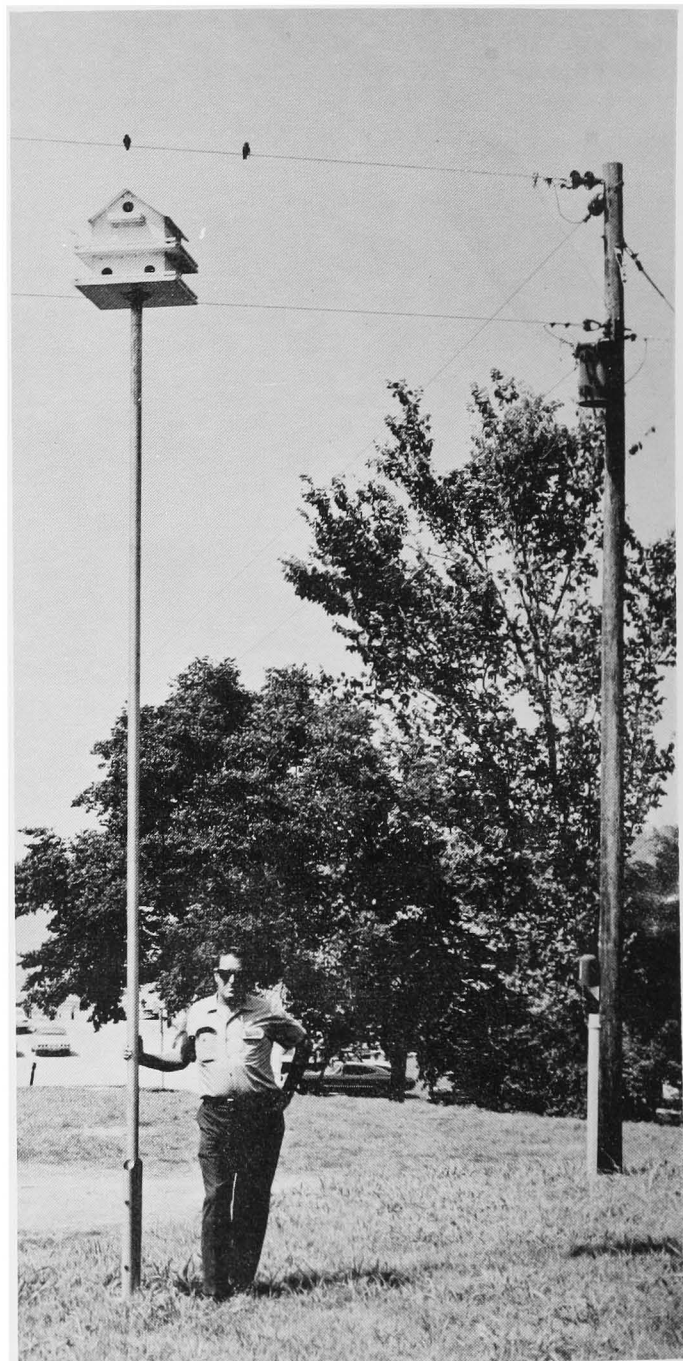




Senator W. Stuart Symington of Missouri throws the switch to energize a main turbine at the Table Rock Dam dedication June 14, 1959.

their licenses. Complications developed from licenses being returned. Some cities asked for compensation for their wells, rest rooms, picnic tables, and other facilities they had installed on their leased lands.

Not all municipalities have been disappointed with their community leases. The editor of the Cassville Democrat wrote that the Cassville lease had worked out well for the community: "Cassville has not been out a penny on sponsorship of Campbell Point Dock—it is pleasant to know that only one out of five docks located in Barry County is included in the franchise release requests."



District's Purple Martin program first received national publicity at Beaver Lake in 1969 where the birds successfully removed insect pests from recreation areas.



District lakes attract fishermen from many states.

## Greers Ferry Dam

In the Flood Control Act of 1938, hydroelectric power was not to be a factor in all six flood control reservoirs in the White River Basin Plan. Additional Congressional Acts, passed under pressure of domestic needs, dictated the inclusion of such facilities in all of the dams on the White River.

As the concerned citizens were to learn, having a project authorized and getting appropriations were two different things. Local initiative, enthusiasm, and support of a project was certainly not unique, but it was a critical factor in the development of the Greers Ferry Dam project.

As far back as the 1920's, citizens of the Greers Ferry Dam area were promoting the idea of a dam on the Little Red River. The small resort community of Heber Springs drew on support of smaller communities in the surrounding area, and reached out to seek the assistance from Batesville citizens to stir latent interest. The Great Depression of the 1930's ended any possible action at the time, but the seed of a dream was firmly emplanted, needing only to be nourished back to life following economic recovery.

President Franklin Delano Roosevelt and the New Deal nourished the idea that the Government could and



Winkley Bridge is a one-lane, plank-floored bridge that has attracted tourists since it was built in 1910. A new bridge

parallels it over the Little Red River, downstream from Greers Ferry Dam, east of Heber Springs, Arkansas.



Groundbreaking for Greers Ferry Dam, June 11, 1957. Left to right: Senator John L. McClellan, Congressman Wilbur D. Mills, Major General E. C. Itschner, Chief of Engineers; Senator J. W. Fulbright; and J. C. Pearson, president, Greers Ferry Dam Association.

should undertake projects that would restore economic vitality, or that would bring economic vitality to chronically depressed areas. In this atmosphere the plea for a dam was more receptive. The Corps was authorized to make some preliminary surveys. The appearance of Corps of Engineers personnel in the area of Heber Springs excited the local citizens. Mr. O. F. "Fred" Huson, one of the prime promoters of the Greer's Ferry project, recalls that the appearance of any vehicle with a Corps of Engineers emblem was enough to bring out the whole town, dressed in their Sunday best. Mr. Huson remembers that the project had been under consideration for so long that most people "decided that it was a creation of someone's imagination."

To say that Heber Springs was an area of particularly desperate economic emergency would not be an accurate assessment of the facts in the early 1930's, for Heber Springs did not seem to be in any more economic trouble than the rest of the country. Its population was at an all-time high of 1,300, and it held basic attractions for those who enjoyed good fishing and outdoor activities.

A picturesque old swinging bridge near the site of the present dam was, in itself, a state-wide attraction. Constructed in 1912, it was a suspension bridge erected with a wooden frame hung on two steel cables. With a load limit of 3 tons, and wide enough for only one vehicle at a time, the bridge enjoyed a reputation for giddy excitement. People came considerable distances to see and experience

the "swinging" bridge. A picnic area was located at one end. Tourists often spent the day there, crossing and re-crossing the bridge while becoming engrossed in the inevitable game of counting the boards in the decking.

Neither the good fishing nor the bridge could halt the state of decline at Heber Springs. The rest of the nation had begun its slow struggle out of the depression. The population was drifting away, farms were being abandoned, and stores which went out of business were not reopened. The possibility of a dam encouraged the local citizens that remained. At the beginning of national economic recovery, there were still too many projects more vital than the Heber Springs project. The Greers Ferry project was filed away for possible future action. The people of Heber Springs would have been happy with a dam without hydroelectric power as authorized in 1938, but the benefits were too limited for consideration by that time.

One would have to await the verdict of the great experiment of the Tennessee Valley Authority to see whether the public would accept the principle of Federal involvement in hydroelectric power, and then determine if it was practical.

The coming of World War II delayed any reactivation of the Heber Springs dam project, as it did to so many other projects. Soon after the war the local citizens rallied their forces again to continue the struggle for a dam. Among the "new blood" in the renewed struggle was J. C. "Cliff" Pearson, who had recently arrived from Coffeyville, Kansas. Pearson joined with Huson and others to reorganize the Greer's Ferry Dam Association for the purposes of promotion and keeping local people interested and informed on the status of the project. Together they signed up 1,000 boosters, charging a fee of only a dollar a year for membership. As Mr. Pearson says, they were more interested in people than in fees, even though the fees served to help finance many trips to Washington.

The real struggle came in convincing Congress their project was vital. The Greers Ferry Dam Association applied itself with renewed vigor, but it was to face many delays.

By this time the local proponents knew all the arguments and usually endeavored to show that the Little Red River Dam was necessary to complete the flood control program which was already underway in the White River Basin.

In 1941 the Heber Springs Delegation which attended a public hearing at Little Rock, Arkansas, pointed out to the officials that the annual direct flood loss in the White River was \$2,185,000 and that most of that loss was sustained on the lower White River from the point at which the Red River empties into the White River. The delegates presented figures to support their claim that in relation to the North Fork tributary, on which Norfolk Dam was then being constructed, the Little Red was longer and drained a greater area.

They showed evidence that hydroelectric facilities could reverse a trend wherein they said two-thirds of all electric power consumed in Arkansas was purchased outside the State. The per capita income of the area in 1941 was only \$400. Federal expenditures for relief and rehabilitation totaled over \$415,000. They said a dam would put the area on its economic feet, stop an economic drain and would reduce Federal expenditures in the area for relief and rehabilitation.

These public hearings are an important phase of the development of all Corps of Engineers project, for at these hearings the public is invited to present its reasons for or against the project under consideration.

There was little individual protest registered at these meetings, and no organized resistance to the idea, for the benefits were quite apparent. Hydroelectric power had been proved economically justified. In contrast, the promoters could count upon almost unanimous popular support. Electric cooperatives published a brochure entitled, "It's Time to Build Greers Ferry Dam." The unanimity of opinion created a premature sense of victory.

This sense of impending victory, Pearson recalls, was shattered during one of his four trips to Washington. There he was asked to meet with the Director of the Bureau of the Budget, Mr. Dodge.

"We didn't understand why Mr. Dodge wanted to meet with this (Greers Ferry Dam Association) Committee. We didn't know that we rated near that high. But Congressman Wilbur Mills arranged for the entire delegation to meet with Mr. Dodge. I gave him the Greers Ferry story. "He wanted to send up a trial balloon the (Eisenhower) Administration was toying with as an economy move that for any authorized project needing added features would have to have those added features financed locally by either local or State interests. In our case that would have been \$27,000,000 for the hydroelectric facilities.

"We felt beaten, because we know that the project would not be authorized without the electric facilities. The Greers Ferry Dam Association had not been able to pay even the full cost of this trip to Washington, let alone \$27,000,000."

By the time Pearson and the other delegates returned home from Washington they had rededicated themselves to overcoming all obstacles. They knew that the administration's economy move meant the end of all new projects for the south, if not the entire nation. Impoverished communities could not rally local investments of such magnificent proportions. They felt that the Administration would change its position when the whole story was presented.

Town meetings were held throughout the Greers Ferry region and within a matter of weeks towns from Clinton, at the headwaters of the proposed reservoir, to Clarendon, downstream on the White River, had presented civic organization resolutions favoring the dam. In all, 49 resolutions poured into the nation's capital in the next few weeks.



First concrete was placed in Greers Ferry Dam on April 11, 1960. Present were, left to right: W. W. Ralphe, Chief, Construction Division; Lincoln F. Sherman, Resident Engineer; P. J. Soukup, Superintendent and W. Wixon, both of Red River Builders; and Colonel A. M. Jacoby, District Engineer.

The Arkansas legislature added its own favoring resolution. The two representatives from Cleburne and Van Buren Counties carried the resolutions to Washington.

Though Greers Ferry was one of the original six flood control reservoirs in the White River Plan that was approved by the Flood Control Act of 1938, its authorization was finally modified by the Flood Control Act of 1954 to provide for generation of hydroelectric power. Some small flurries of construction began in June 1957 but the major construction did not begin until 1959.

In February 1959, a contract was let to Morrison-Knudsen Company, Inc., as the sponsor of a joint venture with Johnson, Drake, and Piper, Inc., and Henry J. Kaiser Company. The \$17,613,000 contract called for the construction of a dam which would need 850,000 cubic yards of concrete, and which would tower 249 feet above the streambed of the Little Red. The top of the dam, also serving as a highway, would be 1,704 feet long, extending from one side of the river valley to the other, and would include a 280-foot spillway section topped by six radial-type tainter gates each 40 feet wide and 36 feet high. To funnel water into the turbines, two pipes (penstocks) were to be built into the dam. Water surging through these penstocks would drive the turbines and generators producing 96,000 kilowatts of power. Bidding for the powerhouse was separate, with the contract going to Paul Hardeman, Inc., of Stanton, California, whose bid of \$3,297,672 was the lowest of the seven submitted.

The Corps had picked a site 79 miles upstream on the Little Red River, 2 miles north of Heber Springs. The reservoir which would back up behind the dam would form two separate lakes connected by a gorge called the "Narrows." The reservoir would drain an area of 1,146 square miles upstream from the dam, and would have a total capacity of 2,844,000 acre feet. When filled with floodwaters, the lakes would have a 340-mile shoreline, and the lake surface would be 40,500 acres.

Writing from Heber Springs, Fred Petrucelli called the project "Nectar from the gods," and said that the dam would act as "adrenalin" to the city's economy.

Work on the dam itself began on March 1, 1960. Hundreds of workers arrived at Heber Springs, and by early summer trailers were on nearly every vacant lot and some in yards of private homes. All vacant houses were rented. New houses were rushed to completion. The town itself exploded into a fury of activity never before witnessed by even the oldest residents. The Cleburne County Bank rushed through a \$50,000 expansion program, and a new bank, the Arkansas National Bank, broke ground. Thomas Massey built a new supermarket. Main street was revitalized and temporarily took on the appearance of a frontier boom town. New stores, motels, restaurants, and service organizations strained the town's utilities as they valiantly tried to expand their services. The farmers of the vicinity felt the economic impact through the greatly increased demand for agriculture produce, livestock, and poultry. Twenty-two Grade A dairies and several Grade C milking operations were strained to capacity.

Before the new reservoir could be filled, several problems had to be resolved. A railroad had to be relocated. There were roads, pipelines, utilities, cemeteries, and even a town that had to be moved. Each situation required public hearings, private confrontations, and compromises.

The railroad in question was the old defunct Heber Springs to Searcy section of the Missouri-Arkansas Railroad, which had not yet decided to abandon the line. The cost of relocation would have been prohibitive; and thus, for a while it appeared that the rusting railroad line would be a major impediment. After 2 years of indecision, the railroad agreed to abandon the line, thus resolving that particular problem. The Corps of Engineers eventually relocated some 52 miles of roads, 50 miles of powerlines, 20 miles of telephone lines, cemeteries, and most of the town of Higden, Arkansas.

Throughout 1959 more contracts were let for many other activities connected with the project. The contract for the relocation of ten cemeteries in the Greers Ferry Reservoir area was awarded to Meggs & Sons, funeral directors from Halls, Tennessee.

Cemetery relocations presented special problems. Aside from the usual public hearings, relatives of the deceased had to be contacted for permission to relocate the remains. The problem was compounded by faulty or missing

grave markers, incomplete or missing records, and unknown or nonexistent relatives. The Corps of Engineers found many individual graves, family grave sites, church graveyards, and an Indian burial city that had passed into oblivion. They searched for living relatives through consultation with older residents and reading scanty records or old newspapers. For most of the graves, time had erased all traces of the buried individuals except for a slight discoloration of the ground resulting from rusting and decaying caskets. This discolored ground was relocated to new burial sites. Funeral homes, which were contacted for grave relocations, handled each case with the same care and consideration they would have shown first interments. Outside of cemeteries individual burials were difficult to find, except in the case where a hangman's tree provided an irrefutable landmark.

The relocation of the town of Higden was surprisingly easy. Higden was located at the north end of the "Narrows," which would later separate north Greers Ferry Lake from south Greers Ferry Lake. Most of the town was to be inundated by the waters which would be backed up by the dam. The Engineers bought the old townsite, relocating the people farther up the hill. Only five of the original houses were to be beyond the reach of the water.

The town had purchased the land from the school district. Mayor David Gadberry believed the new Higden population of 125 was the same as before the relocation. Newcomers who had moved in to take advantage of fishing and retirement had compensated for original townspeople who had moved elsewhere. In many ways the new town was better off. Its buildings were newer or in better repair, and the new streets were blacktopped. The new general merchandise store, representing the total business community of Higden, expanded to catering to fishermen, vacationers and retired people.

The work of clearing trees from the reservoir was delayed while the Engineers listened to alternate suggestions of interested citizens and civic groups. The Corps had tentatively planned to clear 35 percent of the lakeshore. Timber removal was to be made from the elevation at top of the power pool shoreline to a depth of about 2 feet below a "10-year frequency drawdown" or average for a drought period. No trees were to protrude above the water even in a severe drought that could be experienced in a ten-year period. This might have been esthetically satisfying, but fishermen and sportsmen wanted more clearance. Some wanted the entire basin cleared. But most fishermen agreed that the submerged trees would offer an advantage to protect spawning fish. O. F. Huson, President of the Heber Springs Chamber of Commerce, formally presented a resolution asking for a clearance of timber to a point 50 feet below the lowest possible water level. Eventually, after listening to all groups and consulting with such authorities as the Game and Fish Commission, the Corps determined where to clear the timber.



**Sugar Loaf Mountain Nature Trail became part of the National Trails System in 1971 because it attracts visitors from throughout the United States. Built by District employees, it won a landscape contest sponsored by the Chief of Engineers in 1970.**

Another protest was eventually resolved through the courts. The Corps and Cleburne County could not agree on the replacement and routing of new County roads in the Greers Ferry reservoir area. The principal issue was whether or not a bridge should be built over the lower end of Devil's Fork. County Judge J. C. May contended that the bridge was essential to the people in the Prim and Brewer communities for a direct route to Stark and State Highway 16 on the south. The Corps responded that the light traffic of the sparse community could not justify a bridge. County Judge J. C. Crabtree filed an answer on behalf of Cleburne County to press for a bridge over Caney Creek as well as one on upper Devil's Fork. A compromise was reached with the County for \$462,500 in settlement for relocation of bridges and roads.

The Greers Ferry Dam Association, having been successful in securing the dam, had become the Greers Ferry Lake Association. It was to publicize the soon-to-be-created lake, to attract both businessmen, vacationers, and retirees in the area.

Even as the concrete pouring began there arose a serious protest from the fishing enthusiasts about the possible adverse effects that a dam would have on the existing fish life-cycle in the Little Red River. Gus Albright, a member of the Game and Fish Commission, exercising his rights as a private citizen, began a struggle over the character of the dam already under construction. In articles appearing in the State's leading newspapers, Albright demanded that the Corps redesign the dam so that water would be released from the top of the reservoir, rather than from the lower areas of the power pool as is normal. The contention of Albright, and numerous other fishermen who protested, was that the native fish of the Little Red were accustomed to warmer water, but would not survive colder water which would be released below the dam.

Albright and the other fishermen were convinced that the fish could not survive in the new environment, and thus the Little Red River, long known as a fine fishing stream, would be stripped of its prime attraction. When W. M. "Bill" Apple joined the fight through articles in the Arkansas Democrat, the Corps found itself receiving a flood of letters both supporting and rejecting the protests.

The initial Corps response had been that any change of plans would delay the completion of the project at least one year. The changes which would be necessary to release warm water, it said, would require an additional expenditure of at least \$1,000,000. Finally, Colonel Arthur M. Jacoby, Little Rock District Engineer, suggested that native fish could be supplanted by cold water trout, and fishing in the area would thus benefit from the retention of the native fishing above the dam and at the same time introduce trout below the dam.

The point of recreation as a project purpose is an inter-

esting one, for of course, the Mountaineer editor was correct then in his contention that the Corps projects were not designed to cater to recreational objectives. As originally envisioned, the Corps was created to construct defensive fortification, military roads, bridges, and other military oriented projects. Many, if not most of the older personnel connected with the Corps today, can remember when recreation was a "dirty word." Congress was opposed to the Corps getting involved in recreation.

The change in attitude came slowly and with reluctance. It was not until after World War II that the recreation concept became established. The combination of reservoirs and enthusiastic users of open water overwhelmed the Engineers. Wartime prosperity and an enlarged class of outdoorsmen began to buy boats, motors, trailers, campers, and other paraphernalia far beyond the dreams of depression-oriented outdoorsmen of the pre-war era. The Corps found itself in the position of caretaker of vast areas of recreational attraction. It had to establish at least minimum facilities at selected points for the public and devised rules to prevent despoilment of the shoreline and surrounding areas. State park authorities as the logical agents for this task were unprepared to accept the burden at that time. They were not equipped to handle large influxes to recreational areas without a period of training and experience.

