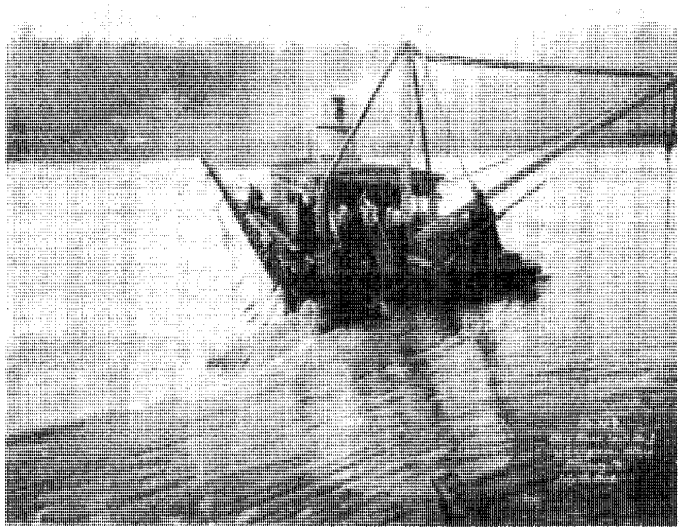
Maneuverboats were substituted for service bridges
Colonel Joseph W. Carlson



Chapter 10

A GOLIATH AT THE FORKS

"It was a godsend that the Davis Island Dam had been up the twenty-two days previous to the flood," one thankful riverman declared, "for otherwise not a boat or barge would have been saved from destruction, as the first boat adrift would have started others and they in their turn the entire fleet." The record flood of July 1888 sank at least a hundred boats on the Monongahela, but not a single boat moored in the Davis Island pool. "I have been told by two prominent coal operators," said Colonel Merrill, "that in this one experience the dam saved more than its original cost."

The July 1888 flood demonstrated graphically to rivermen and coalmen the value of the Davis Island Dam. Operation of the dam in the years after its completion in 1885 demonstrated to the people of Pittsburgh that it did not increase flood damages, that it abated effects of pollution, and that it improved municipal and industrial water supply. Smelting a ton of steel took 70 tons of water, refining a barrel of oil took 18 barrels of water, and producing one barrel of beer took 7 barrels of water; water supply was vital to riverside industry and to Pittsburgh pubs. "In my judgment," said Colonel Merrill, "the time has now come for continuing the radical improvement of the Ohio River on the plans that are in successful operation at Davis Island."

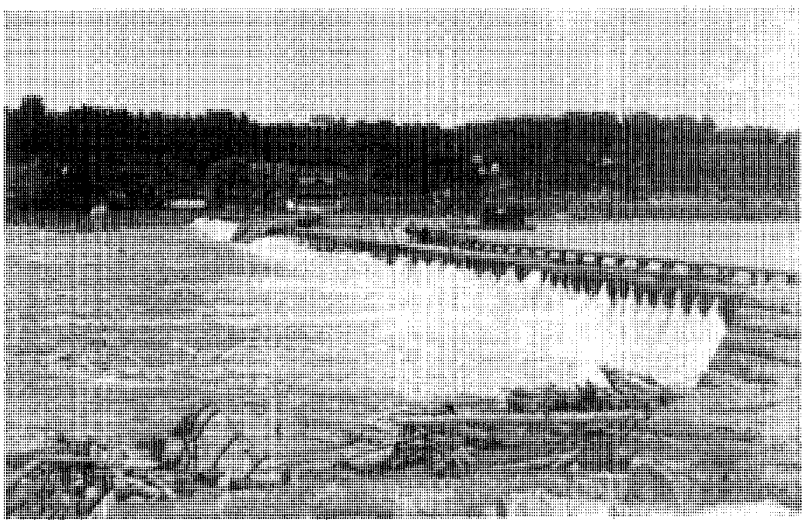
An engineer review board concurred with Colonel Merrill in 1888, finding that Davis Island Lock and Dam had benefited both navigation and industry and that opposition from rivermen had decreased. It recommended construction of more dams on the Ohio below Davis Island, but Congress did not fund the project for several years. Experiments continued, meanwhile, with operations at the Davis Island dam.

The biggest mistake in the design of Davis Island Dam had been the failure to protect against scour. Merrill had thought there would be little undermining scour at the downstream edge of the movable dam, but the mad rush of water through the openings when the dam was raised or lowered caused erosion worse than at some fixed dams. In fact, the dam was saved from destruction by sinking barges loaded with stone into the holes gouged by the river below the dam. About 40,000 tons of riprap stone stabilized with piles were eventually placed below the first dam, and all dams subsequently built on the Ohio below Davis Island were so protected.

Merrill had substituted Pasqueau hurters and maneuverboats for service bridges to operate the wickets of the navigable pass, but had retained service bridges above the three weir sections. Service bridges were metal trestles located upstream of the weir wickets. They supported a small rail track along which the damtenders rolled a dolly carrying a winch to maneuver the wickets. That operation was hazardous and the service bridges were wrecked by drift and runaway barges in 1887 and 1888. Those problems resulted in increased reliance upon a beartrap weir installed at Davis Island Dam in 1889 to maintain pool levels instead of maneuvering the wicket weirs.

Merrill and Martin began construction of a 52-foot wide beartrap "drift-chute" with wooden leaves to close a 9.3-foot high chute adjacent to Weir 2 of Davis Island Dam in 1888. Removal of a pier made Weir 1 part of the navigable pass. Rivermen highly approved removal of the pier and widening the pass,

Davis Island lock and dam, July 1891
Note remains of service bridge in foreground.



U.S. Army Engineer District, Louisville

for several tows had wrecked while flanking through the pass and the steamer *J. N. Bunton* had rammed the pier and sunk with loss of four lives.

"The drift-gap consists of two parallel walls of masonry, between which is a bear-trap gate, closing a clear opening of 52 feet," Colonel Merrill explained. "This gate is handled by opening or closing valves, which control culverts built in the masonry walls and connecting with the spaces under the gates. With this device it is practicable to fill the bay above the beartrap with drift, and flush it through by closing one valve and opening another. The advantage of this apparatus over any other is due to the fact that it can be lowered and raised by one man without special exertion and regardless of the head of water."

The "Johnstown" flood of May 31, 1889, destroyed the cofferdam and construction equipment, but William Martin finished the beartrap by the end of the year. Beartrap operations also presented problems. As an instance, on July 16, 1890, hay from a burning stable thrown into the river at Pittsburgh drifted down and clogged the beartrap culverts. The beartrap leaves sank to their foundations, and when the hay was cleared from the culverts the beartrap leaves popped up, breaking their safety chains and locking in upright position. The Engineers learned, nevertheless, that beartraps could pass drift and sudden rises better than chanoine wicket weirs. They installed large beartraps, usually two, in the dams below Davis Island, but substituted steel for the wooden leaves.

The original Merrill rolling lockgates, built of pine with Howe trusses, supported by cast iron wheels shrunk onto axles, and moved by chains and drums in and out of their recesses in landward lockwalls on an 11.5-foot gage rail track, often broke the wheels, axles, and chains. Since the gate recesses had only a foot clearance on each side of the gates, the gates had to be raised with derricks to allow men access to repair the undercarriage or to excavate silt that was sometimes seven feet deep. A steel caisson gate with Pratt truss, sturdier throughout, replaced the wooden gate in 1896, and covers for the recesses were devised to reduce silt accumulation, but the problems were never entirely eliminated. Use of Merrill rolling lockgates at the locks where originally installed continued, nevertheless, until replacement structures were completed.

Merrill left William Martin in charge of operations experiments at Davis Island in 1885 and hired James W. Riggs as first lockmaster, who was succeeded in 1889 by his son U. Kidd Riggs. Merrill expected to operate the lock and dam with four permanent employees assisted by temporary help when the dam was maneuvered or repaired, but soon learned that operation complexity and hazards precluded much use of temporary labor.

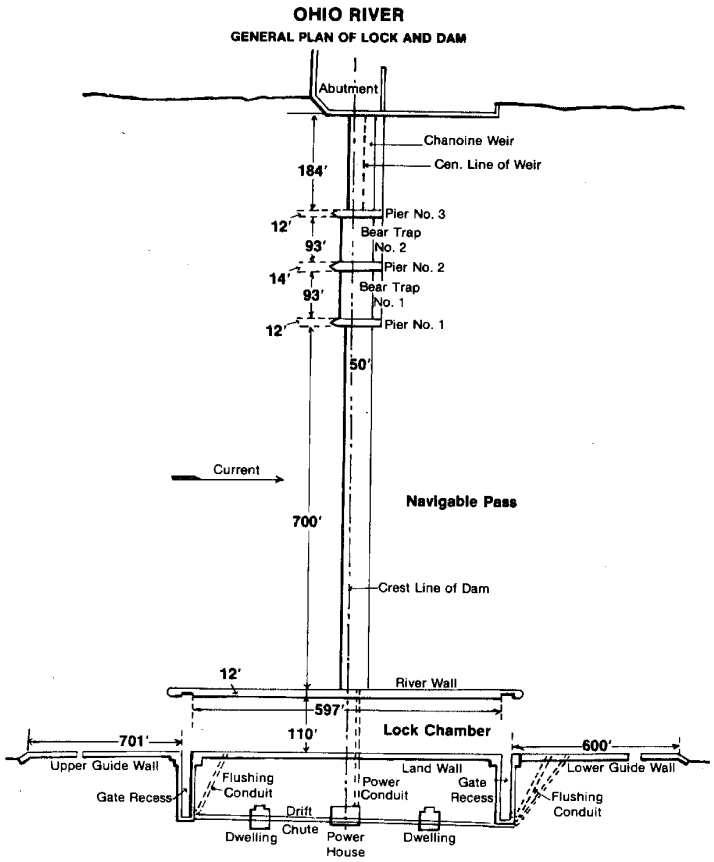
A man in a skiff and three men below the dam were repairing a wicket in 1887 when its support broke. The falling wicket barely missed the men working below, and the fellow in the skiff saved himself by jumping onto an adjacent wicket as his skiff went over the dam. Near disaster occurred on a Sunday in 1888 when telegraph offices were closed and Martin received no warning that an ice gorge was coming out of the Allegheny. At its approach, the damtenders ran out on the service bridges to lower the weir wickets, but the ice mass lodged on the service bridges, forcing the workers to the bank for safety and crushing the maneuverboat. Martin got the dam down by chartering two steamboats,

lashing barges between them, and butting the wickets from the downstream side until they fell and released the ice gorge. Inexperienced temporary labor was no help in such situations and Colonel Merrill increased the permanent staff to eight men, who worked twelve hour shifts. He also had telephones installed to furnish warning about upstream river conditions.

First maneuverboat was a small scow from which the damtenders raised and lowered the wickets of the navigable pass with hand-powered winches and cables, but the labor exhausted the men and in 1887 Martin built a flatboat equipped with steam engine and derrick for the job. The flatboat was replaced in 1895 with a steel-hull boat. The old maneuverboat became a "needleflat," used to carry square timbers placed in the spaces between the wickets to reduce flow from the pool at extreme low water.

Service at Davis Island Lock and Dam, located at the head of the Ohio where slope was steep and river flow swift, where traffic was heaviest, and where floods and ice gorges could come suddenly from either the Allegheny or the Monongahela, was rigorous and risky. Damtender Harry Weibush was killed in 1899 when a boiler powering the lock machinery exploded (seventeen days after it had passed safety inspection). The fast launch *Wenonah*, stationed at Davis Island under Inspector S. H. Fowler to serve the lock force and to blow wrecked boats out of the channel with dynamite, got its prop tangled in a line while trying to assist the towboat *Emily Jung* in 1911 and was run down by the *James Moren*. Lockmaster Riggs saved his life by jumping from the *Wenonah* to the *Moren* at impact, but engineer James W. Dickey was sucked under the *Moren* and drowned.