The actual fixing of the burden of recreation fell on the Corps through Senate Bill 1362 of the 80th Congress, passed on May 29, 1947. A bill introduced by Senator Thomas of Oklahoma spelled out the terms under which the lands and waters within reclamation, flood control, power, and other Federal reservoir projects, could be put to recreational use. This bill was the first major step in legally fixing the Corps with recreational responsibilities. The Flood Control Act of 1944 had prepared the ground by authorizing Corps of Engineers to supervise the recreational facilities within its jurisdiction. At the time, the Corps of Engineers did not wish to retain exclusive control, or even permit control of recreational facilities, but rather saw itself as a transitional agency which would assume the task. The Corps contacted local communities, offering to lease them shoreline and hoped that these communities would develop and maintain these facilities for the benefit of their own citizens. The Engineers also expected communities to benefit from franchises to local concessionaires.

The plan did not work out as hoped. Only a few communities responded and many of these soon asked the Corps to resume its control and operation after the local benefits were found to be without the economic advantage they had expected. Many marinas did prosper, of course, but the Corps had to abandon the hope of having each community operate its own facilities.

The Greers Ferry reservoir was eagerly watched and anticipated by the outdoorsmen of the State and area.



Greers Ferry Dam on the Little Red River near Heber Springs, Arkansas.

Before the completion of the dam, the Engineers began filling the pool on January 1, 1962, and by April 13, when the last bucket of concrete was poured into the dam, the water elevation had already reached 388 feet, about 80 feet below normal elevation. Even though the powerhouse and switchyard would not be completed until July, 1964, the dam was in operation.

There remained only one major undertaking for the people who had worked so hard to secure the dam—a memorable dedicatory ceremony. Most of these ceremonies will draw attention to an area in proportion to the prestige of the honored guest. The Chamber of Commerce of Heber Springs, on whom had fallen the task of organizing and staging the dedicatory ceremonies, invited President John F. Kennedy.

Senator John L. McClellan, Representative Wilbur D. Mills, and others, headed up by Arkansas Governor Orval Faubus, called upon the President in Washington to request his attendance at the ceremony, who, by letter, accepted. The earliest date on which President Kennedy would be available was October 3, 1963.

Just before the President's helicopter landed on that day, someone checked the bathroom facilities in the house trailer rented for his comfort only to find that the commode would not stop running. As the President was coming down the walk toward his trailer a Corps employee was frantically bailing out the commode with his "hard hat" (safety hat).



Rainbow trout flourish in the cold waters below Greers Ferry Dam where Federal Fish Hatchery personnel stock the stream with catchable sizes.



President John F. Kennedy dedicates Greers Ferry Dam October 3, 1963, six weeks before his assassination.

The dedication ceremonies went well. In his address, the President bypassed politics except to praise the Arkansas Congressional delegation with these words: "I suppose pound for pound, the Arkansas delegation in the Congress of the United States wields more influence than any other delegation of any other forty-nine states."

In reference to Corps of Engineers flood control projects, President Kennedy made the following remarks on the cost of such projects:

"Which is more wasteful: the loss of life and property caused by floods or the cost of the multipurpose project which will ultimately pay for itself?

"Which is more wasteful: the failure to tap the energies of our stream and our rivers when new power is needed for new industry—or the construction of hydroelectric projects to serve the homes and farms and factories of this area?

"Which is more wasteful: to let land lie arid and unproductive and resources lie uncapped, while rivers flow unused — or to transform those rivers into natural water resources to alleviate those conditions?" The President concluded that the project would return to the nation and the Federal treasury far more than its original cost.

The pleasant impressions of the ceremony were especially memorable when 6 weeks later the President was assassinated.

President Kennedy's remarks, began to be borne out when private sectors began to invest in the area, especially the utility companies.

Prior to the construction of Greers Ferry Dam, Heber Springs did not have natural gas, and that shortcoming hampered the securing of industry for the area. The Arkansas-Louisiana Gas Company announced at the inaugural ceremony their plans to bring in natural gas for Greers Ferry with a 45-mile pipeline from Conway. The general feeling that prosperity had permanently encamped in the area, resulted.

The tremendous influx of construction and Corps personnel, and their families, during construction, had surpassed the capacity of the old school system many times. Because the increased enrollment was due to the Federal project, the Federal Government undertook to guarantee 75 percent of the cost of a new Junior-Senior High School.

Influx of tourists spawned businesses that catered to them and expanded older businesses as the permanent population increased.

Private capital developed "Eden Isle" on a hilly peninsula reaching into Greers Ferry Lake. It was the undertaking of Herbert L. Thomas, Sr., of Little Rock, whose idea was to create an exclusive planned residential community of 532 homes and an island paradise centered around a luxury resort called the Red Apple Inn.

# The Buffalo River

In stark contrast to the success of the Little Red River communities and their campaign to secure Greers Ferry Dam is the equally ambitious but fruitless attempt of the Buffalo River community to secure a dam for its area. Facing an even greater degree of economic stagnation in an area of chronic economic distress, its citizens sought a similar solution.

The untamed river was there, the same conservation needs could be fulfilled, and the hydroelectric market was still good. With the proven success of near-by projects to reinforce their arguments, Buffalo citizens may have become over-confident. Local leaders had participated in drives for other nearby projects, including the Bull Shoals and Greers Ferry Dam. They expected reciprocal support, and in 1957 they organized the Buffalo River Dam Association, which in 1959 later became the Buffalo River Improvement Association (BRIA). Opponents, mostly outsiders, quickly congealed into organized groups dedicated to preserve untouched, the Buffalo River as a national attraction. They said the Buffalo River was among the most beautiful of the wild rivers in the nation. Support came from such distant places as Kansas and Oklahoma, and from such prominent people as Justice William O. Douglas, who took a float trip down the Buffalo River as a guest of the Ozark Wilderness Waterways Club of Kansas City.

The Ozark Society sponsored a professional film showing the beauty of the Buffalo River, and gained free publicity in promoting a cleanup campaign along the Buffalo. Members of the Ozark Society would pick up trash and

litter along the Buffalo amid the whirl of cameras. James Tudor, editor of the Marshall Mountain Wave, President of the BRIA, and a supporter of the Dam, avowed in his editorials that the Society was, in fact, picking up its own trash and litter disgorged on previous float trips.

The Marshall Mountain Wave acted as the spokesman for the Buffalo River Improvement Association. Local meetings were called, petitions drawn up, and opponents were invited to come and listen, and be converted. Tudor and other local residents said guides had gone broke waiting for business on the Buffalo which was often dry for months at a time. A large resort in Newton County had held an auction to sell out its entire business.

As a compromise to the impasse, the various organizations supporting the Buffalo as a wild river offered to promote the idea of creating a national park out of the Buffalo River area. They said the Buffalo could be preserved and even enhanced as a national attraction, while at the same time the influx of tourists into the area would create the economic prosperity sought by the local citizens.

Local reaction was swift and vehement. Not only were the local residents unwilling to give up the idea of a dam and reservoir, they were furious with the idea of a national park. They felt that the park would attract no more people than were already using the area, and the landowners along the Buffalo would have to surrender important rights to the park. Furthermore, Marshall citizens knew from experience that campers usually

brought all their own supplies with them and left little behind except litter.

They wanted permanent residents and the type of enterprises which were attracted to reservoir areas. The proposed dam, they said, would not destroy the natural beauty of the Buffalo. Only 28 miles of the 159-mile Buffalo River would be affected by the dam. Float fishing would be improved, they said, for the best area would be below the dam, and this 50 miles would be enhanced by a controlled and dependable water source. Above the dam and reservoir the river would flow as it always had. Of the recognized scenic spots along the Buffalo, only one would be touched by the dam and reservoir.

The BRIA once again called for local meetings to give the citizens a chance to express their opinions, and the Marshall Mountain Wave roared with indignation. Backers of a national park alternative were distressed with the reaction, but proceeded with their campaign, assuming they were pursuing the only reasonable course of action.

With poetic skill Steele T. Kennedy described in an article which first appeared in the Ozark Mountaineer of June 1962 both the beauty of the Buffalo River and the problem of the area:

"The Buffalo is one of the few peculiarly important rivers in the nation left untamed; comparatively small but primitive and unusually majestic and potential, it plunges down from the top of the Ozark Mountains in Newton County and flows through Searcy County across the corner of Marion County to the Baxter County line. There 159 miles from its source, framing 1,333 square miles of rugged terrain, it wastefully pours 994,000 acre-feet of unused water into the White River each year. Just as the river gave life and succor to early settlers in this region, it now in a different way is the greatest potential for bringing a more abundant life to present and future generations of its people."

The awe-inspiring natural beauty along the hurrying, sparkling river will always be something for writers and naturalists to rave about, but that by itself is poor collateral for building highways and public schools, or for raising the standard of living within and beyond its watershed. This ancient rock-ribbed river left to itself would likely never change, not very much. But the area's economy and population do change, and, sooner or later, the river will have to yield, and so will its admirers.

In 1964 the Corps of Engineers encouraged the distressed communities by announcing its recommendation to construct the Gilbert Dam on the Buffalo River, a recommendation that was previously made in the 1930's. A few weeks later (Nov. 18, 1964), in Marshall, the Engineers conducted a public hearing—the start of a long grind to bring the project before Congress for approval.

The people of Searcy and Newton Counties were jubilant. Naturalists and sportsmen opposing the dam were

gratified to learn that the attendance at the little Buffalo River State Park was reported by the State Parks and Publicity Commission at 557,730. The editor of the Marshall Mountain Wave responded that on the basis of those figures, it must be concluded that 2,139 people visited the park for each of the 214 days that it was open during the year. A count revealed that less than 500 people visited the park on its busiest day of the year, the Fourth of July.

One dedicated and influential figure to give vigorous support of the Buffalo River communities in their bid for a dam was Congressman Jim Trimble. From the time of his election he did what he could to secure the Gilbert Dam. In 1962 he had tried without success to promote legislation authorizing the dam, and in July of 1965 Trimble, Oren Harris, C. C. Gathings, and Wilbur Mills all signed a letter addressed to members of the Rivers and Harbors Board of Review asking that a favorable report on the construction of the Gilbert Dam be made by the Board.

The cautious optimism of the Buffalo River communities bounded upward. In July 1965, the Corps of Engineers recommended the Gilbert Dam be constructed. It stipulated that a second dam at Lone Rock be omitted and expected this compromise would please the river-harnessing advocates and scenery lovers alike. It was rejected.

Governor Faubus informed the Engineers in December of 1965 that he opposed the Gilbert Dam. In March of 1966 Lieutenant General William F. Cassidy, Chief of Engineers, in a report to Army Secretary Stanley Resor announced that the Corps would abide by the Governor's wishes and withdraw its recommendation for the construction of Gilbert Dam. Secretary of Interior, Stewart L. Udall, announced that the Interior Department was very gratified by the Engineers decision.

The Searcy and Newton County citizens felt their issue was not yet settled so long as Congressman Trimble was willing to continue the fight, as he had announced. He was defeated for reelection in 1967.

The new representative, John Paul Hammerschmidt, announced that he would introduce a bill to designate the Buffalo as a national river.

Congressman Hammerschmidt supported his stand by sending out 168,000 questionnaires in the summer of 1967, and announced that of the 27,213 constituents who had completed and returned the form 34.9 percent favored protecting the Buffalo River in its natural state through the creation of a national river or national park.

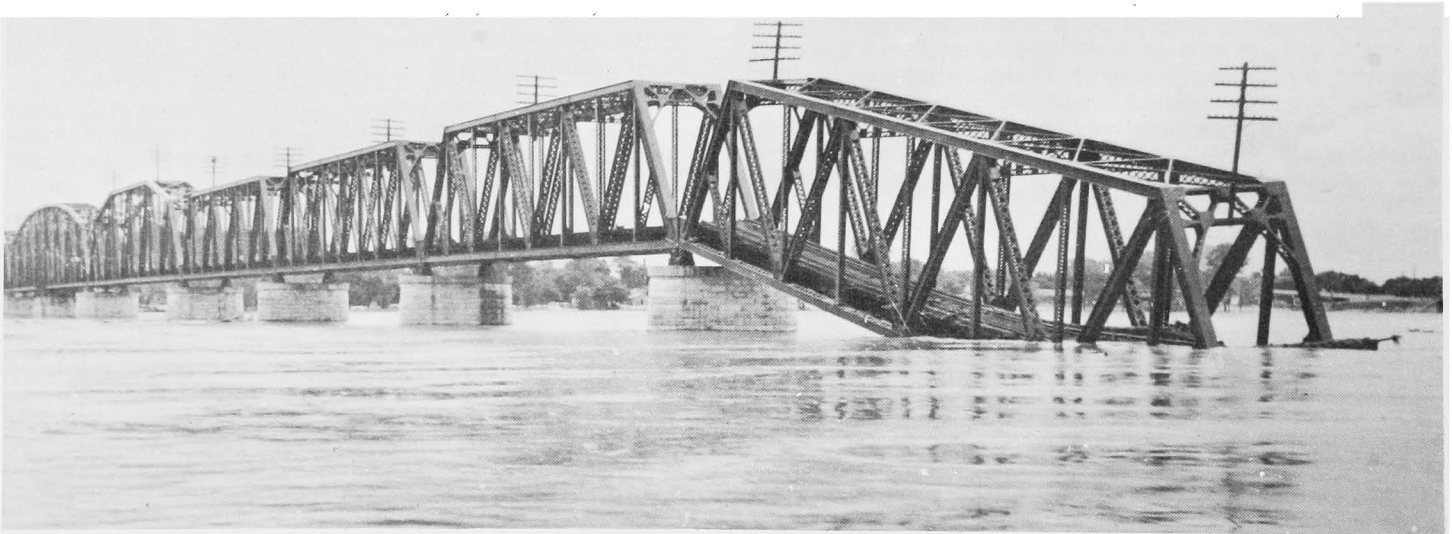
Senators McClellan and Fulbright also gave their support to maintain the Buffalo River in its natural state.

In the early spring of 1970 the Senate reported favorably on the assigning of National Park status to the Buffalo River, leaving the issue with the House Interior Committee for hearings and their recommendation.

# The Renaissance of a River

A central factor in the existence of the Little Rock District has been the Arkansas River. The river is the third longest in the United States, and is among the most capricious. Major General E. C. Itschner, speaking at the groundbreaking ceremonies at the Dardanelle Dam site in June of 1957, quoted Henry Van Dyke as saying, "It is with rivers as it is with people—the greatest are not always the most agreeable nor the best to live with." That remark is nowhere more applicable than to the Arkansas. But the confrontation between the Corps of

Engineers and the Arkansas River was a confrontation of two worthy opponents each determined to have its own way. From the pre-historic period to the near-present the river has acknowledged no master. It has cunningly allowed man years to install some restraining devices, to shore up weak banks, to build levees, to span its breadth with bridges, and even to divert its channel, only to wipe out his labor in hours with one surging rampage. The Corps of Engineers, on the other hand, was not seeking to destroy the river, but only to harness its



1943 Floods damage railroad bridge over the Arkansas River at Van Buren, Arkansas.

awesome energies and develop its channels for the benefit of man. Until the post World War II era the river won every round of the contest and it seemed that the Corps was vastly overmatched. The early history of the District and its activities was a study in futility.

It was not that the importance of the Arkansas was unnoted, or unappreciated; it was simply that the magnitude of the project was physically overpowering and, as far as Congress was concerned, in the early years of this nation it was financially impractical if not impossible. To stabilize the Arkansas as a highway for water commerce, it would be necessary to keep it within a predefined channel for the entire length of its anticipated usage, and it would be necessary to control the amount of sediment carried by the river in order to keep a channel clear. It would also be necessary to exercise control over the amount of water being drained into the Arkansas from secondary rivers.

Of these major problems, the greatest was that of channel control, for the Arkansas was constantly changing its channel, bypassing great bends in the river, washing away the constraining banks and making new channels. Even in normal times the erosive force of the river was impressive, but during times of flood the velocity of the river might reach a peak of 6 to 9 miles per hour. Under those conditions the thundering torrents could cause bank recessions of as much as 1,000 feet during a single high-water season. Whole farms might be submerged, then bypassed and isolated by the changing river bed. "Permanent" improvements usually lasted from one flood to the next, and then were rebuilt with a sense of resigned fatalism.

Still, during the heyday of river traffic when there was little alternative to river commerce, Congress hoped the Engineers could keep the river open by constant snagging and dredging operations. In 1888 Congress authorized an ambitious plan with the objective of maintaining a six-foot channel below Little Rock and a two-foot channel above Little Rock for a total length of 772 miles. The financial support simply was not up to the task at that time, and with ever increasing expansion of railroads, the whole project was quietly abandoned before 1900. Thereafter the Corps activity on the river was largely confined to snagging and only great disasters or national emergencies returned attention to the river. By 1933, with the Flood Control Act of that year, it seemed that a new point of national awareness and determination had been reached. That Act gave approval to a general comprehensive plan for flood control in the Arkansas River Basin. The 1938 Act also authorized the Secretary of War and the Chief of Engineers to modify the general plan.

The Act was a step in the right direction. President Roosevelt added encouragement to the supporters of river improvements when he gave his unqualified endorsement



1942 Floods on the Arkansas River destroyed thousands of acres of rich farmland which caved into the river and was washed downstream, like this area near Little Rock.

of a proposed Arkansas Valley Authority.

The Engineers had only begun the improvements authorized by the 1938 Act when World War II broke out, however, and all civilian projects nonessential to the War effort were curtailed for the duration. The only consolation that Roosevelt could offer the Arkansas Valley Authority was that the river project would be rated high as a peacetime priority, and with that the delegates had to be content.

The major flood of 1943 brought more attention back to the river, enough to override wartime emergency. The Engineers were requested to make a detailed study of the river problem, and submit a plan to harness the river.

To justify its expenditures, any plan would have to show the benefits to be derived. Besides flood control, the Engineers included hydroelectric power and restoring the river as an avenue of commerce. Without hydroelectric power and navigation the benefit-cost ratio would close the door on any program of flood control.

The Engineers went to work on a new multipurpose plan for the Arkansas River. By 1945 the Chief of Engineers had the comprehensive plan on the Arkansas River ready for submission to Congress. It was breathtaking in its concept, magnificent in its scope, sound in its engineering, and practical in its economics. Its breadth included flood control, hydroelectric power, navigation and such diverse benefits as storage of water for municipal and industrial use, sportsman activities and fish and wild-life conservation. Ultimately the Corps of Engineers was able to justify a conservative benefit-cost ratio of 1.5:1 based on a project life of 100 years.



1943 Flood on the Arkansas River at Fort Smith, Arkansas.

This comprehensive plan was submitted to Congress and was approved in the River and Harbor Act of July 24, 1946. The Act was signed by President Harry S. Truman, as another milestone was reached. The Corps had estimated the total project to cost over \$1 billion and Congress appropriated \$55 million to get it started.

The plan as submitted by the Corps and authorized in the River and Harbor Act of 1946 is essentially the same plan that was brought to completion in 1970. This plan envisioned a nine-foot channel beginning at the juncture of the White River and Mississippi River in eastern Arkansas. The channel was to proceed ten miles upstream on the White and enter into a man-made, 10-mile-long Arkansas Post Canal. It was then to continue across the State of Arkansas within the Arkansas River bed and into Oklahoma to Muskogee where it would leave the Arkansas River and proceed the last 50 miles on the

Verdigris River to a point near Tulsa from the Mississippi River to Catoosa, Oklahoma. In order to control the Arkansas it was determined that the essential construction had to encompass 28 reservoirs, 55 local protection works, 23 locks and dams, and extensive bank stabilization work.

In the original concept of a waterway, the city of Tulsa, Oklahoma was a logical terminus for a navigational channel. It was obvious to the Engineers that the Arkansas River at Tulsa was 90 feet higher than the Verdigris River at Catoosa, east of Tulsa. Using the Arkansas River as a projected channel, it would have required 11 locks and dams to complete navigation upstream from Muskogee. The Tulsa terminal at Catoosa, on the Verdigris, saved the construction of 9 locks and dams.

Because the river improvements were located within two separate Engineering Districts, the division of the

project was made along the lines of the District. The Tulsa District would superintend the project eastward to Fort Smith, and the Little Rock District would superintend the project from that point to its entry into the White and the Mississippi. Improvements began nearer the headwaters of the project, meaning that the first expenditures would be made by the Tulsa District. The first appropriation, the \$55 million, carried with it the specific instructions that the money first be used to build the Eufaula Dam in Oklahoma on the Canadian River. The Little Rock District was disappointed but the sequence of construction was undeniably logical.

Why the Eufaula Dam in particular? Sediment studies and tests had shown that the Arkansas River car-

ried within its flow a fantastic proportion of sediment. In an average 24-hour period about 33,000 tons of sediment flowed past Little Rock. Over the period of a year that means that about 120,000,000 tons flowed by the city. In terms of maintaining a navigable channel, this represented a gigantic problem as the sediment would tend to clog channels, as well as create problems in operating machinery.

Further investigations showed that the majority of the flowing sediment entered the Arkansas channel from the Canadian River in Oklahoma, thus it was natural that a dam be placed across that river, trapping the sediment. Naturally, the Eufaula Dam would help regulate flow into the Arkansas and also produce hydroelectric power.



Bank Stabilization on the Arkansas River keep the meandering river within stable bounds.

Other dams within the Tulsa District, the Oologah on the Verdigris, the Tenkiller Ferry on the Illinois, the Pensacola, Markham Ferry, Fort Gibson on the Grand (Neosho) River, and the Keystone on the Arkansas River will also serve to trap some sediment, store flood waters, regulate the flow of water into the Arkansas, and produce hydroelectric power.

Although the District could not begin major construction, its personnel were making detailed studies of the river, testing sites for the locks and dams, and trying to unravel problems of land ownership. An aid in property settlements was the photographing of the entire length of the Arkansas channel within the State of Arkansas. This superb collage of aerial photographs is mounted around the four walls of the District mapping room in Little Rock and permits one to "see" the river in detail for well over 300 miles of its length in Arkansas.

Regardless of what could be seen on the wall, most Arkansas leaders were concerned about what could be "seen" in the "Tulsa First" policy. Congressional representatives were asked to get the project underway in Arkansas. The immediate need was to raise the \$55 million ceiling put on expenditures by the 1946 Congress. In 1949 Congressman W. F. Norrell introduced legislation designed to permit the Little Rock District to initiate the project in Arkansas. His efforts were being coordinated with Senator McClellan who, as Chairman of the Senate Subcommittee considering appropriations for the project, was in a favorable position to expedite it. Basically, the Arkansas delegation wanted appropriations for an additional \$1,100,000 to start the Dardanelle Lock and Dam; \$2,000,000 to start bank stabilization work, and \$300,000 to eliminate a sharp bend in the river near Morrilton. The real problem of obtaining approval seemed to lie in the House of Representatives which was less inclined to think in terms of massive appropriations. The Chairman of the Arkansas delegation, Reece Caudle of Russellville, tried to explain the position of Arkansas and said that Arkansas did not begrudge the money being spent on the Tulsa phase of the project, but only wanted to get the project underway in Arkansas as well. "We think it is time to proceed in Arkansas. Up until now not a dollar has been spent on the Arkansas plan in Arkansas."

The \$3.3 million requested of the 1949 Congress was translated into the River and Harbor Act of 1950, which raised the ceiling to \$136 million but Congress did not appropriate any funds.

The various River and Harbor Acts indicated what would be required of local communities. Local interests were told they would have the responsibility for providing port, terminal, and transfer facilities if they were to partake in the new era of river transportation. The Federal Government assumed responsibility for the cost of all altered highway routes and railroads. Some cities already had existing terminal "facilities," adequate to the

needs of river commerce as it existed at that time. The city of Little Rock owned a paved bank slope, and there were some privately owned log slips at sawmills and stave mills, and sand and gravel derricks and elevators at Van Buren, Dardanelle, Little Rock, and Pine Bluff.

Just as Congress was indicating a willingness to appropriate more money and enable a more rapid development of the river project, the Korean conflict in 1950 returned the Little Rock District back into a military posture. Activity was not as feverish as it had been during World War II, but there was a demand for military emphasis and curtailment of civil projects. Congress chose to appropriate \$1 million to initiate the Dardanelle phase of the project. But President Truman did not take the same attitude toward the conflict, and immediately ordered the funds frozen.

In the meantime the Arkansas River Basin Association had been formed to promote the Arkansas River project. The Association organized and coordinated various civic groups seeking fulfillment of the project and served to keep the issue of the project before Congress. The Association decided that its major effort should be directed toward securing funds necessary to begin, if not complete, the bank stabilization part of the project. Fred A. Smith, Executive Director of the Association, led a delegation to Washington in early 1952 to get the project moving again. Specifically, the Association wanted Congress to appropriate \$12 million for bank stabilization on the Arkansas River. The Federal budget had included \$2 million for the work, but the Association, back by statistics, was certain that the sum was pitifully inadequate. Colonel Hans W. Holmer, Little Rock District Engineer, gave two examples of the pressing need of bank stabilization work on the Arkansas River. He noted that the river had recently cut away 200 feet of the river bank at a point in Conway County, and he said that at another point, 16,000 acres of land were threatened with flooding. Colonel Holmer said that a flood gate, costing \$120,000 would solve the problem of the flooding.

Members of the Association were unhappy over the fact that the House Committee on Appropriations had turned down their previous request for funds for bank stabilization as well as funds required to initiate the planning stage for several of the dams. Captain C. W. Thomas, Commandant of the United States Coast Guard District II, supported the demands of the Association, saying that the development of the Arkansas River was essential to the industrial and military future of the United States. He believed that industry should be located centrally in the nation if vital plants were to be protected from missile attack, and that industry itself would have to move in that direction because of the dwindling water table along the coastal areas.

The year 1952 proved to be a critical year for finan-



Schoolboys on Skip Day head for the shores of Lake Dardanelle on the Arkansas River near Russellville, Arkansas. There are 22 recreation areas around the lake.

cial action. President Truman's budget fell far short of what the Arkansas delegates considered essential to the bank stabilization program. Senator McClellan announced that he would ask for \$7 million more than requested by Truman's budget, and supported his request with a new report by the Corps of Engineers. The report showed that stabilization work was in critical need for at least nine points along the river. Senator McClellan distributed copies of these reports to Representatives Norrell and Hays in the House of Representatives and requested that they initiate the move for additional appropriations in the House. Former Representative David D. Terry (1933-1942) was on hand to support the demands with a film showing large sections of banks caving into the Arkansas River. The House Appropriations Subcommittee viewed the film, and heard the appeals of various interested groups and associations in the weeks following. By February 23, 1952, groups of Arkansans were demanding ever increasing sums of additional appropriations for

bank stabilization work. The request jumped from \$7 million, to \$8 million, to \$12,332,000 and finally to \$14 million by the end of March. One group pointed out the "folly" of building set-back levees instead of more permanent structures to combat bank caving.

After hearing all the arguments, viewing the films, and considering the urgency of the situation; the House Appropriations Committee recommended that the \$2 million originally recommended by President Truman be appropriated. In unusual moves the House upped the appropriations from the recommendation, and voted in \$5 million for the program, then the Senate upped the appropriation to \$7 million and the Budget Bureau was authorized to release that amount into the bank stabilization program of the Arkansas River project.

While the ultimate decision was considerably less than had been demanded, it represented an even greater success than could be reasonably anticipated. Congress was slashing appropriations in that year. This particular Pres-



Groundbreaking for Dardanelle Lock & Dam June 12, 1957. Left to Right: Senator John L. McClellan; Congressman Brooks Hays; Major General E. C. Itschner; and Senator J. W. Fulbright.

idental appropriation request was being increased beyond his request, while Congress was cutting the national flood control money by 28 percent. The river and harbor projects for the entire nation was cut by 34 percent, and appropriations for a dam and drainage project on the St. Francis River were denied entirely. The Appropriations Committee stated in no equivocal terms that "the civil works program should be subservient to the defense needs of the nation," and recommended that no new projects be started during the existing (Korean) emergency.

The success of the Arkansas legislation in maintaining and augmenting the appropriation recommended by the

President was due in no small part to the President himself, for in spite of his original action in freezing the funds for the Dardanelle project in 1951, President Truman had come around to accepting the argument that the Arkansas project was "necessary to the defense effort." Representatives Brooks Hays and Jim Trimble had urged him to accept this position in trying to get the President to release the Dardanelle appropriation. The President's endorsement of the program as part of the defense effort undoubtedly had much to do with the success of the appropriation effort. Representative Hays said of the President's endorsement that his action was "highly significant," because the project supports now had valuable support from the administration and from the Army Engineers in the quest for Congressional appropriations.

The bank stabilization program was initiated, even though the locks and dams were still in the planning stages. By the end of 1952, it could be reported that bank stabilization projects were well underway at Dardanelle Rock, to Reed's Ferry, upstream to Morrilton Cutoff to downstream Morrilton Cutoff, and White Bluff to Jefferson County free bridge.

The development of the Arkansas River multipurpose project from that time forward was tethered to the struggle for funds.

The end of the Korean emergency and post-war demands for economy has conspired together to tighten up the economy and reduce civil projects. It was during the Eisenhower era the river project suffered even more than usual from economic famine. By 1955 requests for bank stabilization funds were being cut by two-thirds and more, and the House Appropriations Committee was refusing to grant money for the beginning of construction of the Dardanelle Dam. Once again this brought about another seige of lobby activity by river project supporters. The House reinstated much of the money that had been cut from the project, and Representative Ed Edmonson took advantage of the mood reversal by offering an amendment providing for \$450,000 to begin construction on the Dardanelle Dam, and the same amount for the beginning of the all-important Eufaula Dam in Oklahoma. The Amendment passed by a vote of 112-87, and the bill was sent to the Senate where the Dardanelle amendment was also approved and the bank stabilization appropriation was upped beyond the amount adopted by the House and requested by the Budget Bureau. Senator McClellan, in a joint statement with Everett T. Winter, Executive Vice President of the Mississippi Valley Association, explained that the Corps of Engineers was usually conservative in preparing their cost estimates, and that the Corps was equally conservative in preparing their cost ratios. The expenditures would be more than equalled by the benefit derived.

The more dams that could be completed or at least well underway in the Tulsa District, the more practical



Working model of Dardanelle Lock, Dam and Powerhouse, built by District employees was displayed at the Worlds' Fair in New York

became the dams on the Arkansas in the Little Rock District. Work on the Oologah Dam had begun in 1950, but was stopped by civilian curtailments of the Korean war. As a result of the 1955 appropriations, the next year witnessed the resumption of work on the Oologah Dam, and the Eufaula and Keystone projects were commenced, thus the proper sequence for the Arkansas projects were underway at the same time that the preliminary work for the Dardanelle Lock and Dam project was initiated. The Dardanelle Dam could not be closed until the key dams in the Tulsa District were in operation.

It was in June of 1954 that Colonel Staunton L. Brown arrived to assume the post of District Engineer. Since Colonel Brown's tenure coincided with the commencement of the Dardanelle Lock and Dam, he would be one of the District Engineers who guided and pushed construction on the project. Colonel Brown was kept at his post for four years, during which time he and his family developed lasting friendships and established a personal

fondness for the area. As with several other District Engineers who were concerned with this project, Colonel Brown returned to make Arkansas his permanent home upon his retirement in 1963.

The sequence of construction of the river projects was determined by different standards in the Little Rock District. In this District the sediment problem was not as much a factor as were the Tulsa projects designed to minimize the problem. Logically a good starting point would be Lock and Dam No. 1, working upstream from that point, taking advantage of the navigational facilities to move equipment upstream.

As the District began to let contracts on the various locks and dams, contractors either utilized existing roads or built them if they were not. In some cases the Corps itself assumed the burden of surfacing access roads, and relocation of highways and electric transmission lines. The general criteria was whether or not it was the project that made these improvements necessary. Once a project



**Large suction dredges remove shoals from Arkansas River Navigation Channel below Toad Suck Ferry Lock & Dam near Conway, Arkansas.**

was completed and accepted by the District the new access roadways were turned over to the counties for maintenance.

River stabilization continued to be the major effort while locks and dams were being planned. Plans, specifications, and cost estimates were checked again, and much use was made of the Waterways Experiment Station at Vicksburg. Scale models were used to test flow patterns

and bank stabilization needs. Unsatisfactory foundation studies for Ozark Dam caused the Engineers to move the site ten miles downstream eliminating Lock and Dam No. 11. Dr. H. A. Einstein, son of Dr. Albert Einstein, had also been called in for consultation on the project. The remainder of the locks and dams kept their original numerical designations.

Realignment of the channel included the bypassing of

tight loops and sharp bends in the river. In all, the river route was shortened 40 miles. The strides of modern technology enabled a progress beyond the wildest dreams of the early District Engineers. In the 1890's the only type of equipment available for dredging out channels or removing solid embankments was the old dipper dredge. That dredge was essentially a steam shovel on a barge, and utilized chains as the strongest possible flexible line available at that time. The old dipper dredge usually operated a bucket capable of scooping up about one cubic yard at a time. Using that piece of equipment it was considered a "pretty good day's production" to move a thousand cubic yards of material. During the 1920's and 1930's, the size of the bucket increased to an average of three cubic yards as modern, tough, and flexible wire cables replaced the brittle chains, but the dipper dredge was still basically the same. As the Arkansas River project progressed, the age of technology came in digging the Fourche Cutoff. A huge dragline was hauled in by McGinnes Brothers, Incorporated, of Houston, Texas. The cutoff was to be a 240-foot ditch, varying in depth from 30 to 34 feet, a job that might have taken years to complete using old equipment. The McGinnes dragline had a scoop capacity of 11 cubic yards. It completed the cutoff in eight months.

Even the capacity of this mammoth machine was dwarfed by the amount of material handled by the new suction dredges. While the Corps often counted on the river itself to scour away the new channel as partially opened by the contractors, it was sometimes necessary

to fill in some areas and remove the loose material under the flowing water in other areas.

The modern suction dredge was used to complete dredging on the Arkansas River. The suction dredge was essentially a vacuum cleaner, sucking up the sand, mud, and water; transporting it through large diameter sections of pipe to "spoil" areas for deposit, all in one process.

The modern 27-inch suction dredge could move approximately 1,500 cubic yards of material each hour. In 1967 the Little Rock District advertised a contract calling for the removal of 21,400,000 cubic yards of material and specified a time limit of about four months. That would have entailed 60 years of work by the old dipper dredge.

Bank stabilization, though less dramatic than dam construction, became an important task of the District.

The Arkansas River did not submit to regulation without frustrating the District and its contractors. For example, bank stabilization at Waring's Bend, south of Little Rock, had been completed when flood waters swirled in behind the work, undermined the pile footings; and washed out the whole works. There were other setbacks, but most of those occurred while work was yet in progress.

As with the machinery, new methods and innovations were rising to meet the challenge of the river. New pile drivers were now capable of driving the piles (approximately same size and diameter of telephone posts) at an amazing speed. At Waring's Bend, for instance, the new piles were driven 30 feet below the bed of the river, usually in less than 10 minutes each. Afterwards, follow-

#### OFFICIAL STAFF LITTLE ROCK DISTRICT, CORPS OF ENGINEERS



SEATED, left to right: David R. Rippey, Chief, Engineering Division; Harold R. Fredrickson, Jr., Chief, Procurement and Supply Division; Lt. Col. Robert W. Glenn, Deputy District Engineer; Colonel Dale K. Randels, District Engineer; Charles E. Burcham, Chief, Real Estate Division; and Theodore S. Cook, Chief, Construction-Operations Division.

BACK ROW, left to right: David R. Gaddis, Comptroller; Edward O. Fryar, Chief, Program Development Office; John H. Snow, Jr., Chief, Office of Administrative Services; William C. Marak, Chief, Automatic Data Processing Center; Marion Taylor, Equal Employment Opportunity Officer; Jack J. Wilks, Safety Officer; Dallas R. Lynch, Chief, Security-EOP Office; John J. Mawn, Chief, Public Affairs Office; Robert L. Jones, Personnel Officer; and E. Terrell Wortman, District Counsel.

ing the usual procedure, the piles were tied together horizontally at the top (using noncorrosive heavy copper wire), then large stones were dumped in forming an embankment around the piles. River currents deposit silt and debris in the crevices to form a new bank. Behind this new bank calm waters release suspended sediment. In time the areas fill with sediment, becoming prime farm land, and in the meantime the river is forced to follow the channel restricted by the dikes.

By constricting the river channel to a narrower bed, the river current scours the channel to navigation depths and reduces dredging operations. Naturally, the river was less stable in the rock-free alluvial valley downstream from Little Rock, and proportionately greater efforts were required there to contain the river. The average land lost per river mile through caving upstream from Little Rock was two acres and downstream from Little Rock was 7.65 acres.

If property lines were in dispute before channel rectification was undertaken, then surely the situation was aggravated afterwards. Although farmers and other property owners were accustomed to the river's changing ways, it was only natural that they would seek compensation when the Engineers channel improvements affected their land.

A farmer in Jefferson County brought suit for \$10,000, basing his claim on the loss of 35 acres of his 225-acre farm, and alleging that he would not have suffered this loss were it not for the new channel created by the Corps. In court, the Engineers proved that if it had not been for the river improvements, the surging river would have swept away practically all of the farmer's low pasture. Charts were produced to show that the river had been in the process of eroding away the complainant's land previous to the construction and that his land had actually been improved and stabilized by the Corps improvements. The courts long ago set precedents that the Government could not be held responsible for losses suffered by individuals when improvements were being created for the benefit of a larger community of people or, as in the case of the Arkansas project, an entire region.

On April 1, 1958, Colonel Arthur M. Jacoby succeeded Colonel Brown as District Engineer. Colonel Jacoby, too, would be deeply involved with the Arkansas River project, and would be the District Engineer during 1958-1960. Like Colonel Brown, Colonel Jacoby set down roots and made many friends, and upon his retirement he purchased a piece of property over-looking Lake Dardanelle and built his home there.

Colonel Jacoby was succeeded by Colonel John C. Dalrymple who assumed the post in August of 1961. Colonel Dalrymple remained at the post for less than a year as he was promoted to Brigadier General and appointed Chief of the North Atlantic Division. The vacated position was filled by Colonel Charles D. Maynard, who was District

Engineer during 1962-1965.

Colonel Maynard had studied under Colonel Staunton Brown at West Point, and the association was carried further when Maynard, like Brown, also chose to make Arkansas his home upon retirement.

By 1960 Congress was voting more and more funds for the continuation of the Arkansas project, but the battle was not over by any means. In a speech before the Little Rock Chamber of Commerce, Donald O'Toole, a Chicago financier and president of the Mississippi Valley Association, exhorted Arkansas and other interested people to keep to the task, and to consider the argument that the failure to complete the program would be a shameful waste of national resources. It would amount to a weakening of the "second line of American defense," i.e., a viable and vigorous economy, one that could command leadership in the world's trade markets and one that could meet the competition for increased trade. Colonel Robert R. Robertson echoed his sentiments, observing that "History is replete with chronicles of civilizations that have risen and fallen as they succeeded or failed in their efforts to develop and maintain water resources:

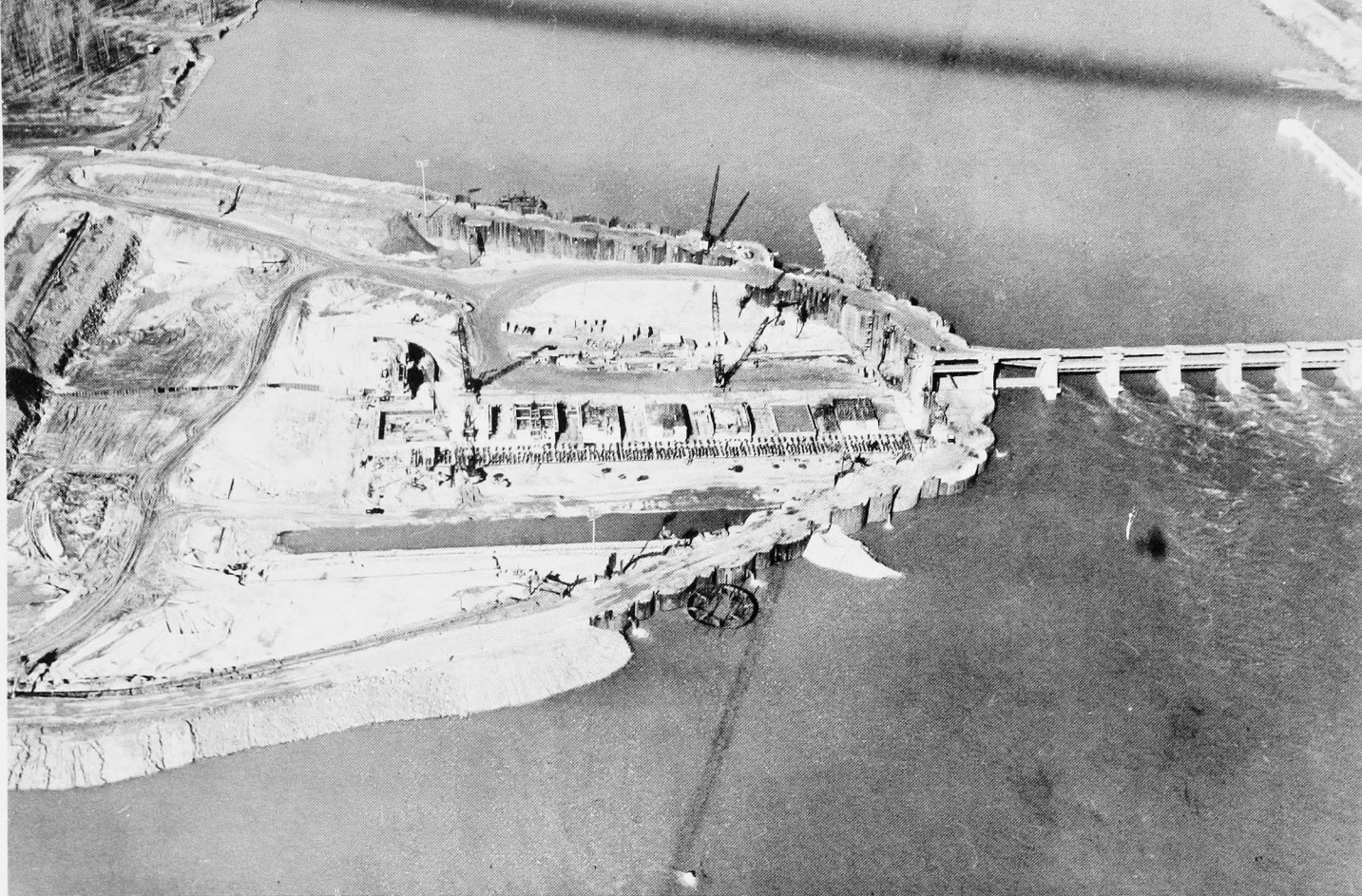
"It is of more than academic interest that the advance of early western civilization followed the development by those surprisingly competent Roman Engineers of water supply projects throughout Africa, Europe, and Western Asia. Of even greater significance is the fact that destruction by the Goths and the subsequent neglect of these great water systems was a major contributing factor to the decline of the Roman Empire. We must see that false economy does not do to our civilization what the barbarians did to the Roman Empire."