Despite troubles and risks, basic operations methods used at all fifty of the locks and movable dams built on the Ohio by 1929 were worked out, and the experience acquired at No. 1 resulted in improved design at the downstream dams. By the time Davis Island Lock and Dam was replaced in 1922, nearly every part of the structure save lockwalls and



Dr. Leland R. Johnson

dam foundation at one time or another had been renewed or modified for improved operation and to prolong the life of the structure. Perhaps not "esto perpetua," as Merrill had hoped, but long enough to reimburse its costs several times and to have major impact on waterway engineering and design.

Bridge Rebellion on the Allegheny "Goliath" Sibert made a serious mistake in 1902: he spoke to the Engineers' Society of Western Pennsylvania. He told the members that John Arras had nearly finished Herrs Island Lock and Dam (No. 1), had No. 2 at Six-Mile Island and No. 3 at Springdale under construction, and had authorization to extend slackwater to Monterey, 80.5 miles above the mouth of the Allegheny, but low bridges had destroyed steam packet service on the river and hampered other commerce.

Captain William B. Rodgers
Carnegie Library of Pittsburgh

"We see on the Allegheny River the only steel boat-building establishment in Pittsburgh, launching the hulls of its boats and floating them under the Union bridge, and then building the upper part in the unobstructed river below," Sibert said. "We see manufacturing plants on the Allegheny hauling their products by wagon to the Monongahela or Ohio River for shipment to the lower Mississippi River points, paying half as much for this hauling as it costs to transport the same material 2,000 miles to its market." The bridges would have to be raised to clear the way for commerce and also to prevent flood damages. He warned that eventually a flood and ice gorge would carry away the bridge superstructures, which would lodge on bridge piers below, form ice gorges, and cause appalling destruction in nearby communities.

Thomas Roberts, William Martin, and James Harlow of the Pittsburgh Engineer District had been charter members of the Engineers' Society, District personnel commonly participated in Society functions, and Sibert was a member. But Sibert's address to the Society on "Full Use of the Rivers at Pittsburgh" brought calls for his removal from the post of District Engineer. It was said he had prejudged the Union Bridge case and prejudiced himself.

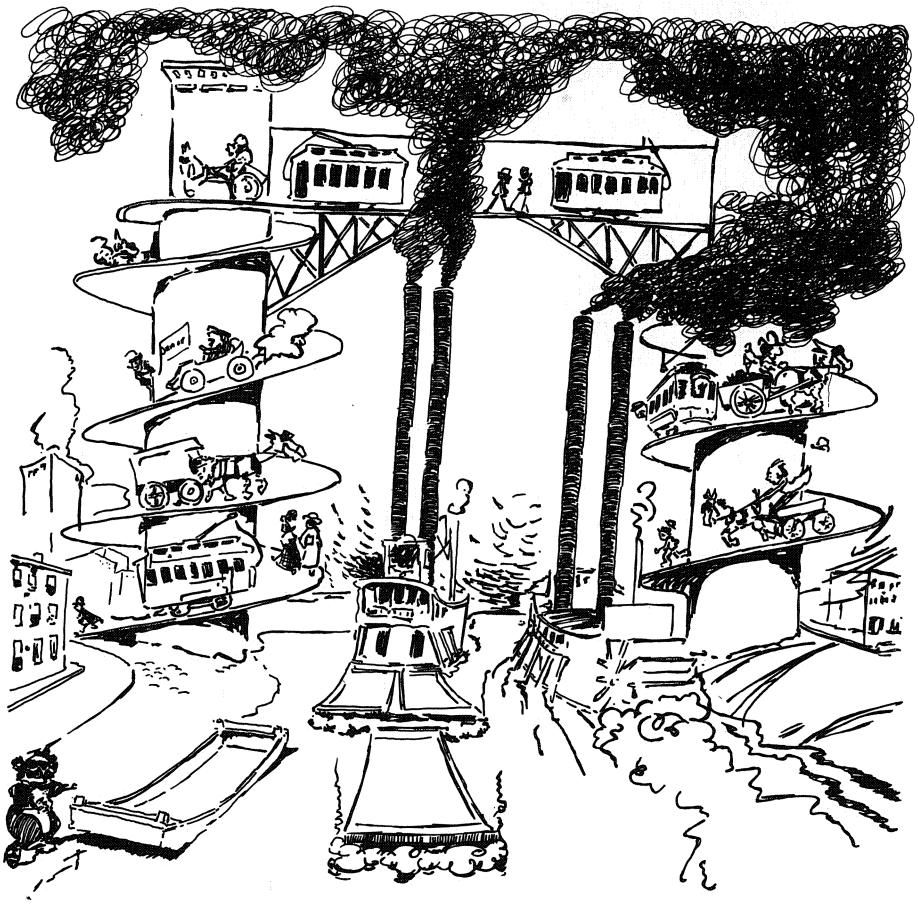
Major William L. Sibert, a large fellow with the nickname "Goliath" because he had roomed with diminutive David Galliard at West Point, learned river engineering under the tutelage of Colonel Merrill and became Pittsburgh District Engineer in 1901. On arrival at Pittsburgh, he landed in the Allegheny bridge controversy, begun in 1899 when Congress gave the Engineers blanket supervision over navigation obstructions, including low bridges.

The Army Engineers had built many bridges: ponton bridges, trestle bridges, military road bridges, aqueduct bridges, and bridges on the National Road. Captain John Sanders in 1838 had prepared the original plans for a suspension bridge over the Ohio at Wheeling. From time to time, Congress gave the Corps jurisdiction over specific streams and individual bridges, and made the authority general in the River and Harbor Act of 1899, directing the Corps to prevent obstruction of all navigable streams.