The people did stay behind the project, and the governmental leaders had the foresight to understand its importance to the regional and national economy, and to the ever increasing demand of the water supplies of the nation.

In 1960 construction began on the low-lift locks and dams. Work on the first stage of the Dardanelle Lock and Dam was essentially completed in that year, and a contract was awarded for the building of the spillway.

The election of John Kennedy in 1960 and his proclamation of a "New Frontier" policy added further national support followed accordingly. Along with the new era came new quarters for the Little Rock District headquarters: On Friday December 14, 1961, personnel began the move into a spacious new Federal building on Capitol Avenue in Little Rock. For the first time since the District had been recreated in 1937, all of the District Office personnel were under one roof.

The Corps of Engineers had expanded and contracted as national emergencies arose, but the trend was for greater and greater service, and with corresponding increases in full-time personnel. This normal expansion had meant that by the early 1960's District personnel were scattered in four separate buildings — the Gay Building, the Lyons Build-



**Second stage cofferdam protects construction area of Lock & Dam No. 3 on the Arkansas River near Swan Lake, Arkansas. February 1968.**

ing, 555 Building on Broadway, and the Harrel Building on Third Street.

The new Federal Building was to include other governmental offices and services, but the Engineers were comfortably located on the 6th and 7th floors, with parts of the 1st, 3rd, and 5th floors being used as needed. Over 4,000 pieces of furniture and equipment were moved with typical engineering efficiency, and within three days it was "business as usual" for the District Office employees.

In his first annual budget request President Kennedy asked Congress to allocate the full sum of money requested by the Basin leaders, and even though Congress did not always honor the President's request in full, the total project now had full support. The deadline for the completion of the project, announced by Major General E. C. Itschner, Chief of Engineers, in 1956, was revived, so the year 1973 became the target date.

Since the Little Rock District was simultaneously dividing its energies with the White River projects and other major dams, the District made arrangements with other Districts to take some of the workload. In February of

1961, the Vicksburg District retained responsibility for maintaining the existing levees and revetment works along the lower portion of the Arkansas River below Pine Bluff, and the Little Rock District became free to devote its energies to channel improvement and stabilization. A few months later the Tulsa District was assigned the job of designing all the locks on the Arkansas River navigation project, except the one which was already under construction at Dardanelle, leaving the Little Rock District with the designing of the dams. The Tulsa District was acting as a subcontractor for the Little Rock District, a common intra-governmental procedure. The Tulsa District later had to share this workload with Fort Worth, Texas, and Buffalo, New York, Districts.

By 1962, under the now accelerated program, planning and design of several of the lock and dam projects were either complete or in the final stages. Core boring at the sites was under way in 1962. In 1963 contractors were doing preliminary work on Lock and Dam No. 1, and at Lock No. 2, with the other contracts being let in rapid succession after that.



The present District Offices are located in the Federal Building in Little Rock. (Center)



Dedication ceremony at Dardanelle Lock & Dam May 13, 1966. Congressman James W. Trimble is at the lectern.

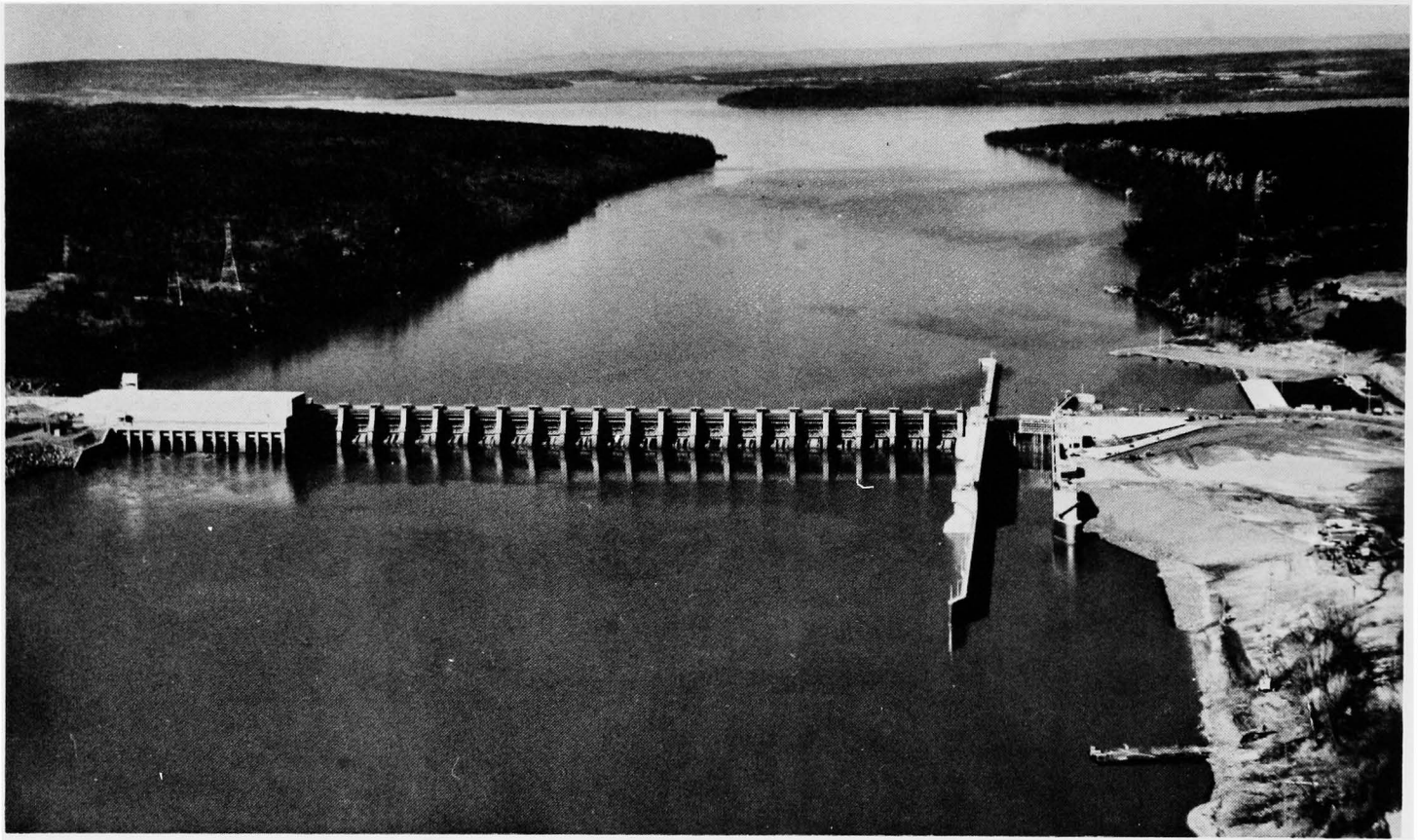
Each construction site was unique. The construction projects upstream from Little Rock were more predictable because the solid rock bedding was closer to the surface. In the alluvial plains downstream from Little Rock, the contractors faced problems of shifting sands and embedded clays. Contracts allowed for some adjustments for unforeseen conditions.

In June of 1964 construction work began on Lock and Dam No. 3, and Lock No. 2. Lock No. 2 was a special situation in one respect, for of all the locks and dams in the project in Arkansas it was the only one that was not constructed in conjunction with the dam. Dam No. 2, in fact, was located on the Arkansas River at Notrebes Bend, just below the point where the Arkansas Post canal diverts the navigational channel to the White River, while its companion lock was located on the Arkansas Post canal itself, about ten miles distant.

Also in 1964 construction was begun on Lock and Dam No. 4 at Pine Bluff, Arkansas. To the people at Pine Bluff the final taming of the river held special significance, for of all the major cities on the river, Pine Bluff had suffered most.

Pine Bluff seemed to have been the special target of the river especially in times of flood water. The early District Engineers, such as Captain Taber, had tried valiantly to erect "permanent" improvements to save the city, but the river remained unperturbed in its independence of action until the sharp bend was bypassed by a new navigation channel. The locks and dams along the Arkansas River itself were not designed for flood control, but rather for navigation and power. Once the reservoir pools had filled to their operating levels, the river continues to flow through the dams unhampered and as it has always flowed.

In 1965 Colonel Maynard retired to be succeeded by



Dardanelle Lock & Dam and Powerhouse near Russellville, Arkansas. The 54-foot lift of the lock is the highest lift on the McClellan-Kerr Arkansas River Navigation System.

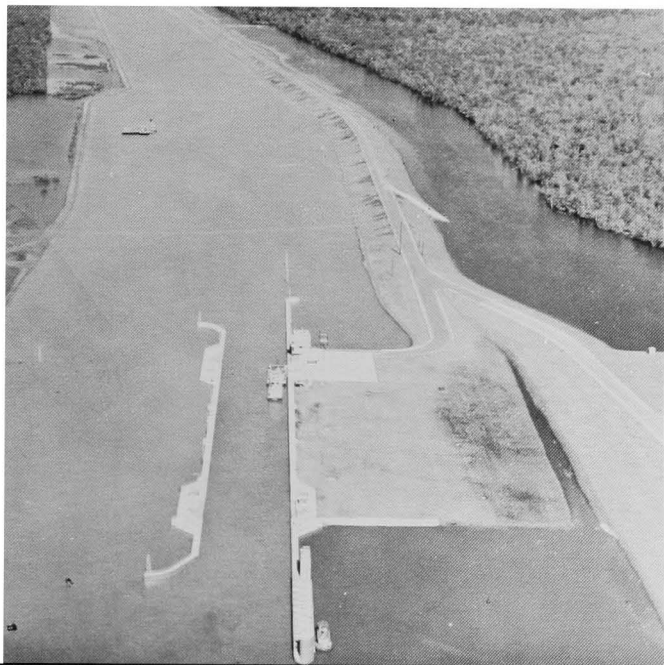
Colonel Frank P. Bane. Although Colonel Bane would be the District Engineer who would preside at the opening of the first lock and dam, he, like all of his predecessors, was quick to reject any personal credit for the accomplishment, noting that his predecessors had "done their homework well," and he had only to continue what they had started.

In 1965 and 1966 the remainder of the Arkansas River projects within the Little Rock District was placed under construction. Lock and Dam No. 6, named after one of the most consistent supporters of the project, David D. Terry, was started in January of 1965. In March work began on Lock and Dam No. 5, located just below a difficult river loop known as Brodie Bend. Brodie Bend was one of those loops bypassed by the District in the interest of a shorter and better channel. In April, just one month after construction had been initiated at Lock and Dam No. 5, work

began on Lock and Dam No. 7, located at Little Rock near Cammack Heights. This dam is near an attractive wooded bluff where a visitor center and observation point are planned.

After construction was initiated on Lock and Dam No. 12 (Ozark) in June of 1965, and Lock and Dam No. 8 in December of 1965, Lock and Dam No. 9 in January of 1966, and Lock and Dam No. 13, in April of 1966, Colonel Bane announced that the great Arkansas River project had reached the half-way point, considering the work that had already been accomplished. Job applications were being received from persons interested in operating the locks and dams, with the stipulation that while no experience was required, applicants had to be in good physical condition and be able to swim.

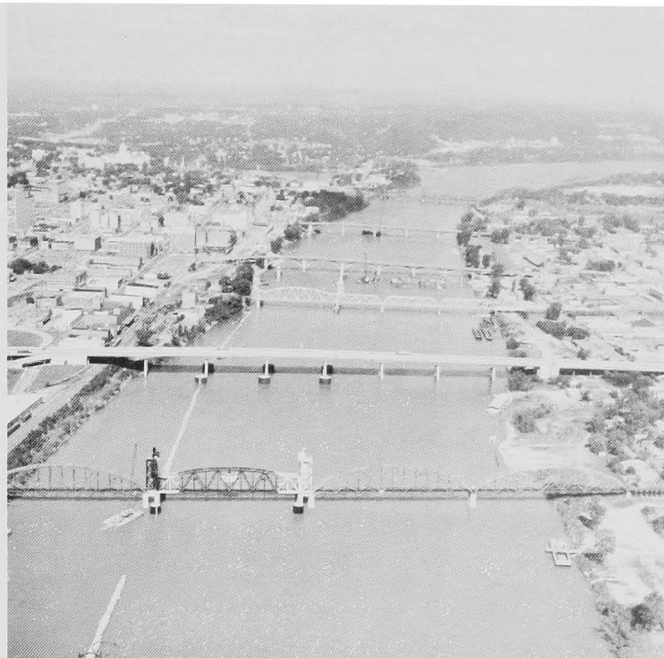
The question of the existing bridges and their effect on orderly traffic on the Arkansas was a critical one. In 1965



Norrell Lock & Dam at the confluence of the White River and the Arkansas Post Canal, experiences high Mississippi River and White River stages that allow river traffic to pass without locking through.

the Army Engineers believed that it would be necessary to replace only six of the 17 highway and railroad bridges across the Arkansas River, that the remainder could be altered to permit barge traffic to travel under them. The minimum clearance specifications on which the Corps based the river traffic was a horizontal clearance of 300 feet and a vertical clearance of 52 feet. Little Rock presented a special problem, because while some of the bridges could accept barge traffic, the channel could not be aligned with those openings as they existed. Pulaski County Judge Arch Campbell had once actively advocated that a tunnel be constructed under the Arkansas for vehicular traffic between Little Rock and North Little Rock to alleviate the problem. The amount of traffic was insufficient and the proposal was shelved.

In mid-1967 Lock and Dam No. 1 was completed. On June 2, Colonel Bane, accompanied by the contractor, various dignitaries, interested citizens, newspapermen, and District employees, rode the first tugboat to be "locked through" Lock and Dam No. 1 at the entrance to the Arkansas River project. As though to symbolize its last gesture of defiance, the Arkansas River provided such an abundance of water that on this particular occasion the Lock and Dam was functioning, but the water was as high on one side of the dam as on the other. The lock and dam was accepted by the District with only a few minor reser-



Six bridges at Little Rock needed altering or replacement to accommodate modern barge traffic on the McClellan-Kerr Arkansas River Navigation System. In all, 16 bridges in the District were to be altered or replaced.

vations concerning a restraint chain on a walkway and the placement of a light.

When Colonel Bane left in December 1967, the total navigation program was 65 percent completed, and the annual operating and construction budget for the District was averaging \$100 million.

In 1967, Colonel Charles L. Steel replaced Colonel Bane as District Engineer. He was in command when the Arkansas River was opened for navigation, an occasion that was celebrated with the official ceremonies marking the dedication of the David D. Terry Lock and Dam, October 4, 1968. With the closing of that dam the reservoir pool backed up to Little Rock, and navigation of the lower portion of the Arkansas was possible.

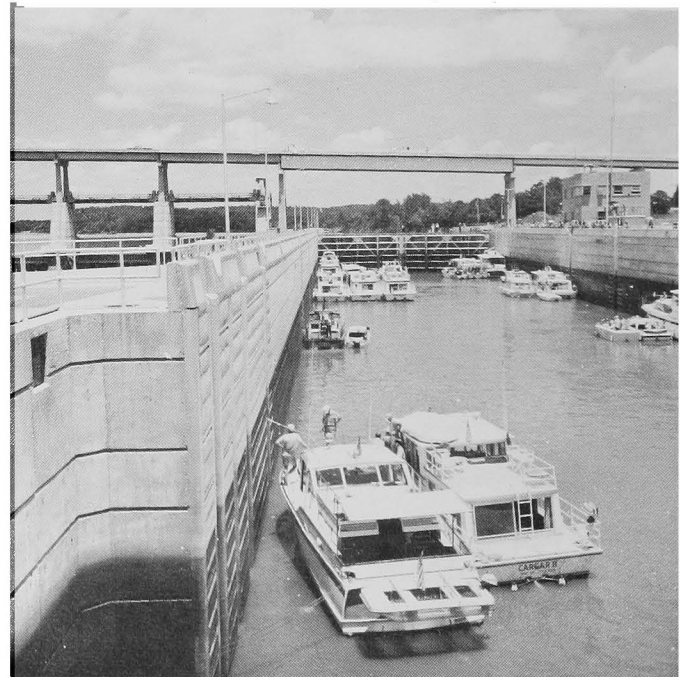
On December 31, 1968, Colonel Steel, accompanied by 17 river supporters and newsmen from Little Rock, North Little Rock, and Pine Bluff, made an inspection tour of the channel. The inspection revealed that the navigation facilities were ready, and that the Coast Guard was installing the final navigation aids. Colonel Steel officially announced the channel as open to navigation. However, since the river was high and turbulent, he cautioned against any undue haste in trying to lock through with larger tows. A small tow belonging to the Eugene Luhr Construction Company had been locked through Locks 1 and 2 as early as March 23, 1968. The tow had consisted of a small work-



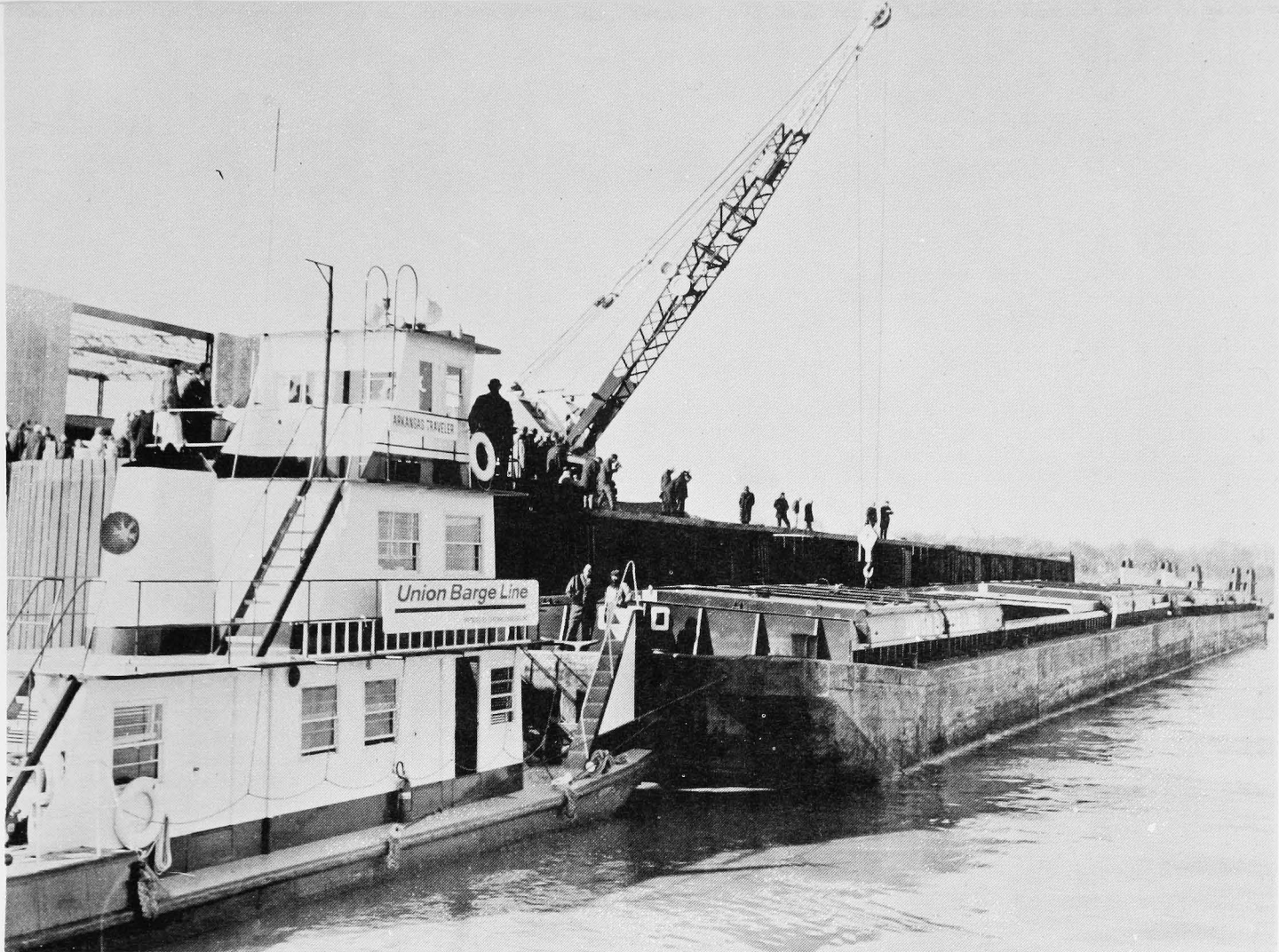
Fourche Creek floods at Little Rock in January 1969. City and county officials called upon the District for assistance.



The First shipment of butyl rubber passes through Murray Lock & Dam near Little Rock on the Arkansas River in April 1971.



Pleasure boats lock through Toad Suck Ferry Lock & Dam near Conway, Arkansas on the Arkansas River, June 1971.



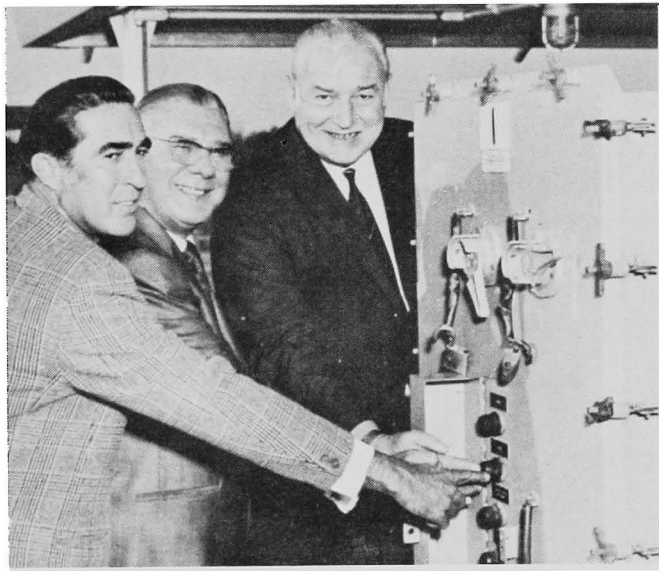
First Barges arrive at Little Rock Port January 4, 1969 with steel from Wheeling, West Virginia and Pittsburgh, Pennsylvania.



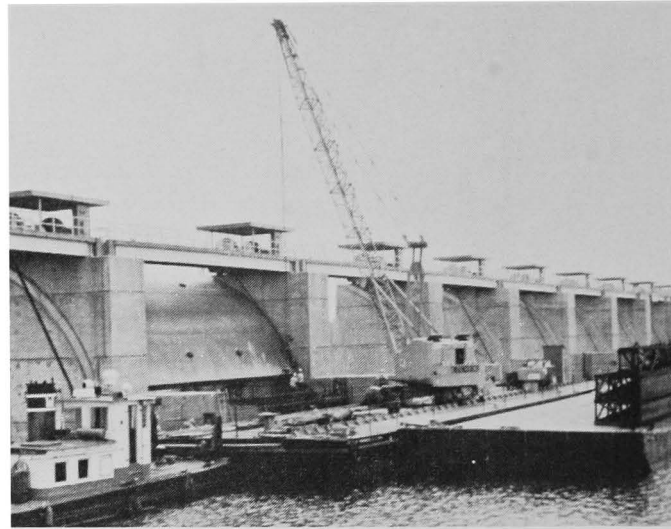
Six-Barge tow in Murray Lock & Dam December 1970.

boat, *Mike* and two barges loaded with miscellaneous items of construction equipment. An excursion boat, a small sternwheeler, the *Border Star* out of Kansas City, paddled into the newly reopened port city of Little Rock. Even considering its relatively small dimensions, 105 feet by 23 feet, it was unable to negotiate under the old bridge system during high water stages at Little Rock, pointing up the need for the completion of the new or altered bridges.

Several barge companies were hoping to be first to take their barges through Lock and Dam No. 1. On December 31, 1968, Union Barge Lines towboat *Arkansas Traveler* nosed two steel-laden barges into the lock, and proceeded upstream to David D. Terry Lock and Dam (No. 6) to tie up through the night of Friday, January 3rd. The intent was to arrive in Little Rock Saturday, January 4th, for welcoming ceremonies and the official opening of the port, the first commercial traffic on the Arkansas River since the opening of that segment. The *Arkansas Traveler* was manned by two east Arkansas brothers, Lloyd Murphy and Ken Murphy. The tow was accompanied during most of the channel journey by a new Corps of Engineers river patrol boat, the *Dumas*.



State Senator Carl Sorrells, Congressman Wilbur D. Mills and Governor Winthrop Rockefeller participate in pool raising ceremonies November 25, 1969 at Lock & Dam No. 9 on the Arkansas River near Morrilton, Arkansas. Similar ceremonies were held at the locks and dams between Little Rock and Fort Smith. Each participant received a "Button Pusher" certificate.



Work boat fleet at Lock & Dam No. 3 August 1969.

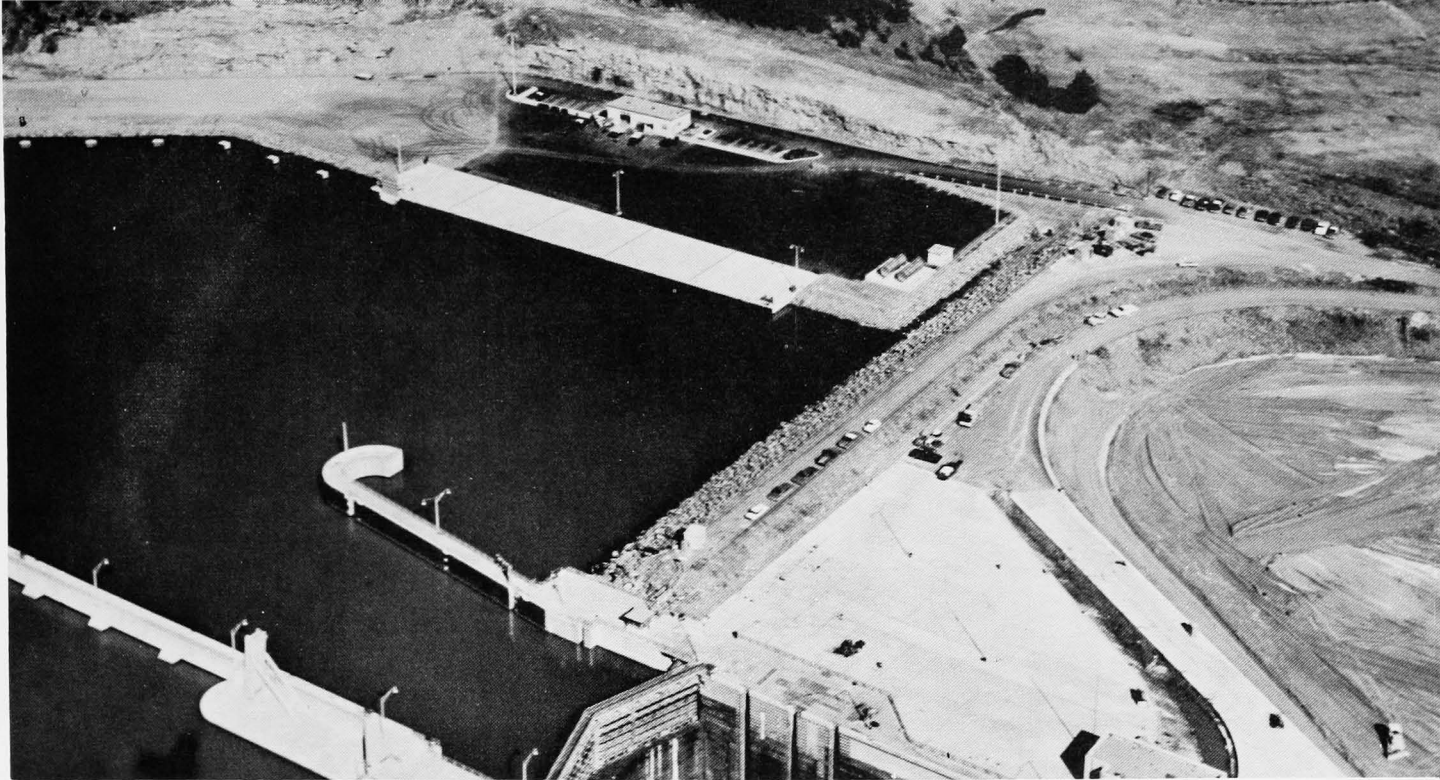
Lloyd Holbeck, in an article on the Arkansas River project, noted that the year 1969 might well be called "The Year of the Arkansas River" if Chinese descriptive terms were assigned to years. Certainly that year saw the ripening of the first fruits of this project. While river traffic was slower than anticipated in the first few months, the volume and the tempo accelerated rapidly.

During 1969 work was completed on the six locks between Little Rock and Fort Smith and navigation was declared open to the Arkansas-Oklahoma State line December 29, 1969.

By March of 1970, Jerol Garrison of the *Arkansas Gazette* reported the Arkansas River was already a "major vehicle for international trade." Hundreds of thousands of tons of material, including bauxite, soybeans, grain, chemicals, steel, lumber, rock, salt, pipe and paper began moving on the Arkansas River. Colonel Steel retired in July from the Army, remaining in Little Rock and was succeeded by Colonel William C. Burns. By the end of 1970, navigation had been declared open to the upstream end of the project at the Port of Catoosa, near Tulsa, Oklahoma.

On January 5, 1971, President Nixon signed the Act renaming the \$1.2 billion project as the McClellan-Kerr Arkansas River Navigation System, honoring two U. S. Senators, John L. McClellan Arkansas and deceased Robert S. Kerr of Oklahoma. Several locks and dams were renamed by the same Act, honoring other historic boosters of the river project.

As Senator McClellan said at the official ceremonies opening the Arkansas River: "This is truly the American valley of the future — it is today the valley of promise, of progress and prosperity."



Dardanelle Marine Terminal and resident office visible above upper lock mitre gates.



Commercial boat docks on the Arkansas River expanded rapidly to meet demands of pleasure boaters who wanted to use the new waterway. (Twin Rivers Marina upstream from Murray Lock & Dam and Little Rock.)

## Since Then

In 1971 the Arkansas River Navigation project was re-named to honor the two United States legislators who had been most instrumental in its creation, Senators John L. McClellan of Arkansas and the late Robert S. Kerr of Oklahoma. The legislation which created the McClellan-Kerr Arkansas River Navigation System also provided for recognizing some previous name changes of individual features, such as the David D. Terry Lock and Dam, but one new name-change authorization caught the fancy of the American public. Lock and Dam No. 8 was to take the name Toad Suck Ferry Lock and Dam.

The name "Toad Suck" was one well-rooted in Arkansas Faulkner and Perry County history. As early as 1823 there had been a ferry crossing near the present site of the Corps structure, and near that crossing was a rustic tavern where the weary travelers could quench their inevitable thirst. Called the Toadsuck Tavern, local legend accounted for the name as deriving from the drinking habits of the patrons. The oft-told story is that the wayfarer would "suck in so much liquor that they would swell up like toads." Whether or not that is the definitive history, the name was so curiously attractive that it stayed with the ferry crossing long after the collapse of the tavern. When the State took over the operation of the ferry in 1956 the name remained, but historians feared its demise with the completion of Lock and Dam No. 8, for that structure provided for a two-lane high-level roadway. As a segment of Arkansas State Highway 60, the new bridge was the natural conclusion to 133 years of ferry crossing, but determined local interest saved the name by attaching it to the new structure.

The fact that Lock and Dam No. 8 had been designed to accommodate a highway was a significant development in itself, for the original concept of the Lock and Dam had not included this feature. It was at the request of the Arkansas Highway Department that design and structural

changes were made for the accommodation, and the AHD had also assumed the additional cost of design and structure. At the same time similar commitments were made for Locks and Dams 3, 4, 9, and 13. Under the agreement



Toad Suck Ferry Lock and Dam, near Conway, Arkansas. A bridge was built over this dam in 1971, similar to the structure completed over Lock and Dam 13 in 1978.

both State funds and Bureau of Public Roads funds were used to construct the bridge and bridge approaches.

The Toad Suck bridge and temporary approaches were completed in 1970. Formal dedication took place on Sunday, September 27, with the Honorable Wilbur D. Mills, Congressman, Second District, as the principal speaker. To further insure the safety of the name "Toad Suck" there would be a formal dedication of a historical marker at the site of the traditional landing. Lt. Gov. Bob Riley on that occasion commended the efforts of the Faulkner County

Historical Society, and assured the assemblage that with the name "Toad Suck" so "firmly implanted" it would be possible for the adults to communicate to the young the rich history and traditions of the area.

In 1976 funds were received from the Federal Highway Administration to award a contract for a bridge superstructure on Dam No. 13. This span, to link Highway 22 east of Barling with Highway 64 east of Van Buren, was the second such structure to be completed under the cooperative arrangement. The bridge was accepted in 1978.

## Dedication of the McClellan-Kerr Navigation Project

The target date by which the McClellan-Kerr Navigation Project was to reach its goal, Tulsa, had been established as December 31, 1970. As that date approached, interest in a dedication of national significance began to mount all along the waterway in general, and in the Tulsa area in particular. The Tulsa Chamber of Commerce, recognizing the preeminent position of that city as the head of Navigation, marshalled the support of various

local and regional organizations to assure that the dedication would be memorable. On a statewide level, the Governor of Oklahoma appointed an "Admiral's Committee" to attend to the overall planning, with Tulsa District Engineer Colonel V. W. Pinkey actively participating in the planning sessions.

From the earliest planning stages it was anticipated that President Nixon would attend the dedication, and with



President Richard M. Nixon dedicates the McClellan-Kerr Navigation Project June 5, 1971.

his assent a suitable date was planned around his schedule.

As plans and dates were being formalized the Admiral's Committee attended to the matter of commemorative coins and the Presidential medallion, all to be affixed to a suitably impressive dedication plaque. Publicity information was distributed to the area media, facilities were constructed, secret service instructions were followed, and the dedication date of June 5, 1971, arrived without incident.

At the ceremony President Nixon addressed a congenial crowd of approximately 30,000, noting that the completion

of such a major project represented the triumph of bold vision over the skepticism of those with less imagination. "By undertaking a vast project that some called impossible and others called worthless and making it a success, you have demonstrated once again the vitality of the American tradition of daring great things and achieving what we dare."

On the plaque which was unveiled at the ceremony were the simple yet powerful statements, "Conceived in Dust, Cradled in Flood, Created by Men."

## Fee Program and Contract-Staffing

One of the persistent problems facing the Corps has been the effort to maintain recreational areas in the face of mounting costs and public resistance to use-fees. The earlier experiments were considered unsuccessful because of haphazard collecting and ill-defined advantages. Public Law 93-81 (1973), attempted to define the advantages by tethering fee collection to a comprehensive package of facilities and services, including flush restrooms and showers. The effect of this law was to eliminate all but a few of the sites, and make collections more difficult.

In 1974 Public Law 93-303 relaxed some of the more stringent requirements of camp sites, thus qualifying the majority of the parks within the Little Rock District. Problems of fee collection, professional staffing, public relations and vandalism persisted, however, until an experimental, innovative program was tried and proved. The idea was the brainchild of Richard B. Groves, resident engineer for Table Rock Lake. From his own camping experience Groves knew that the most conscientious campers seemed to be the retired couples who came in their Recreational Vehicles (RV's), and these same people were normally considered out of the job market. Why not,

reasoned Groves, try to use this talent on a seasonal live-in basis? Offered a free trailer site and utilities, plus a monthly salary to be decided on a bid-basis, Groves correctly assumed that many retired couples would be eager for the opportunity to camp free while earning a supplemental income. Groves submitted his suggestion to the District, and was awarded the title "Suggester of the Year," a cash award, and a Presidential note of appreciation.

The plan, instituted on an experimental basis in 1974, proved to be an unqualified success. Aside from collecting fees, the contract couple provide many services, depending on their particular agreement, but their on-site presence alone helped to bring about a dramatic reduction in vandalism and abuse. With the improvements, campers were no longer reluctant to pay the \$2 to \$3 fee for the specified areas, and about 45 parks in the District were still available free of charge. The immediate success of the idea has led to national acceptance in the Corps system, and even to adoption by some private campgrounds. It seems that the "Ma and Pa" system, as one writer called it,<sup>1</sup> evokes a spirit of "us" among the campers, as compared to the "you-or-me" of the previous arrangement.

## Disasters and Assistance

The Spring of 1973 seemed to be particularly violent, with frequent tornado sightings and unusually high winds throughout the season. Fortunately many of the tornados never touched down, or if they did it was away from settled communities. The exception had to come, and come it did on May 11, at Harrison, Arkansas. On that date winds rocketing along at 73-miles-per-hour blew across the Eagle Heights area causing such damage that many residents thought they were being caught up in a tornado. Despite the damage the community escaped without fatalities.

The Little Rock District responded "almost immediately," according to the mayor of Harrison, and that little city was soon crawling with men and equipment brought in from Bull Shoals, Norfolk, Table Rock, and Little Rock. Mayor Hugh Ashley thanked the Corps profusely on be-

half of the community, noting that the three days of work by the Corps amounted to greater accomplishment than the city crews could have achieved in six months.<sup>2</sup>

In mid-afternoon of March 23, 1976, the little town of Cabot, Arkansas, was much less fortunate. Cabot was devastated by a tornado which seemed to rip through every structure in the community. In snaking a 10-mile path across the county and through Cabot the tornado did more than \$7.7 million in damage, according to Mayor Willie Ray. The twister, described by some as twin tornados, took five lives, injured dozens of others, shattered downtown Cabot, and destroyed more than 300 dwellings. One State Police lieutenant, watching the cleanup operation, observed that the debris removal amounted to nothing less than "moving Cabot to the dump."<sup>3</sup>

The Corps responded to the crisis, both in providing

1. Pat Hutchings, "Contracting with the Corps—for Cash and a Campsite," *Trailer Life*, January 1975.

2. J.E.D., "On the Inside," *Harrison Daily Times*, May 14, 1973.

3. *Arkansas Gazette*, March 31, 1976.



District employees provided assistance in the aftermath of the tornados that struck Harrison in 1973 (top) and Cabot in 1976. (Left)

immediate support, and then in supervising the removal of debris. Colonel C. E. Edgar, III, District Engineer, appointed Bill Moore as the engineer-in-charge for the project, bids were received from construction companies, contracts were let and the clean-up process was underway even as survivors planned for the future.

One noteworthy development coming out of District efforts in the cleanup was the announcement that two of the supervisors would be women. Carolyn K. McDaniel and

Carolyn C. Jones were somewhat apprehensive about the assignment, but found that there was no "hassle." Both would be highly praised by Bill Moore, and deeply appreciated by the local citizens.

Within three weeks the engineers had contractors haul away about 200 truckloads of debris, or about 7,500 cubic yards of wreckage and rubble. The people of Cabot were already planning for a brighter tomorrow.

## Floods

Following a comparatively wet fall and early winter, the rains began in earnest in January of 1973. The rains continued with increasing intensity and duration throughout February, with no forecast of relief. The District began to prepare itself for a flood fight.

Flooding in the Little Rock District would be caused by two conditions: backwater flooding in the Mississippi basin, and runoff overflow from the upper Arkansas and White River drainage basins. Little could be done about backwater flooding, except to maintain levees, but the White River runoff condition could be controlled within limits by the storage capabilities of the reservoir system. By withholding water in periods of maximum runoff, and gradually releasing that water during slack spells, the District was able to cut flood damages significantly.

The crests on both the Arkansas and the White River would come in late April. The high flow would bring Arkansas traffic to a halt, as Locks 3, 4, 5, David D. Terry, Murray, Toad Suck Ferry, and 9 had to be closed to navigation at one time. It was almost exactly a month before the River could again be reopened to traffic, and it was still another month before the River returned to its banks. At Little Rock and North Little Rock local flooding was experienced in low areas, and sandbags and pumps were furnished to officials of North Little Rock.