The Allegheny bridge problem had a long history, perhaps beginning in 1849 when rivermen of Wheeling tried to turn the tables on Pittsburghers by demanding raising of the bridges over the Allegheny as a nuisance to navigation and a violation of the Northwest Ordinance of 1787. Upset by Pittsburgh's demand that the Wheeling bridge be raised, people of Wheeling signed a petition advising Congress that: "aqueducts and three bridges have been erected across the Allegheny supported by innumerable piers, so constructed that boats and rafts cannot be navigated amongst them without danger to life and property, and these bridges and aqueducts are so low that steamboats cannot pass under them in any stage of the river while at high flood. The water reaches the woodwork of these structures, which completely shuts off every description of navigation, even descending rafts and keels."

All appeals for raising the Allegheny bridges were ignored, however, until the Allegheny River Boatmen's Association, founded in 1897 and later renamed the Allegheny River Improvement Association, took the case to the Corps of Engineers in 1900. Chief ringleader of the campaign to raise the bridges was Captain William B. Rodgers, owner of a dredging firm and unofficial successor to John Dravo as head of the Pittsburgh rivermen's lobby. Rodgers had been pilot of the *Little Bill* that was caught in a crossfire between striking workers and Pinkerton detectives at the Homestead steel mill in 1892. Captain Dravo's chief goal had been freeing of the Monongahela. Captain Rodgers had two related goals: raising the Allegheny bridges and slackwater navigation from Oil City to Cairo.

Captain Rodgers and his colleagues presented their charges against the Allegheny bridges at hearings before Major Sibert in 1902 and 1903, and railroads, private companies, and local



Cartoon ridiculing Colonel Sibert
Post Gazette - November 30, 1902

governments owning the bridges offered acrimonious opposition. Crowds attending were so large that Sibert adjourned the hearings to court rooms, where they took on the trappings of a trial.

"Perhaps never before in the history of the Engineer Corps was one of its members ever beset by abler and more persistent attorneys on the contending sides," declared Thomas Roberts. "The lawyers," Roberts said, "threw up such clouds of argument that the poor germs of truth were totally hidden from view."

Sibert's duties at the hearings more resembled those of judge than engineer. When an attorney learned from Roberts what Sibert was paid, he said: "Well, that's pretty damn tough. The Major has mistaken his calling. In a year's time he ought to be able as a consulting attorney to earn five times that pay. Where did he get his ideas of law, anyhow?" Sibert had never studied law, but had served under Chief of Engineers Henry M. Robert, author of *Robert's Rules of Order*, and he did his utmost to prevent legal machinations from obscuring the facts. The facts were that packets could not pass under the bridges an average of 52 days each year and small towboats were obstructed 17.7 days a year. Sibert recommended in 1904 that the government require raising the bridges.

Attorneys for the Union Bridge company, owners of the bridge nearest the mouth of the Allegheny, filed an opposition brief declaring that Sibert had prejudiced himself in his address to the Engineers' Society of Western Pennsylvania in 1902, that proceedings at the "mock" trial had been barbarous, that Sibert had even allowed testimony from "the ignorant class of people that generally composes the body of rivermen in the United States." For some time afterwards, attorneys who promenaded along the Pittsburgh wharves risked their lives.

The attorneys and bridge owners approached local congressmen to demand Sibert's removal from Pittsburgh. Captain Rodgers told the congressmen they would answer at the next election if Sibert were transferred. The Major asked the Chief of Engineers to bring libel suit against the attorneys, but the Chief refused, telling Sibert the charges from the attorneys would "injure those who prepared them more than those against whom they are directed." Sibert remained at Pittsburgh until 1907, when General Goethals called him to Panama.

The Allegheny bridge ruckus continued throughout the first quarter of the 20th century. Secretary of War Elihu Root in 1904 decided the bridges were not "unreasonable" obstructions, but his successor William Howard Taft disagreed and

appointed an investigating board which in 1911 recommended the bridges be raised, only to be overruled by a new Secretary of War.

John Arras and the Pittsburgh District completed Locks and Dams 2 and 3, extending slackwater to Natrona, by 1908, but work stopped there pending settlement of the bridge question. Congress in 1912 made construction of Locks and Dams 4-8 to extend slackwater on to Rimerton contingent upon raising the bridges. Chief of Engineers William M. Black, a former assistant to Colonel Merrill, inspected the Allegheny bridges in 1916. Black thought opposition to raising the bridges as ill-advised as the opposition he had encountered in 1881 to the Davis Island project; he ordered District Engineer Francis Shunk to submit a new report on the subject to Secretary of War Newton Baker.