The White River flood control system was able to manage flood runoff to a large extent because of its capacity to store excess water. At the upper end of the system Beaver went over the spillway for the first time since it was completed in 1965, but the other reservoirs were able to contain the surplus without complications. As the White River crested, sandbags were used to prevent failure of the Jackson County Levee District levee between Newport and Jacksonport. The District Flood Emergency Center was activated on a limited basis on April 21, and on a round-the-clock basis on April 23 as the crest began to pass.

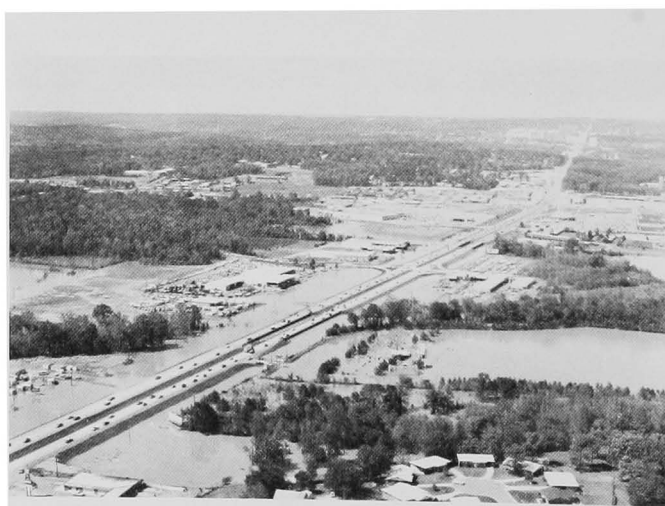
Blue Mountain Lake and Nimrod Lake reached the top of their flood control pools by the time that the runoff slackened, with the reading at Blue Mountain (419 mean sea level) being the second highest on record.

The Arkansas River flood crest at Little Rock was successfully minimized by the reservoir system in the Tulsa District. The crest was only 3.2 feet above flood

stage despite the fact that the flow was 375,000 cfs, as compared to the average flow of 40,000 cfs. Even better statistics were revealed in the facts that the system had prevented flood losses of \$8.4 million in the Arkansas River Basin, while the White River system had prevented losses of some \$16.7 million.

The flood did effect work that was in progress, as the District had to commit much of its resources to the flood emergency, and even more significant resources had to be committed to post-flood recovery operations. The post-flood operations included damage surveys and debris clearance, rebuilding of park facilities, repair of damaged flood protective works, repair of channel improvement structures, and restoration of navigation on the Arkansas River.

Activities which were affected by the flood included work at the Ozark Powerhouse, where a problem had developed in setting the downstream draft tube gates. It was discovered that it was impossible to set those tube gates as long as the river flow exceeded 50,000 cfs. Navigation too was affected by more than the temporary expedient of being halted; the high flows had brought with it major shoaling, and damage to bank stabilization struc-



1973 flooding in Little Rock.

ture. Fortunately for navigation, the removal of the old Main Street bridge at Little Rock (in the interests of improved navigation), progressed despite the high river stages, and the new bridge work remained on schedule. Both the new Main Street bridge and the Highway 64 bridge at Fort Smith were completed in June of 1973.

Since the matter of navigation was uppermost in the minds of the shippers, several representatives of the towing industry met with the Arkansas Waterways Commission and the Little Rock District staff to discuss immediate problems. Among those serious problems, other than shoaling, was that of determining where the channel thalweg (the deepest part of the flow line) might have shifted. The District coordinated with the Coast Guard in developing detailed plans to insure an accurate survey, and adequate dredging capability after channel identification. Bids were opened for two maintenance dredging contracts on April 24th. Two additional dredges were sought to alleviate the serious shoaling problems downstream from all locks and in the upper end of the Arkansas Post Canal. The River system was in good condition within a short time, and most of the camping and recreational facilities along the White River system were ready in time for the season.

As often happens, a flood year will follow a flood year, and 1974 proved the point. The 1974 high-water problems were actually two different problems at two different times; Spring flooding caused by cloudbursts falling directly on the affected area, and Fall high-water resulting from heavy rainfall in the upper Arkansas drainage basin.

On June 7 farmers along the Black and White Rivers in Arkansas and southern Missouri were warned that they might experience additional delays in their spring planting, due to "present and expected" heavy rainfall. The District Engineer had issued the warning because of the heavy rains which had already saturated the soils and diminished the flood-storing capacity of the reservoirs. The Corps was trying to minimize the water release in order to hold river stages low enough for farmers to tend their crops, and in order to do that only minimum amounts of water had been released from Norfolk and Bull Shoals dams. Thus the flood pools were already above normal, with some 1.3 million acre-feet of flood waters impounded. Normally this stored water could be released slowly during the dry summer season, but 1974 would have no dry summer season.

Starting on the morning of June 8 the rains came with biblical ominousness. The storm struck southeast Little Rock at about 10:30, and while it lasted only 20 minutes the intensity was remarkable. 60-miles-per-hour winds, accompanied by heavy rains, felled large trees, ripped an airplane from its "secure mooring," tore down utility lines, wrecked cars, and inundated lowlying areas. From this traumatic beginning Arkansas went on to have one of the worst months of its historical existence. In only 18 days



Despite high lake levels at White River Basin lakes in 1974, picnickers made use of park facilities that were not completely inundated.

Little Rock had double its normal June rainfall, and record low temperatures were set on June 24, 25, 28, and 29.

In the reservoirs of the White River system the June rains raised the flood pools to higher readings, much to the consternation of boatdock owners. In the Arkansas River reservoir system, within the Tulsa District, those flood pools were also filled and the excess had to be released to continue down the Arkansas. The Little Rock District Engineer, Colonel Donald G. Weinert, could only issue warnings to the farmers along the Arkansas River, and to the people engaged in river commerce.

At Little Rock the river flow jumped to 70,000 cfs on Friday (Nov. 9), 150,000 cfs on Monday, and to a high of 204,000 cfs on Thursday, Nov. 15. At Ft. Smith the River crested at 28 ft., but its flow was nearly four times the normal rate and thus barge travel was adversely affected. Fortunately the rains in the upper basin were letting up, and by mid-November the Tulsa District reservoirs were able to control the runoff. By December 12, at Little Rock, the flow was down to a near-normal 50,000 cfs.

## Visit of Chinese Engineers

One of the more interesting announcements coming out of the District was that of an impending visit by a delegation from the People's Republic of China. The visit, a direct outgrowth of the President's historic visit to China, was arranged by Dr. Henry Kissinger at the request of the Chinese leaders. Their tour into the Little Rock District was a segment of a larger 7-week tour of various installations of unique hydro-technical interest.

The Chinese study delegation of ten members was escorted by State Department security personnel. There was little forewarning of the visit, as the delegation expressed the wish that no itinerary be published and that their stops not be given prior publicity. The delegation also requested that social activities be kept to a minimum, but protocol demanded certain amenities. Upon their arrival (May 10, 1973) they were taken immediately to the capitol, where they received an official welcome from Gov. Dale Bumpers, represented by Lt. Gov. Bob Riley. That night they were feted at a dinner and reception, which was kept relatively informal at their request.

On the next day the delegation was all business, visiting Ozark Lock and Dam. They were intently interested in all aspects of the operation, from the lock mechanism to the floodgates, to the inclined turbines. On Saturday they toured the Dardanelle Lock, Dam, and Powerhouse, then returned to Little Rock for briefing on sedimentation control.

Sunday was a day of relaxation, as the group visited Greers Ferry Dam and enjoyed a picnic in the Corps park area. On the next day, May 14, after evincing sincere

goodwill and appreciation, the delegation departed for Phoenix, their next stop. The visit was adjudged to be a great success in every respect.



The delegation of Chinese visitors tour the Ozark Lock and Dam Control Room, led by Jesse W. Story, Ft. Smith Project Engineer (center).

## The Bicentennial

In the early period of our nation the national birthday was celebrated with elaborate displays of useful skills. In that respect the Little Rock District was already prepared to celebrate the Bicentennial even before a special program was devised, for nothing could better demonstrate national vitality than the immense projects which had been brought into being by the District. Perhaps it was this pride in accomplishment which made it imperative to excel in celebration of the Bicentennial.

In consultation it was decided that the major thrust of the District activities would be in the dedication of a time capsule, and in the preservation of the historic site of the Cadron Settlement.

The time capsule idea captured the imagination of everyone, and offers of support poured in from throughout the State. Spurring even greater interest was the notification that the Time Capsule Project had been recognized as an Army Bicentennial Installation—the first Corps

Bicentennial activity to be so recognized. As an adjunct to this recognition the Project was registered by the National Headquarters for Bicentennial Activities, bringing national attention to the undertaking.

The capsule would be constructed of heavy stainless steel, with dimensions of 12" x 12" x 31". When sealed, the capsule contained over 19,000 microfilmed pages of material, as well as selected artifacts. The types of microfilmed material included messages and drawings from Arkansas school children, charters of the Boy Scout Councils in Arkansas, letters from Arkansas municipal, county and state officials, and even notes from inmates at Cummins state penitentiary. Material specifically relating to Corps activities in Arkansas included histories, documents, charts and photos, as well as artifacts.

The permanent home of the capsule was to be the Murray Lock and Dam Visitor's Center, but since it was not yet completed the capsule was temporarily located



The District's Cadron Settlement Park maintains a backwoods atmosphere, located at the historic Cadron Settlement site in Faulkner County. The park was dedicated in 1976.



Stops like these along the Arkansas River allowed visitors to go aboard the "Sgt. Floyd," a towboat transformed into a museum for the Bicentennial.

near the lock and dam, sealed in a 7,000 pound pyramid-shaped concrete enclosure. At formal dedication ceremonies, held on June 14, 1975, Arkansas State Historian Dr. John Ferguson was the principal speaker, expounding on the theme of time and change.

Two years later, with the completion of the Visitor Center, the capsule was relocated to its permanent housing, not to be opened until the year of the Tricentennial celebration. The dedication of Murray Park (June 15, 1976) was recognized as part of the Bicentennial activities, and

was a major focus of community activity. Among the individuals and agencies who had worked with the District to bring about this event, credit should be given to Dr. Fred Williams of UALR, the Little Rock Parks Department, and the Little Rock Junior League. At the ceremony Colonel Charles E. Edgar III, officially handed over to Mayor George Wimberly a lease authorizing the city of Little Rock the right to use, operate, and maintain Murray Park, as of that moment. After the dedication program the crowd was entertained by music and art

presentations, and by a water show.

A second District Bicentennial activity, a park located at the historic Cadron Settlement site in Faulkner County, near Conway, was the suggestion of the Faulkner County Historical Society. Utilizing a rustic theme throughout, in keeping with the historic setting, the completed park was called "another gem" by a local writer.<sup>4</sup> The Cadron Set-

tlement Park was dedicated in May of 1976, with Lt. Gov. Joe Purcell as the featured speaker.

During the Bicentennial year the District also arranged for a visit of the "Sgt. Floyd," an old towboat which had been transformed by the engineers into a floating museum. The "Sgt. Floyd" was incorporated into many county Bicentennial celebrations along the River.

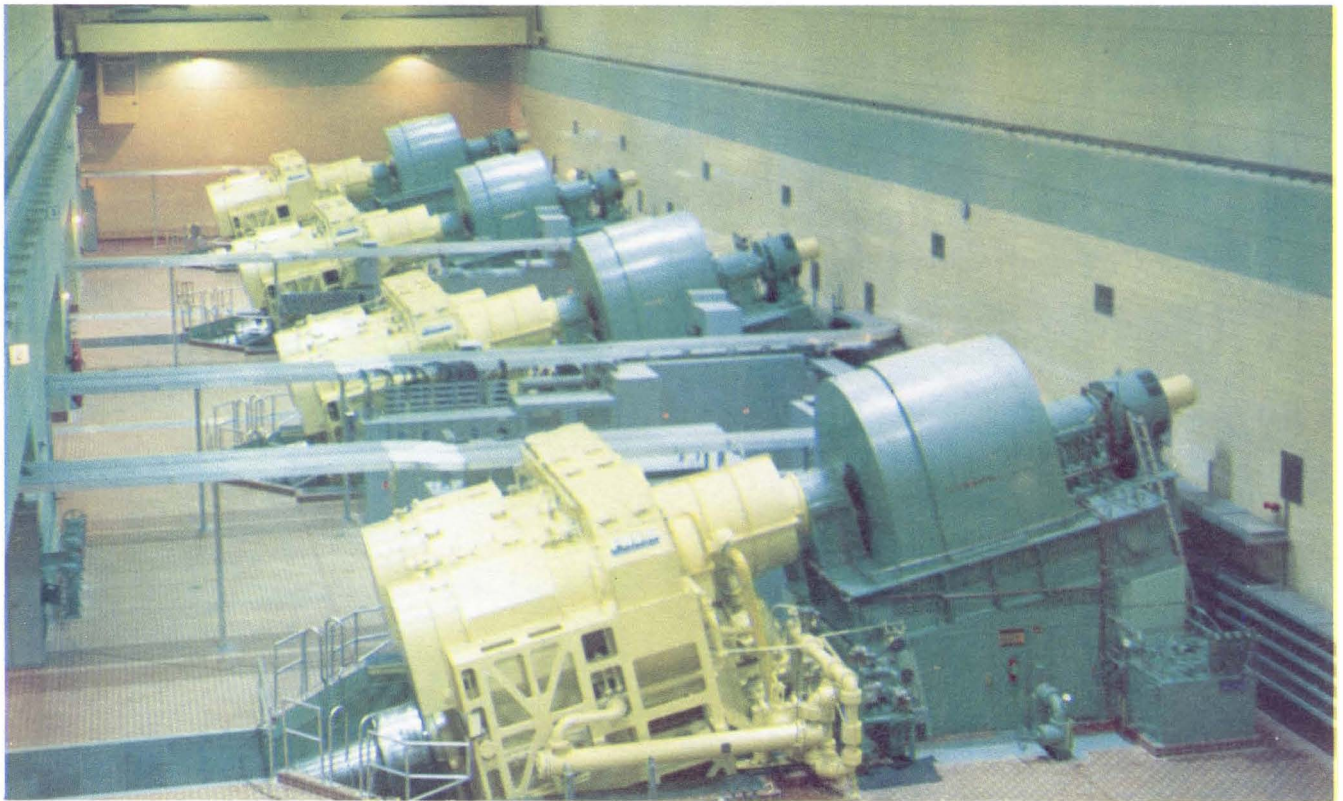
### Inclined-Axis Generators

One of the more technically interesting developments within the District in recent years was the installation of inclined-axis generators at Ozark Lock and Dam Powerplant. The concept essentially involves tilting a power generator to a 12° angle above the horizontal, as a means of developing hydroelectric energy from a low-head pool. Design and layout problems were immense, but not insurmountable, and the extra expenditures were somewhat compensated for in the fact that there was a considerable savings over conventional excavation.

After overcoming such problems as cracked shafts,

faulty couplers and broken bolts, Unit No. 1 was put into operation on November 17, 1972, followed by Units 2, 3, and 4 in 1973. The last Unit, No. 5, was placed into commercial operation on May 3, 1974.

By April of 1977 total generation had reached the 1,161,945,000 kilowatt level, or the equivalent of energy which could be generated by 1,191,305 barrels of oil. In fuel alone this represents a savings of \$8,517,834 to electricity consumers. The Ozark Powerplant has to be considered a solid engineering achievement, especially when considered alongside the national energy crisis.



Inclined-axis generating units at Ozark Lock and Dam Powerplant near Ozark, Arkansas.

4. Log Cabin Democrat, May 17, 1976.

## District Employees Honored

In 1975 the Department of the Army established the Gallery of Distinguished Civilian Employees, as a way to honor those who had contributed so much. The Little Rock District was eager to participate in the program, and was one of the first of the Districts to initiate the nominating process. A committee of senior employees was created to sift through suggestions, and they chose eleven long-time retired or deceased employees to be honored with the highest award, that of Distinguished Civilian

Employee. In subsequent years there have been four additions, bringing the total to 15 so honored.<sup>5</sup> Pictures of the Gallery recipients are prominently displayed in the District headquarters.

An additional recognition was given to one of the original recipients, Robert L. "Shorty" Baird, when in 1977 the District christened its newest towboat the *M/V Shorty Baird*, a fitting tribute for a man known to his contemporaries as "Mr. Arkansas River."



The Shorty Baird pushes a work barge on the Arkansas River.

5. See Appendix B for a listing of Gallery Employees.

## Visitor Center Receives Award

In October of 1976 the District held an Open House to honor the award-winning structure design at Table Rock Lake Resident Office and Visitor Center. Carrying throughout the theme of "Man and Nature in the Ozarks," the recently completed Center received the Corps' 1977 Distinguished Design Award, a presentation made on the basis

of selection by a panel of professional architects. The Center complex includes an auditorium, exhibit area, 4-seasonal aspect display, and nature trail, and is placed in a setting of natural beauty along the shore of Table Rock Lake.

## The Year of the Drouth

During the summer of 1976 Bull Shoals Lake dock operators were complaining about excessive water. By early winter all the concessionaires were complaining, only this time it was about the lakes being too low. Greers Ferry was 17 feet below normal, Beaver Lake was down 21 feet, Norfolk Lake was down 19 feet, and Bull Shoals was down 11 feet. The worst was yet to come.

The situation created a confrontation of classic proportions and basic priorities; the dock operators demanded that the Corps reduce drawdown in order that the water levels not be further lowered; the Corps could only reply

that recreation was a corollary of the reservoirs, not a reason for their existence, while the production of hydroelectric energy was one of the justifications for the project. However true, it was a difficult argument to accept, for recreation had become a major economic factor in the communities surrounding the reservoirs.

The petitioners were basing their hopes on the fact that Congress had directed that a study be made to examine the feasibility of including tourism and fish and wildlife aspects in managing lakes. That study, however, was far from completed and thus could have no bearing on the situation. Colonel Edgar did suggest to a meeting of interested citizens that they might further their cause by a presentation of factual evidence, but until the priorities were changed nothing could be done about power drawdown.

The marketing agency for the hydroelectric power, Southwestern Power Administration (SPA), was asked to alleviate the problem by drawing energy from elsewhere, but could not comply since other nearby regions were having similar drouth conditions. Only in one instance did the drawdown for power cease, when the water level of Norfolk Lake dropped so low that it created a water supply emergency for the city of Mountain Home. In order to compensate the SPA for its loss of power, President Carter signed an appropriation that allocated an additional \$6.4 million to that agency to buy power from other sources.

The situation worsened as the drouth continued through the remainder of 1976, then extended into early 1977. Since the early part of the year is usually a time for storing excess water, the continuing drouth seemed particularly ominous. Van Buren and Cleburne Counties were designated as disaster areas, and by February Representative John Paul Hammerschmidt was asking that the Counties of Boone, Baxter, Benton, Carroll and Marion be added to the list. Public pressure continued to mount against further power drawdowns as recreation seemed to be bearing a heavy burden.

February proved to be the valley month of the dry spell, for in late February and early March intermittent rains began to occur in the White River basin. While the rains were light they were at least adequate to hold existing water levels, and to begin rebuilding impoundments. As



Members of the public take part in the Annual Greers Ferry Lake Cleanup.

early as April 1977 most lake levels in the Basin were near their conservation pool elevations, but it would be a long time before flood pool elevations would be reached.

The question of Lake management and extended priorities is still under study and on schedule and expected to be finished in 1982.

If there was one group willing to see a temporary return of the drouth it was the Greers Ferry Lake Association. Just as they were organizing their Eighth Annual Cleanup, in co-sponsorship with the Corps of Engineers,

### The New Mattie

About the only positive aspect of the prolonged drouth was the October 1976 rediscovery of the wreck of the *New Mattie*, a paddlewheel steamboat which had been lost after springing a leak on February 17, 1900. The cargo had been salvaged shortly afterwards, but the rotting remains of the hulk had been forgotten until the receding waters of the White uncovered the historic relic. The find excited engineers, archeologists, and the news media, and a hasty examination was conducted before the wreck would be

reclaimed by the river, perhaps forever. A capstan (winch-type device) was removed to become part of a mobile, historic exhibit, but the bulk of the investigation consisted of surveying, measuring and photographing the remains. After one more brief appearance, in June of 1977, the *New Mattie* is again reposing in its watery grave as before, but perhaps not so thoroughly forgotten.

### Annual Inspection Tour of 1977

The Annual Inspection Tour of 1977 afforded an excellent opportunity to examine the river as affected by the prolonged drouth conditions of 1976-1977. Because the situation had been severe in Arkansas, there were many groups and agencies anxious to be on board the inspection vessel, the *Arkansas Explorer*. As always, the inspection was also conducted as a floating forum for a meeting of engineers, politicians, and concerned groups. For 1977 Congressmen John Paul Hammerschmidt and Jim Guy Tucker would be aboard, just as Senator McClellan, the "daddy of the whole thing," had been aboard for the 1976 tour. Among the other guests for limited segments would be mayors, members of Chambers of Commerce, representatives of waterways commissions, representatives of the Arkansas Game and Fish Commission, State Conservationists, power officials, levee boards, and port authorities, all in a tightly regimented schedule and all paying their own way.

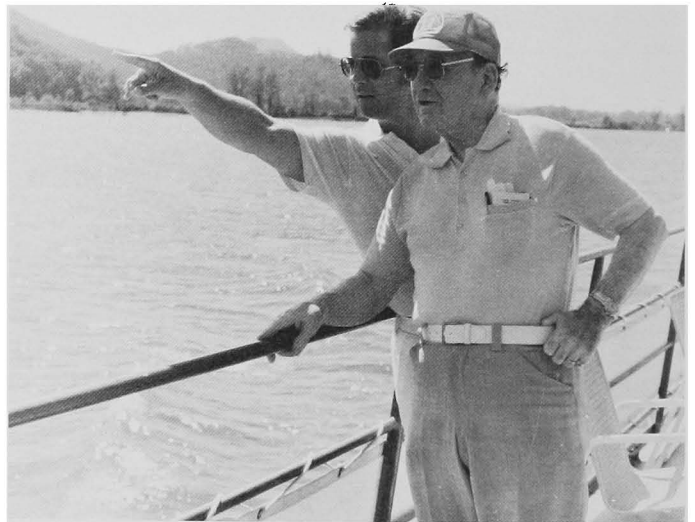
While the tour was rather routine work for the engineers and technicians, it was an impressive experience for the civilians and media who were fortunate enough to be part of it. No other presentation can so demonstrate the enormity, technological achievement, and success of the McClellan-Kerr Project as this journey through that portion included within the Little Rock District. All who participated emerged with a better appreciation not only for

the accomplishment, but for the need of the Project.

the accomplishment, but for the need of the Project.

the accomplishment, but for the need of the Project.

the accomplishment, but for the need of the Project.



Senator John L. McClellan, during the Annual Inspection Tour of 1976, with his administrative aide, Robert L. Snider.

### Deauthorization of Water Resources Projects

In 1977 Colonel Charles Edgar III, District Engineer, announced the deauthorization of two District projects; the Water Valley Dam on the Eleven Point River and the

Lone Rock Dam on the Buffalo River. The two projects, authorized 39 years ago, were among the 275 which Congress had automatically cancelled in early September, 1977.

## Opal L. James

In late June of 1977 the entire District was stunned to hear of the senseless murder of a Corps Park Ranger. Opal L. James and his partner, David Small, had been unfortunate enough to come upon two escapees from the Oklahoma State Penitentiary. Surprised in the act of an abduction, the convicts wounded Small and took James captive. James' body was recovered a few days later, but even though the killers were captured and sentenced to death, the District felt that James deserved more than vengeance. As the first and only Corps Ranger slain in the line of duty, the District wanted to honor James in a special way.

The suggestion was made and accepted that a Blue Mountain Lake visitor overlook be dedicated to James in official ceremony, and that his memory be further preserved through creation of the Opal L. James Memorial Scholarship at Arkansas Tech University. The scholarship, funded by voluntary contributions, is awarded annually to a student majoring in parks and recreation, or in wildlife management.

At the Visitor Overlook dedication ceremony, the family of James looked on with others as Colonel Dale K. Randels expressed the deep feelings of the Corps for Opal James and the ranger profession.

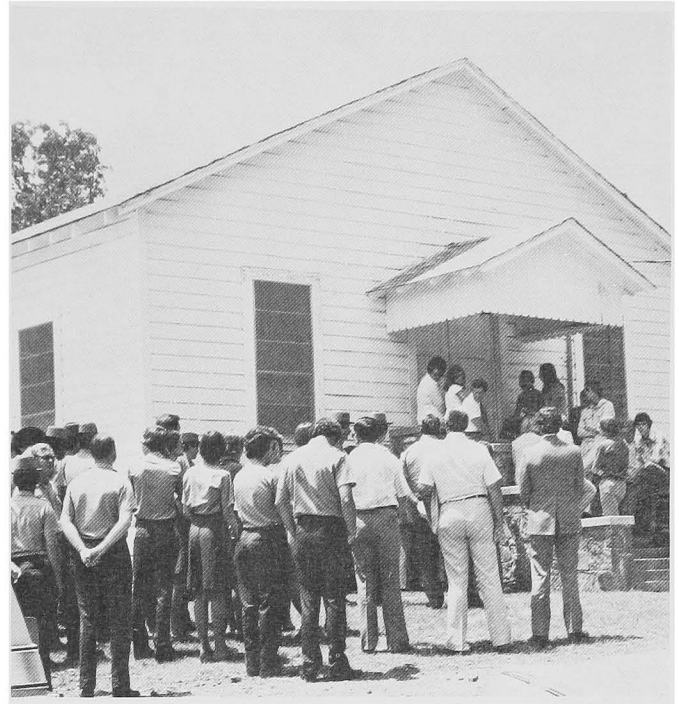
In order to better cope with crime in Corps parks, the District in 1978 began to contract with local law enforcement agencies to obtain increased patrol of park areas. Contracts were awarded to 21 Arkansas law enforcement agencies, the District agreeing to pay the salaries of extra deputies who would be hired for certain months of the year. The effects were immediate; rowdiness and vandalism were sharply curtailed to the peace and tranquility of campers and picnickers.

## Dam Inspection Program

In recent years two spectacular dam failures have created a national awareness of the threat facing so many Americans, and brought a concomitant demand that the Federal government undertake an inspection of non-Federal dams. Since these private dams are constructed at a rate of 25 to 1 over federal dams, they have created what one author called "a vast reservoir of danger."<sup>6</sup>

In 1977 President Carter signed an order authorizing the Corps of Engineers to begin a four-year program of inspecting some 9,000 non-federal dams. Described as "high hazard," the basic criteria calling for inspection was that the failure of the dam would result in substantial loss of life and property.

Throughout the nation the Corps of Engineers sprung into action. In the Little Rock District teams of Army



Park Rangers and other District personnel attended the Opal L. James funeral.

Engineers prepared to inspect some 1,094 dams in Arkansas, of which 69 were known to be in the high-hazard category. Many dams have already been inspected and the District is in the process of submitting its reports.

Federal inspection does not carry legal responsibility, however, for the owners remain legally responsible for any potential hazards created by their structures.

In order to further facilitate the inspections, the Little Rock District entered into negotiations with the State of Arkansas, whereby the State would conduct its own inspection program. The Corps would supervise the inspection and pay the State for the work.

All of this does not mean that there can be no more dam failures, but it does mean that there is considerably less likelihood of a surprise failure.

6. "The Search for Dangerous Dams," Gaylord Shaw, Smithsonian, April, 1978.



Unveiling of the memorial plaque dedicating the Blue Mountain Lake Visitors' Overlook to Opal L. James. From left to right: District Rangers Charles Shelton and David Small.

## The District Today

Since the opening of the McClellan-Kerr Arkansas River Navigation Project, the system has justified every expectation. The 2.9 million tons of river traffic in the first year (1969) was exceeded by 37.6 percent in the next year of operation, and river tonnage has climbed steadily every year since, with but two exceptions; a period when high-water conditions halted traffic for a month, and again during a brief interlude reflecting a nation-wide recession.

The efficiency of the system has been such that rail and truck industries have become more competitive in order to retain their share of the hauling industry, to the overall betterment of the economy of the region. River commerce continues to be innovative, with successful experiments including containerized cargos and use of extra-wide ocean-going barges, all to the advantage of transoceanic shippers. With this improvement in transportation cost and diversification, new businesses have located along the river, lured by the availability of bulk transportation, as well as other plus factors.

1977 did not begin like a year of destiny, but it ended up as one. The weather in January went on record as the fifth coldest in Little Rock history, and the river even crusted over lightly at Little Rock. Fortunately, the creation of a navigation system assured that the river would run too deep to freeze solid, as it had done in shallower days in 1918, thus commerce was not hampered. Traffic picked up steadily, so that by the end of 1977 the District was able to announce that commodity shipments for the year, 9.1 million tons, represented a 40 percent increase over tonnage moved on the Arkansas River for 1976, when a record 6.5 million tons had been recorded. The 9.1 million tons was another new record, and confirmed the steady growth of commercial barge traffic on the McClellan-Kerr System, then concluding only its seventh year of operation. Both inbound and outbound shipments had showed a 64 percent increase, and even internal shipments had recorded a gain of 18 percent.

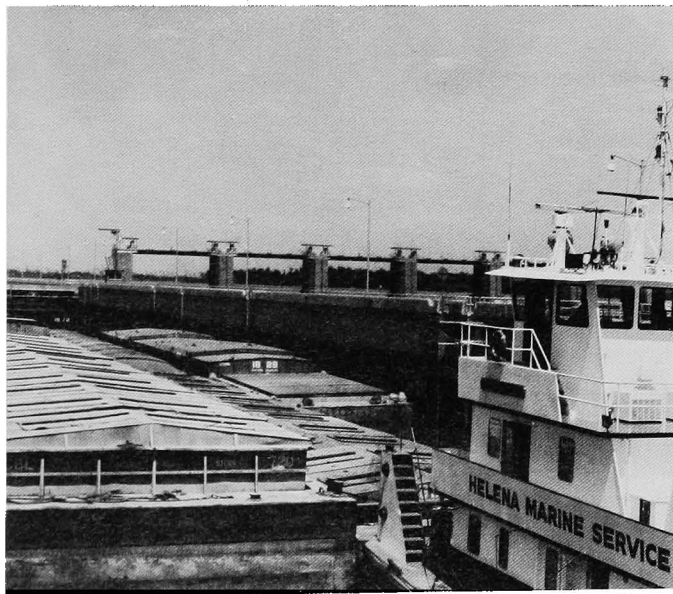
District success in areas other than navigation and commerce was equally noteworthy. The five White River hydroelectric plants had generated more than 815,000 megawatt hours, and the Dardanelle and Ozark powerhouses produced 920,000 megawatt hours during 1977. This combined energy would be enough to support a city of some 150,000 population.

The recreational aspects of the District must be accounted as an extraordinary side benefit. In 1977 the District recorded 9.3 million visitations at the District Parks along the McClellan-Kerr System, while the various features of the White River system attracted visitations of 22.4 million in the same year. The total of these visitations takes on even more significance when compared to the total estimated population of Arkansas, computed at approximately 2.2 million.

Within the first decade of operation on the River Navigation System, a landmark was established. In 1978, following continuing increases in tonnage transported on the River, the District could proudly acclaim in April that a new monthly record had been established with the locking through of the motor vessel *Miss Lily Peter* and its nine-barge tow. In that one month, by April 23, total tonnage had exceeded the *one million ton mark*. Colonel Edgar, a bevy of local officials and representatives of the media were on hand to witness the historic occasion, as the 5,613 tons of bauxite and steel were locked through Lock and Dam No. 4. Even the most optimistic backers of the navigation project had never anticipated the possibility in such a short time.

In June of 1978 Colonel Dale K. Randels assumed command of the District from Colonel Ernest Edgar. He noted the record-setting achievements of the District in 1977, and the pride of accomplishment shared by all District employees. As the early reports of 1978 began to come in, Colonel Randels confidently predicted that the year would be another time of record-breaking service to the State, both in recreation and in opportunities for industrial growth. Speaking to the press he foresaw the year 1978 would be "recorded as a year of significant accomplishments."

The future looks brighter than ever.

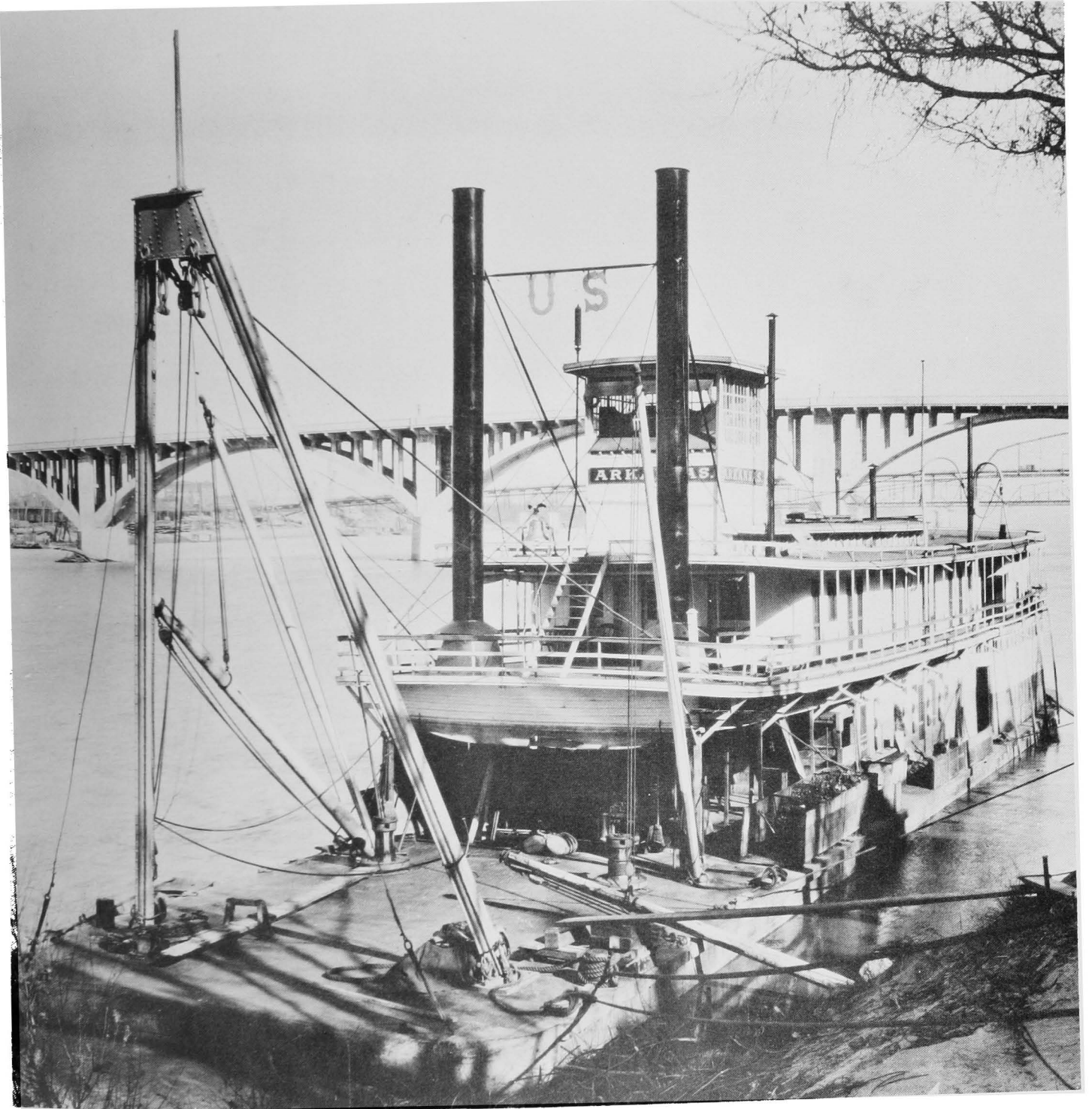


The *Miss Lily Peter*, with a nine-barge tow of bauxite and steel, upped the April monthly tonnage over the one million ton mark.

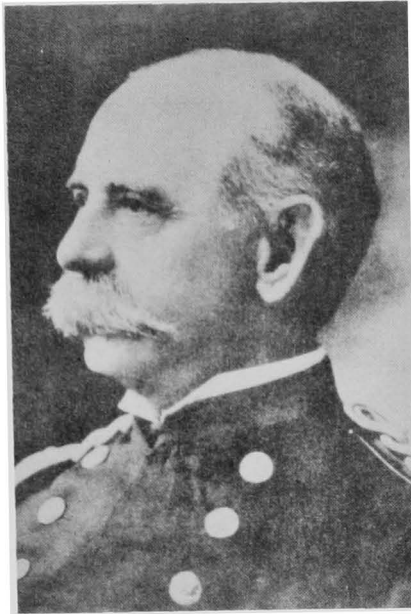


The Little Rock Port was established along the Arkansas River. Within the complex is the Foreign Trade Zone, the only facility of its kind on the navigation system.

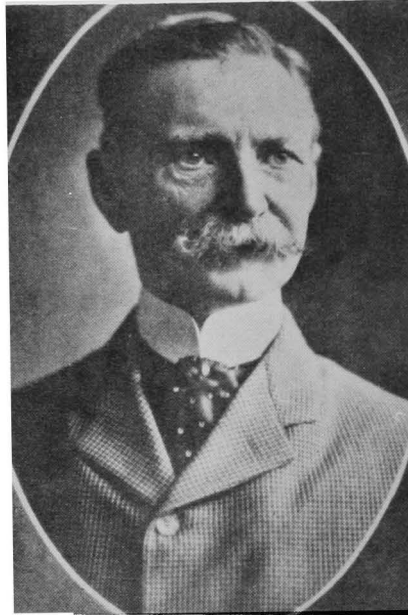
The Steel-hulled U. S. Engineer snag boat, "Arkansas" moors at Little Rock in 1920.



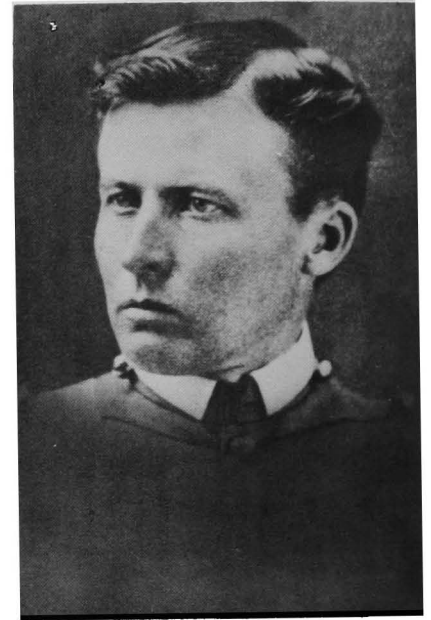
## District Engineers 1881-1893



**Captain Thomas H. Handbury**  
Feb. 1, 1881 — Dec. 11, 1883



**Major Milton B. Adams**  
Dec. 11, 1883 — July 3, 1884



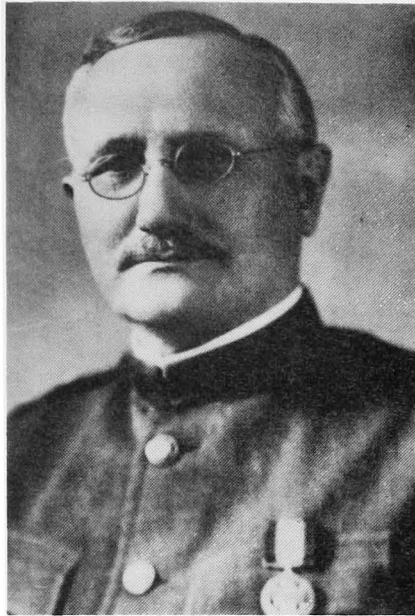
**Captain H. S. Taber**  
July 3, 1884 — Dec. 19, 1893

As the Arkansas and White Rivers increased in commercial importance, the Corps of Engineers established an Engineering office in Little Rock in 1881. Captain Thomas H. Handbury, as the first District Engineer, asked for a complete survey of the Arkansas River so that a program of permanent improvements could be formulated. That survey was completed to Wichita, Kansas by 1885.