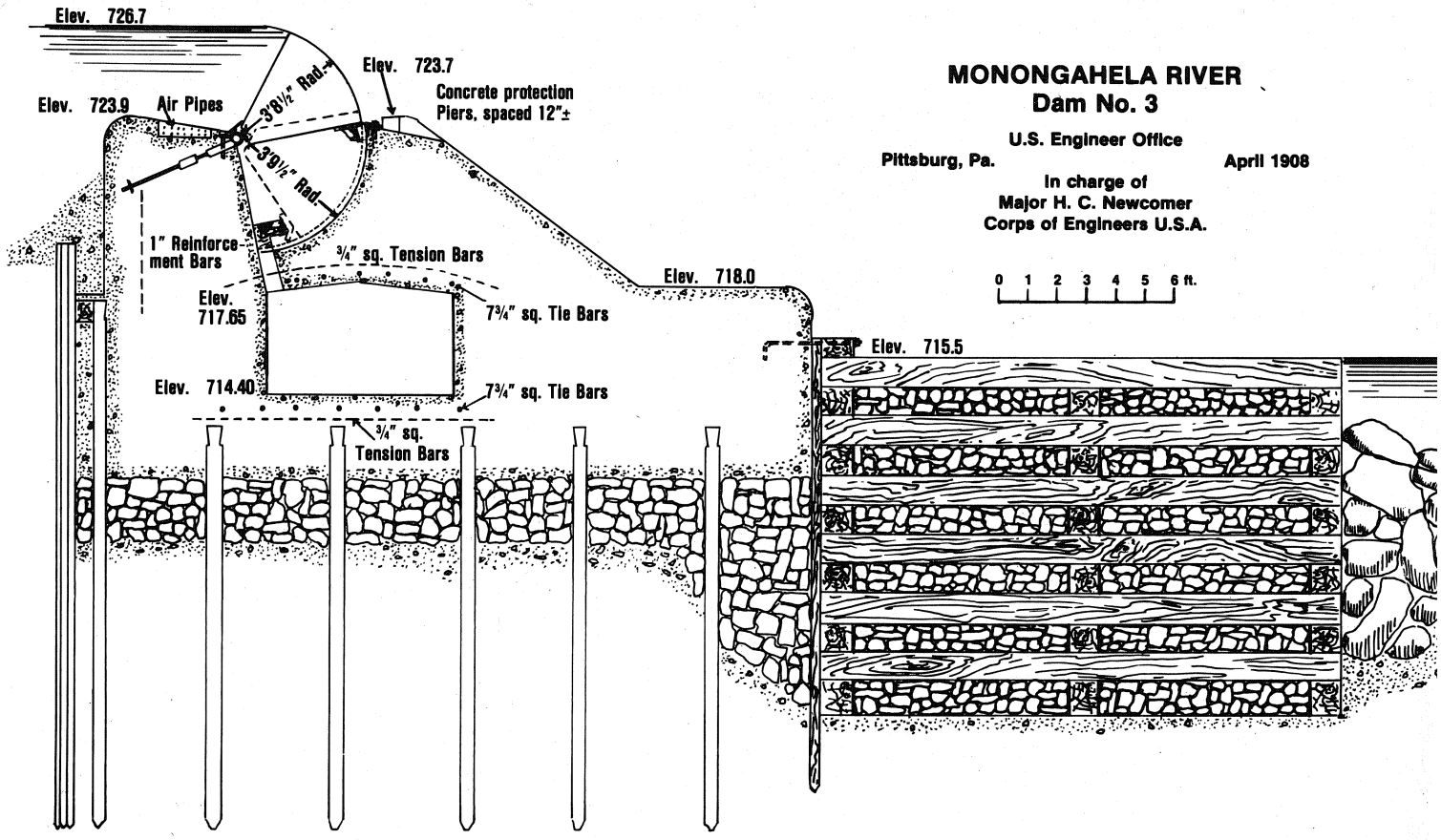
On January 14, 1917, Secretary Baker made a secret visit to Pittsburgh and joined John Arras aboard the surveyboat *Kittanning* on a trip up the Allegheny. Arras took along the snagboat *General Theodore Schwan*, which had clearance requirements similar to those of packets, to graphically illustrate the bridge problem, though he did not emulate Edwin Stanton at Wheeling by ramming the boat into the bridge spans. Baker ordered, on March 23, 1917, that the bridges be raised, saying: "I have a confident feeling that the future of the city of Pittsburgh is of tremendous importance to the Nation, that by the order which I am now making I am freeing a great natural highway to contribute to the further expansion and growth of the city, and freeing the Allegheny River from obstructions which have until now prevented it being used, as it ought to be used, as a valuable part of the harbor of the city and a valuable artery of trade."

Enforcing Baker's order was deferred during the First World War, but in October 1920 General Lansing H. Beach, another assistant to Merrill who had succeeded William Black as Chief of Engineers, traveled to Pittsburgh to get the job underway. He met the Allegheny County commissioners and the Pittsburgh city council, who owned the bridges. They told him they expected the November election to change the national administration and put in office a new Secretary of War who would rescind Baker's order. "Don't count on it," snapped the General. "I will be Chief of Engineers for several years and I intend to see those bridges raised!"

The new Secretary did not rescind the order, and General Beach returned to Pittsburgh in January 1922. He found that local authorities had not begun to raise the bridges and had not made plans for so doing. He came back in April. Still no progress. Instead, he heard vague threats of a new Whiskey Rebellion, or rather a "Bridge Rebellion." With patience exhausted, General Beach returned to Pittsburgh a fourth time on January 25, 1923, and delivered his ultimatum at the Duquesne Club:

> *The War Department has been long suffering--very patient--but this is at an end. It has become tired of asking the County Commissioners: "What have you done?" Now we will tell them what to do.*
>
> *The plans for the Seventh and Ninth street bridges must be in the hands of my department by March 1. If they have complied, they will be instructed on or before April 1 what further the department will require. If they fail to comply with this order, legal proceedings will be immediately begun to enforce them. This will mean a fine of $20,000 per month, which Allegheny County can shoulder until they have been carried out.*

One determined soldier accomplished in 1923 what it had taken an army to do in 1794. Allegheny County surrendered, and when the General returned for inspection in July the work was underway. By 1929, the bridges had been moved, rebuilt, or modified to clear an adequate channel for navigation, and the Pittsburgh District had resumed construction of the Allegheny slackwater project. Had Allegheny County wished it done, the Corps of Engineers could perhaps have removed the bridges without cost, simply by dropping the paperwork generated by the thirty-year controversy into the Allegheny above the bridges at flood time.



Monongahela Reconstruction "A serious and remarkable disaster has occurred," reported Major Charles Powell. "On December 13, 1899, a passing freight train jarred the landwall of Lock 2 at Port Perry on the Monongahela loose from its backing and it fell on a towboat and tow in the chamber. Immediate repairs are necessary; in fact, all the locks and dams we acquired from the navigation company need repairs or rebuilding."

Thomas Roberts had Lock 2 pumped out for repairs when "Goliath" Sibert, successor to Powell as District Engineer, made inspection. Sibert looked at No. 2, built in 1841 with a second lock added in 1853, saw that collapse of the entire structure was imminent, and shook his head: repairs were a waste of time and money. As he and Roberts traveled upriver to inspect the other structures, Roberts explained how, over the years, he had propped lockwalls with stonefilled cribs to prevent their toppling over, how he had dropped tons of stone into lock chambers to hold buckled floors down while they were pinned with anchor bolts, and how he placed 30-inch timber flashboards atop the crests of the leaky dams to hold pools for navigation during droughts.

Recognizing complete failure of the Monongahela system was possible, even probable, Sibert went immediately to Washington to outline the situation for the Chief and to congressional committees. He explained that blockage of Monongahela navigation would mean unheated homes and plants without power from Pittsburgh to New Orleans, plant shutdowns and unemployment, and, in short, economic disaster. His argument was fortified when Lock 3 caught fire and burned for two months; fill behind the lock guidewall, dredged from the river, had included coal waste from riverside mines and wrecked coalboats.

Sibert proposed extensive remodeling of locks and dams 1 and 4 and construction of new locks and dams replacing Nos. 2, 3, and 5. All were to have double locks, each 56 feet wide and 360 feet long to accommodate a towboat and three barges in a single lockage. The dams were to have movable crests to supply deeper pools at low water. Congress approved emergency replacement of No. 2 in 1902 and approved the entire reconstruction project the following year.

Principal Engineer Roberts, assistants John B. Dimmick, H. W. Brecht, and William D. Fairchild, and Captains A. E. Waldron, F. C. Boggs, and Lewis M. Adams supervised reconstruction of the lower Monongahela structures and finished the job by 1912. They rebuilt No. 6 with a new double lock in 1915 and also undertook improvements at Nos. 7, 8 and 9.

Chief innovation on the reconstruction project was use of adjustable crests atop the fixed dams to obtain an extra three-foot pool depth. Roberts had installed flashboards on Monongahela dams each summer after 1893 by inserting iron pins into bored

holes in the tops of the dams and securing two courses of planks to the pins. A party of a dozen men could place flashboards on the 962-foot long Dam 1, with a foot of water flowing over its crest, in a day. Drift often smashed the boards, but replacement was cheap. When the lower river dams were rebuilt from 1904 to 1912, Chittenden drum weirs at Dams 2 and 3 and Betwa wickets at Dams 1 and 5 were substituted for flashboards.

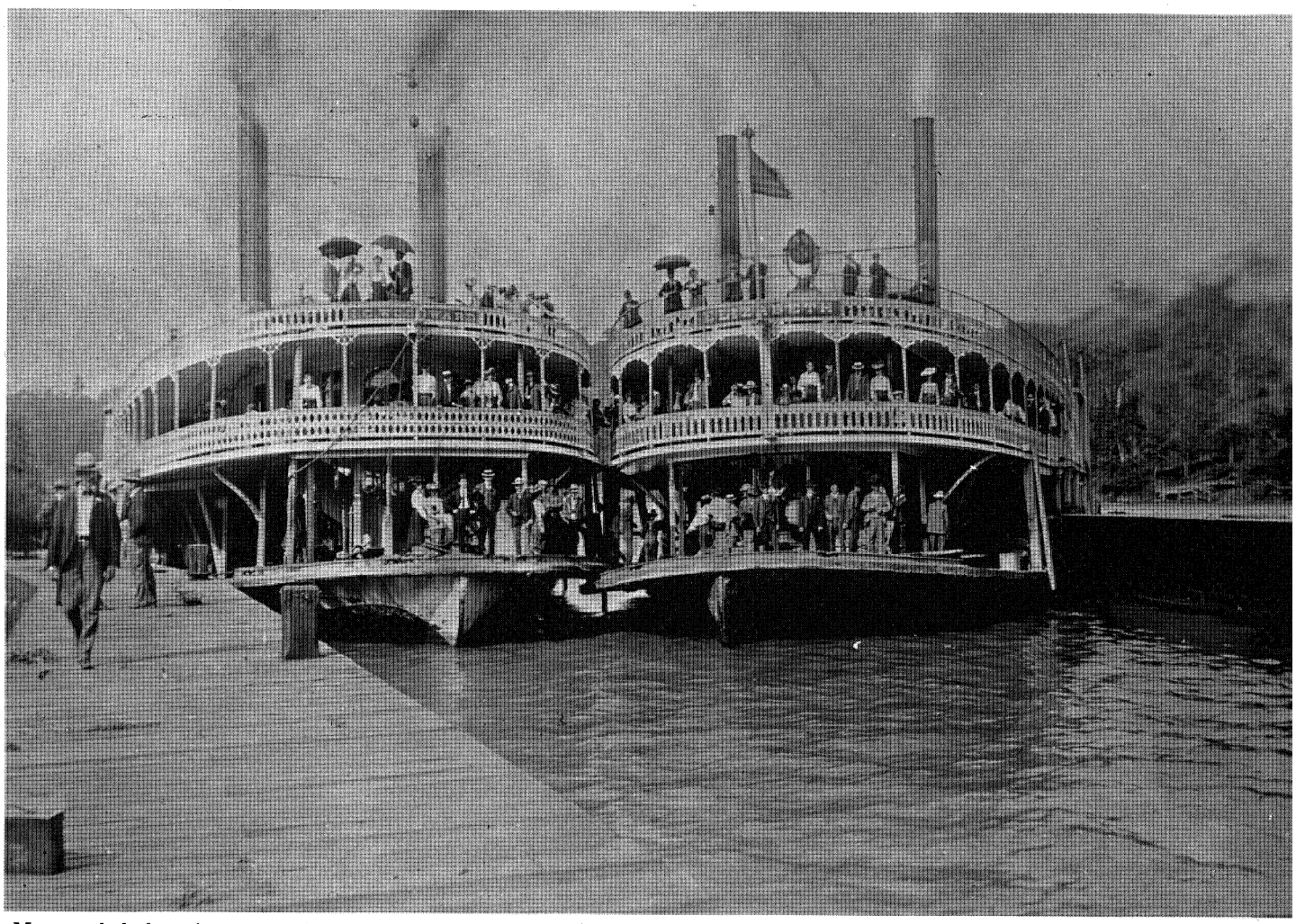
General Hiram M. Chittenden, who surveyed Lake Erie to Ohio River canal routes in 1896, directed preservation of Yellowstone National Park, revived the Charles Ellet reservoir scheme, and, in spare time, wrote monumental histories of the American West, also invented the drum weir. As an experiment, Chittenden drum weirs were placed on the back channel dam at Davis Island in 1904 and on Dams 2 and 3 on the Monongahela in 1906 and 1908. The hollow metal drums, placed in cavities in the top of the fixed dams and raised by piping compressed air into them to make them buoyant, could be easily lowered to pass drift, ice, and flood water. The problem was getting them back into position to hold additional summer pool: they leaked air and filled with water and mud, drift blocked their valves, and acid wastes from Monongahela mines corroded them in short order. Roberts still had to place flashboards so his crews could work on the drums to get them up, and annual repair costs were ten times the costs of flashboards. "If many dams are provided with the drums," warned Roberts, "the repairmen will have but little time for other work."