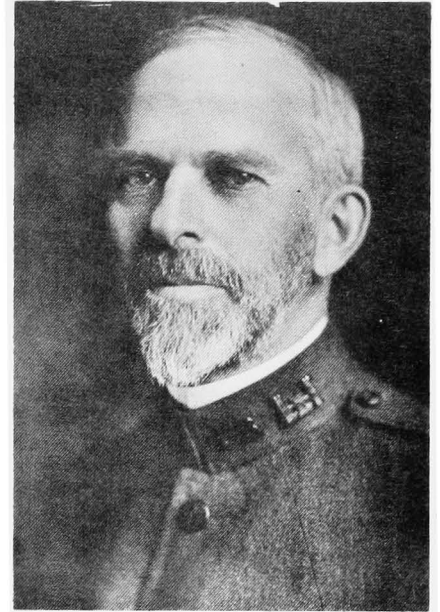
## District Engineers 1893-1906



**Captain Carl F. Palfrey**  
Dec. 19, 1893 — Aug. 16, 1894



**Lt. W. L. Sibert**  
Aug. 16, 1894 — Sept. 14, 1898



**Captain H. C. Newcomer**  
Sept. 14, 1898 — Mar. 3, 1899



**Lt. Robert McGregor**  
Mar. 3, 1899 — Mar. 13, 1901



**Captain Charles L. Potter**  
Mar. 13, 1901 — Apr. 27, 1901

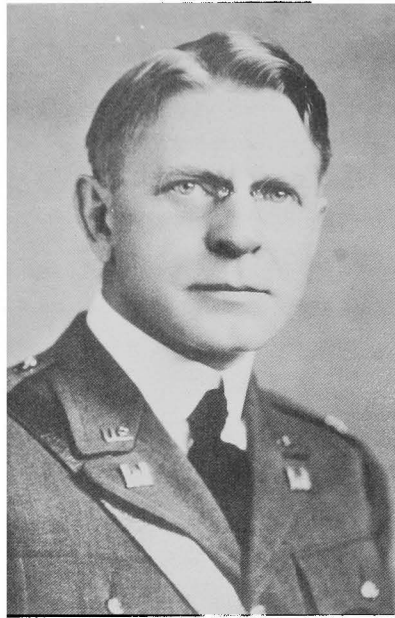


**Captain Graham D. Fitch**  
Apr. 27, 1901 — July 24, 1906

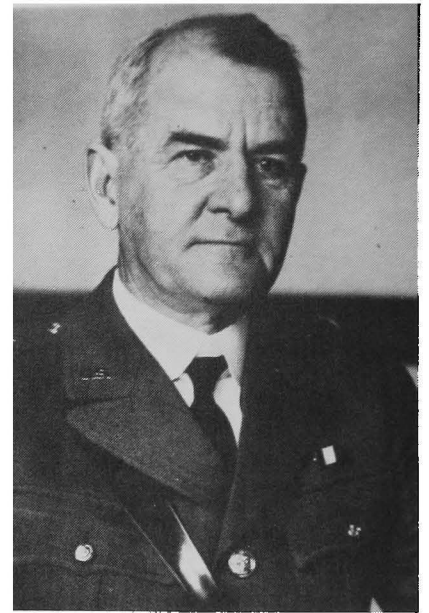
## District Engineers 1906-1915



**Captain W. D. Connor**  
July 24, 1906 — Oct. 31, 1908



**Captain G. R. Lukesh**  
Oct. 31, 1908 — Dec. 7, 1908



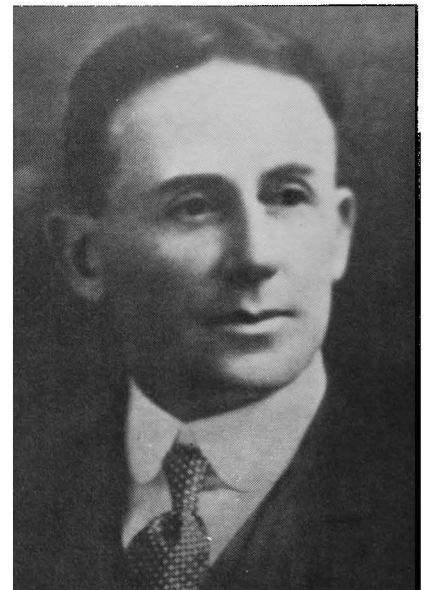
**Major M. L. Walker**  
Dec. 7, 1908 — Sept. 19, 1910



**Major Clark S. Smith**  
Sept. 19, 1910 — Aug. 30, 1912

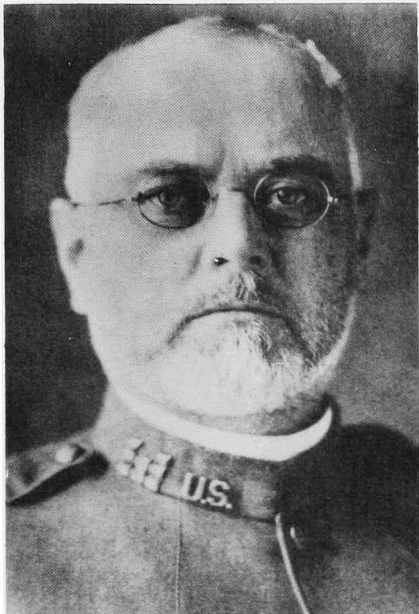


**Major E. M. Markham**  
Aug. 30, 1912 — Mar. 10, 1913  
June 10, 1915 — Oct. 13, 1915



**Captain A. B. Putnam**  
Mar. 10, 1913 — June 8, 1915

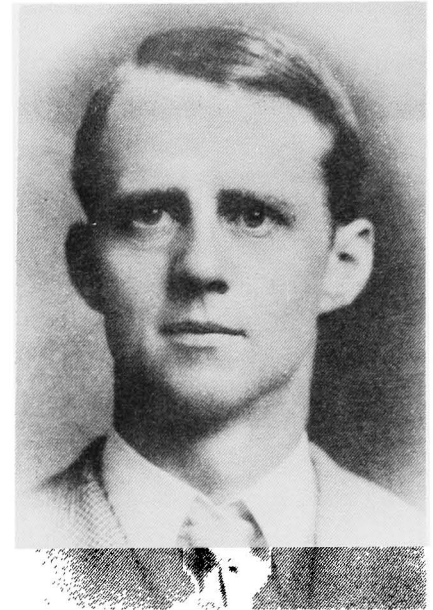
## District Engineers 1915-1921



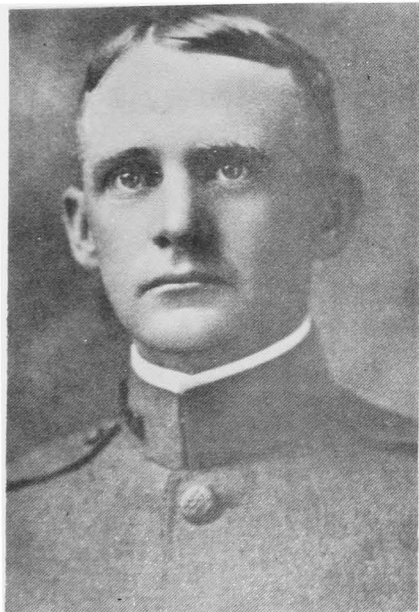
**Major E. J. Dent**  
Oct. 13, 1915—Mar. 22, 1917



**Lt. Col. G. P. Howell**  
Mar. 22, 1917—Nov. 13, 1917

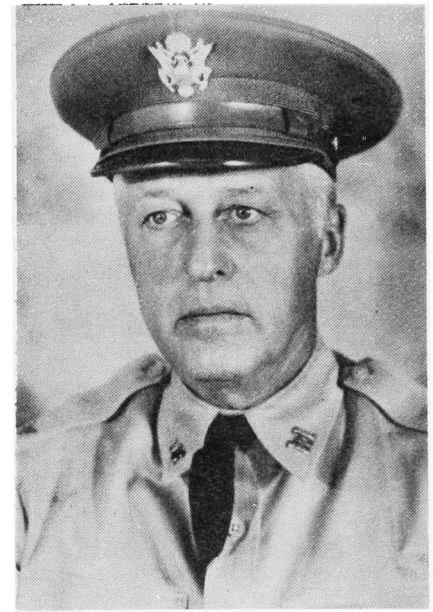


**P. R. Van Frank**  
Nov. 13, 1917—Sept. 22, 1919



**Major R. P. Howell**  
Sept. 22, 1919—Mar. 3, 1920

No major Corps of Engineer civil works activities were begun in the Little Rock District during World War I and when hostilities ceased, the National interest in river improvements died. River commerce was in a waning state and District operations, because of funding, was reduced to necessary snagging. Eventually, the District's functions were moved to Memphis April 27, 1921 where Major John N. Hodges, District Engineer, continued in command until 1923.



**Major John N. Hodges**  
Mar. 3, 1920—May 21, 1923  
(Memphis District from Apr. 27, 1921)

## District Engineers 1937-1946

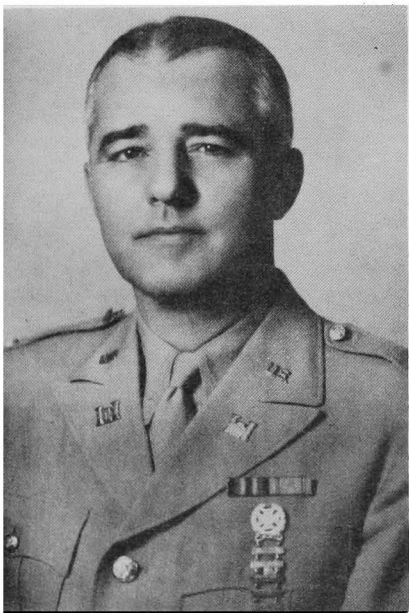


Lt. Col. S. L. Scott  
July 1, 1937 — Dec. 18, 1940

When the Little Rock District was reorganized in 1937, it included the watershed of the Arkansas River from Pine Bluff, Arkansas to the Rocky Mountains. It extended into Oklahoma, Texas, Kansas, Colorado and Missouri, as well as Arkansas. Lieutenant Colonel S. L. Scott, the new District Engineer, and seven civilian employees and the District Executive Officer, Captain Lester Rhodes, opened for business in temporary quarters at the old Board of Trade building at Second & Scott in Little Rock.



Col. T. F. Kern  
Dec. 18, 1940 — Apr. 1, 1942



Col. A. M. Neilson  
Apr. 2, 1942 — Nov. 28, 1943



Col. William A. Davis, Jr.  
Jan. 4, 1944 — Jan. 15, 1945



Col. Roy D. Burdick  
Jan. 15, 1945 — Apr. 23, 1946

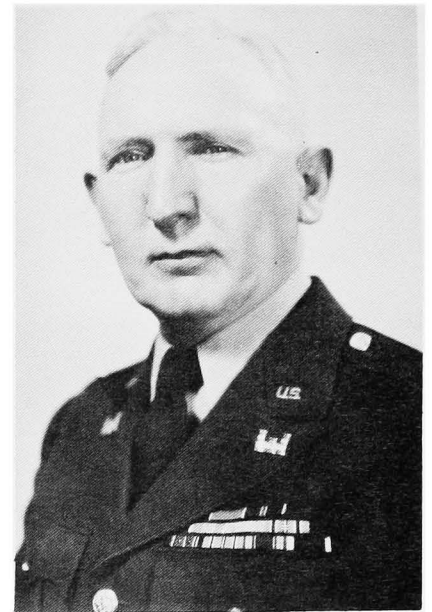
# District Engineers 1946-1958



**Col. G. E. Galloway**  
Apr. 23, 1946 — July 30, 1948



**Col. Thomas A. Lane**  
July 30, 1948 — Jan. 10, 1950



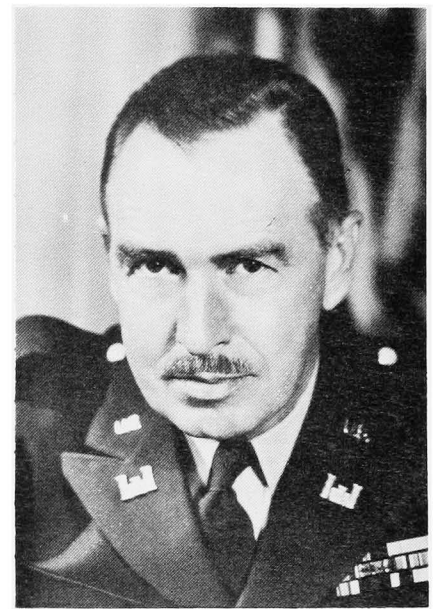
**Col. Hans W. Holmer**  
July 1, 1950 — Oct. 15, 1952



**Col. Thomas J. Hayes III**  
Oct. 16, 1952 — Aug. 9, 1953



**Col. Joe A. Clema**  
Aug. 10, 1953 — May 23, 1954

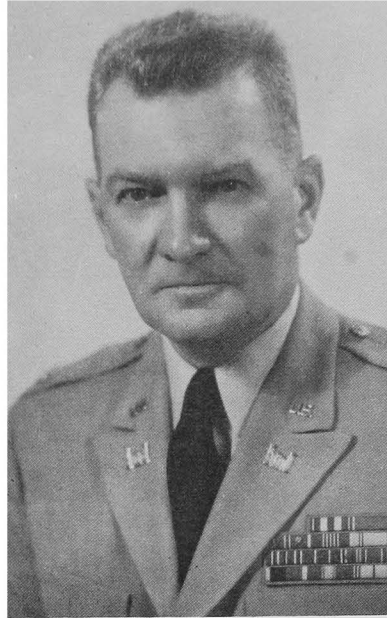


**Col. Staunton Brown**  
June 21, 1954 — Mar. 31, 1958

## District Engineers 1958-1970



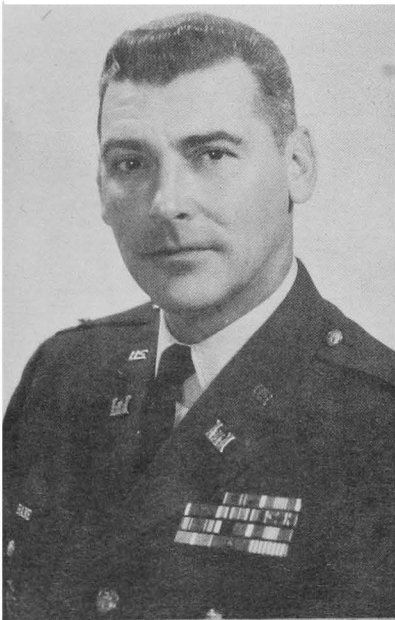
**Col. Arthur M. Jacoby**  
Apr. 1, 1958 — Aug. 6, 1961



**Col. John C. Dalrymple**  
Aug. 7, 1961 — July 8, 1962



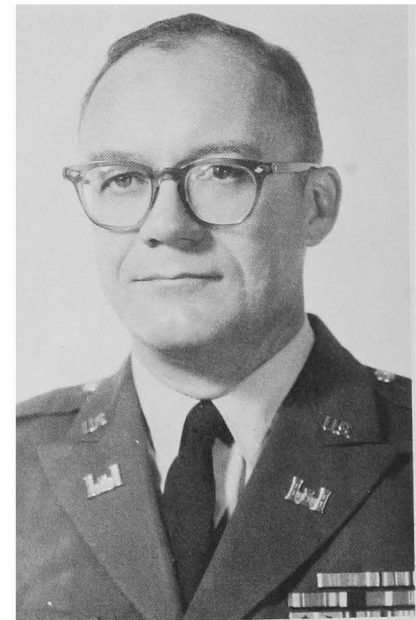
**Col. Charles D. Maynard**  
July 10, 1962 — July 31, 1965



**Col. Frank P. Bane**  
Aug. 1, 1965 — Dec. 11, 1967

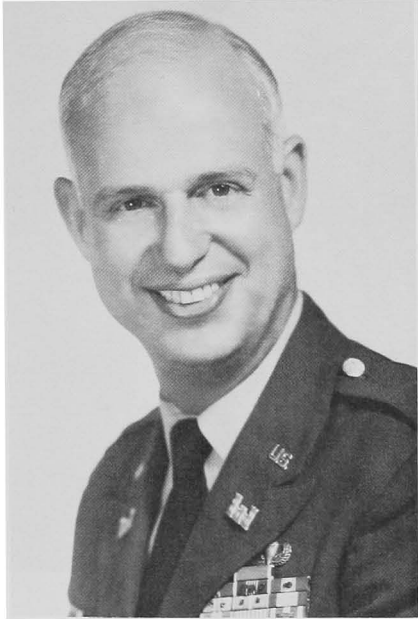


**Col. Charles L. Steel**  
Nov. 24, 1967 — July 31, 1970

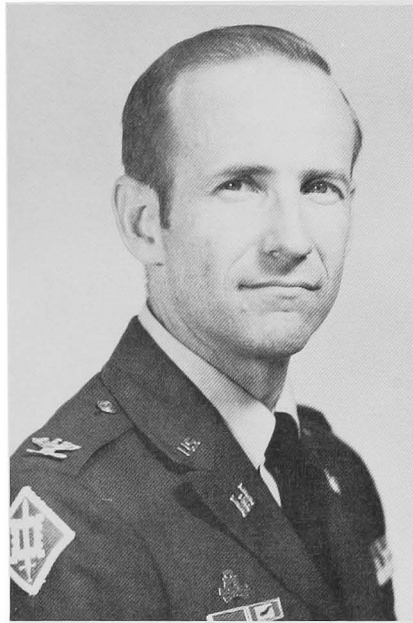


**Col. William C. Burns**  
Aug. 13, 1970 — June 3, 1972

## District Engineers 1972-1978



**Col. Donald G. Weinert**  
July 24, 1972 — July 25, 1975



**Col. Charles E. Edgar III**  
June 25, 1975 — June 25, 1978



**Col. Dale K. Randels**  
June 25, 1978 —

# The Gallery of Distinguished Civilian Employees



**Paul E. Adams**  
Chief, Comprehensive Basin Planning Branch  
1935-1971



**Robert L. Baird**  
Civil Engineer, Construction Division  
1927-1970



**Robert G. Barbour**  
Comptroller  
1929-1976



**Erwin D. Blakney**  
Comptroller  
1919-1958



**Harry G. Bozarth**  
Personnel Officer  
1926-1971

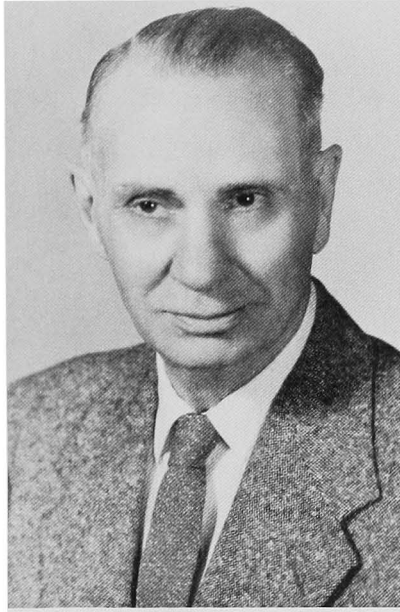


**Imogene Browning**  
Supervisor, Word Processing Section  
1938-1970

# The Gallery of Distinguished Civilian Employees



**William K. Finefield**  
Chief, Real Estate Division  
1936-1973



**Clinton M. Greer**  
Chief, Design Branch  
1932-1960



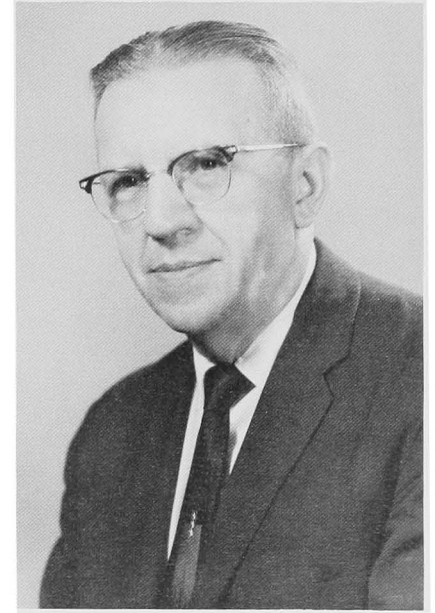
**Howard C. McKinney**  
Chief, Real Estate Division  
1933-1963



**William E. Pilcher**  
Chief, Finance and Accounting Branch  
1922-1963



**Wendell W. Ralphe**  
Chief, Construction Division  
1930-1971



**Edward F. Rutt**  
Chief, Engineering Division  
1929-1971

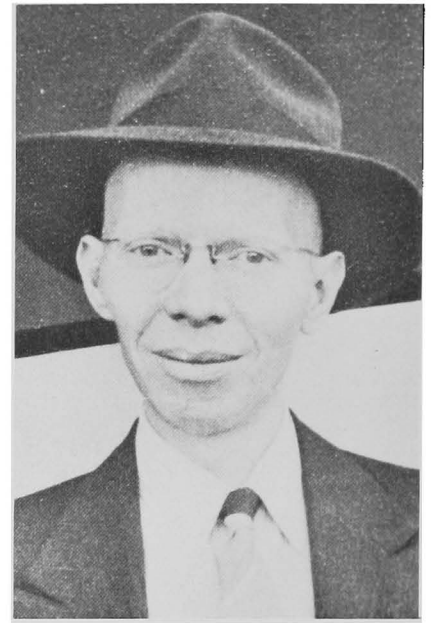
# The Gallery of Distinguished Civilian Employees



**Delbert A. Schmand**  
Chief, Construction-Operations Division  
1938-1974



**Lincoln F. Sherman**  
Supervisory Construction Engineer, Dardanelle  
1927-1963



**Flournoy W. Sims**  
Chief, Foundations and Materials Branch  
1938-1964



**Herman C. West**  
Chief, Supply Division  
1932-1969