District Engineer Henry C. Newcomer launched a worldwide search for a substitute for the Chittenden drum weirs and found it at Betwa Dam at Paricha, India, where the Royal Engineers had 300 steel shutters or wickets, each 12 feet wide and 6 feet high, on the crest of the 3,600-foot long Betwa Dam. Major Newcomer realized Monongahela ice and drift might interfere with Betwa wickets, which were designed to trip automatically when water reached a certain height, but they could be built for a third the cost of drum weirs so he directed they be placed on Dams 1 and 5 as an experiment.

"It is absolutely impossible to make them trip automatically at the desired height," Colonel H. W. Stickle admitted to the Chief of Engineers in 1918, after several years of experimentation. Betwa wickets would not serve on the Monongahela: boat waves tripped the wickets at inopportune moments; drift lodged on wicket bases and prevented tripping at the proper time. Besides, riverside industry wanted fixed crests to stabilize water supply, so Stickle recommended an end to experiments with movable crests and embedding the drums and wickets in three feet of concrete. It was done.

On to Fairmont "Inflation has been a real problem in this District," "Goliath" Sibert wrote in 1901 while explaining his worries about the project to build six locks and dams between Morgantown and Fairmont. Because prices had increased by more than 30% between 1897 and 1901, the first contractor for the six locks and dams had lost money and abandoned his contract after only 10% of the work was finished. He was concerned that the new contractors might also fail, and even if they were successful there was still the low railroad bridge that would prevent boats from steaming up to Fairmont. Sibert had problems, but he would receive little sympathy from West Virginians who had sought the project for more than a half century and who would be angered by any further delays.

Ever since General John G. Jackson had begun construction of a slackwater project in 1817 on West Fork of the Monongahela, people of the upper Monongahela basin had sought improved navigation. After private and state efforts had failed, they had appealed to Congress and had won a survey of the upper Monongahela in 1875. That year, Thomas Roberts made the survey and reported favorably on construction of six locks and dams, Nos. 10 through 15, to extend slackwater to Fairmont and permit development of coal and other area resources, but Congress did not fund the project until 1892 and then provided funds sufficient only for Lock and Dam 10. Congressman Alston G. Dayton of Philippi and other West Virginians persevered in their campaign on behalf of the project until Congress made sufficient funds available in 1898 for construction of



Monongahela boat jam

all six concrete dams with locks, each 177 feet long and 56 feet wide in the chamber.

Engineers Philip Golay, I. N. Lucas, J. A. McCulloch, and J. L. Callard at a District suboffice at Morgantown supervised the work of contractor C. I. McDonald, who won the contract for construction of all six structures and began work in 1898 at Nos. 10 and 11. Inflation eroded the contractor's capital, however, and by the autumn of 1899 he was in hot water on the Monongahela.

District Engineer Charles Powell learned McDonald was working his men 33 hours at a stretch until they were nearly sleepwalking. "You are working your men until they are incompetent," he warned the contractor. "A sand and gravel mixture was actually placed in the lockwall because sleepy men at the mixer wholly omitted cement," said Powell. "You must work your men in shifts." McDonald threw in the towel after finishing only parts of Nos. 10 and 11.

Under strict surveillance of Major Sibert and his inspectors, the new contractors, Baker and Judson at Nos. 10 and 11 and T. A. Gillespie at Nos. 12 to 15, went to work vigorously in 1901 to finish the job before inflation finished them. They had the six locks and dams ready for traffic by the end of 1903, but Major Sibert could not open the river into Fairmont until a railroad bridge 1.5 miles below Fairmont, which had only 27.5 feet clearance over the channel, was removed.

At a hearing in early 1904, railroad attorneys asserted that raising the bridge was unnecessary because river commerce at Fairmont amounted to only 152 tons in 1903 and would never amount to a hill of coal. Major Sibert told the Chief of Engineers that when the company built the bridge in 1884 it had agreed to raise it when the slackwater project was built, that commerce on the upper Monongahela below the bridge in 1903 had included 92,831 tons of freight and 18,682 passengers. He produced a photograph of the steamer *Isaac Mason* and ten barges loading 4,000 tons of lumber just below the bridge because it could not get above. He asked the Chief to bring charges of perjury against the company attorneys and to require the raising of the bridge. Legal action ceased, however, when the company agreed to do what it had promised in 1884.

The tiny steamboat *Gazette* got under the bridge on March 18, 1904, and was first to reach Fairmont on slackwater. The steamers *Wabash, Pastime, J.O. Watson* and the towboat *John F. Klein* entered the

Fairmont trade, and, after the bridge had been removed, the large sidewheel packet *Columbia* reached Fairmont on May 3, 1907, and inaugurated regular packet service. The Parkers Run Coal Company, located in the pool of Dam 15, began coal delivery by river to McKeesport Tinplate Company.

Monongahela Boat Jam Sunday morning, July 20, 1902. Pilot Frank Ganoe backed the *Elizabeth* from Morgantown wharf and left for Pittsburgh. Frank Williams moved the *I. C. Woodward* away from the wharf at the same time. The *Elizabeth* belonged to the Monongahela River Packet Company, the *Woodward* to the rival Pittsburgh, Brownsville and Morgantown Packet Company, and the pilots of the competing boats were determined to be the first to Lock 9 at Hoards Rocks, for the first boat through the lock would win most of the freight and passengers waiting at riverside above Pittsburgh. Nearly side by side, they raced down the ten-mile pool of Dam 9 and put on full steam as they hove in sight of the lock.

Lockmaster Benjamin Hoard heard their whistles and strode out on the lockwall to welcome them. He watched with amazement as the two boats, smoke boiling from the stacks and paddlewheels churning the water, bore down on the lock. Frantically, he tried to wave them off. Neither pilot slowed, neither gave an inch, and the two sidewheelers simultaneously crunched into the lock entrance.

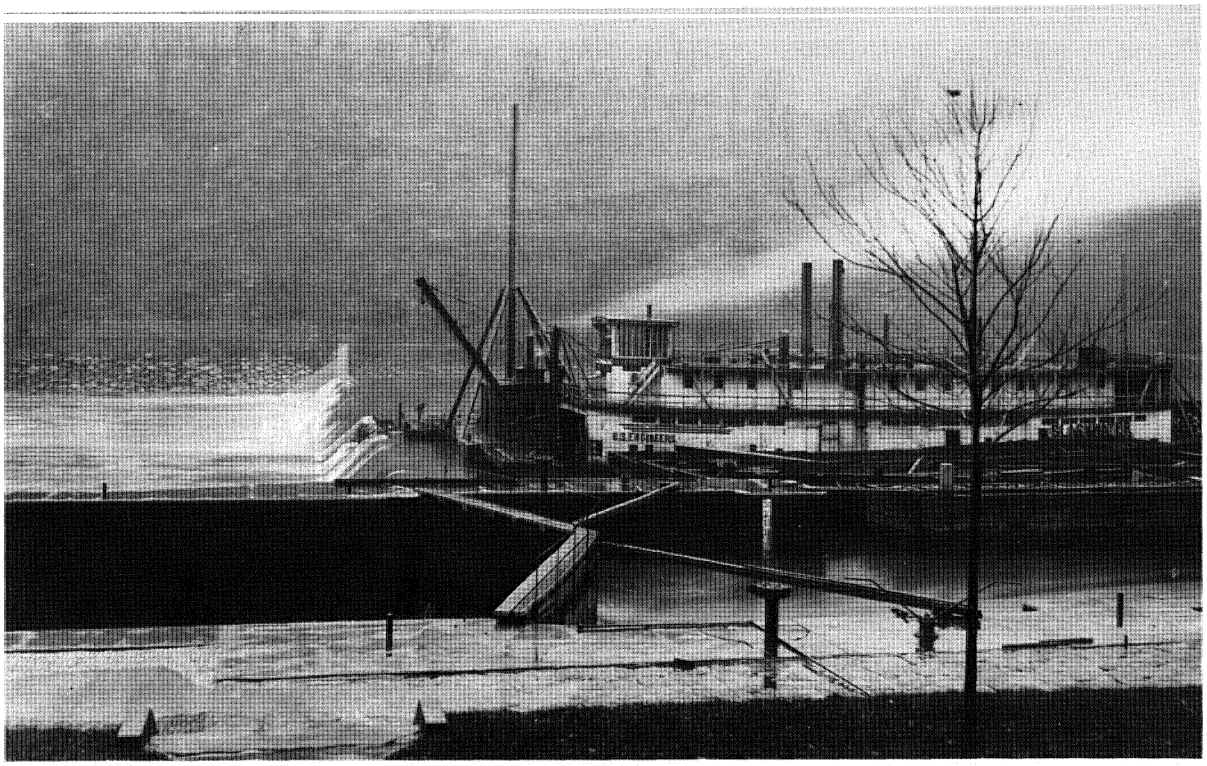
When swearing subsided, the lockmaster asked both pilots to back the boats off. Neither would budge. He threatened them with every regulation in the book, and the answer was still no. Both were first at the lock. Finally he returned to the lockhouse and called the company superintendents and at last arranged orders for Williams to back the *Woodward* out of the lock entrance and let Ganoe take the *Elizabeth* through first. Damage was not serious, acrimony faded, and the two pilots later became friends and business partners.

Actual jamming of a lock was rare, but quarrels over precedence were common. There was the time Abram F. McGowan at Lock 4 became puzzled about a beer boat that had a passenger license. Passengers packets were locked before towboats. McGowan told the District Engineer, however, that the beer boat steamed up and down the Monongahela, landing at any place to deliver kegs of beer, but took no passengers because the captain thought them a bother. The District Engineer surmised that the beer boat had obtained a passenger license merely to avoid lockage delays, and he ruled it should not have precedence over towboats. Beer delivery on the Monongahela slowed.

Experienced employees of the Monongahela Navigation Company remained on the job after the river was freed in 1897, and they served the Pittsburgh District well. Somehow, the name of the last navigation company employee to retire from the service seemed appropriate: Joseph Allfree began his service as a waterboy for the navigation company in 1892, spent many years as assistant lockmaster at Lock 4, and retired from the Pittsburgh District in 1940.

Experienced, capable, and dedicated lockmen were vital on the Monongahela, where for many years traffic was heavier than on any other stream in America and where difficult and hazardous situations often occurred. In 1909, for instance, the pilot of the *Stella Moren* lost control of his tow in the upper approach to Lock 2 at Braddock and the tow began to swing downstream, pivoting across the upper end of the lock guard wall. Lockmen tossed lines to the steamer and one jumped onto the boat, offering to cut it loose from the tow to save it. The pilot would not permit it, the mooring ropes snapped, and both boat and barges went broadside over the dam and wrecked.

In addition to employees, the Pittsburgh District inherited from the navigation company the repair steamer *Slackwater*, a few derrick and pump boats, and a repair shop near Charleroi at Lock 4. The Lock 4 repair station was comprised of a machine shop and forge that turned out metal parts for boats and locks, a saw and planing mill that produced lumber



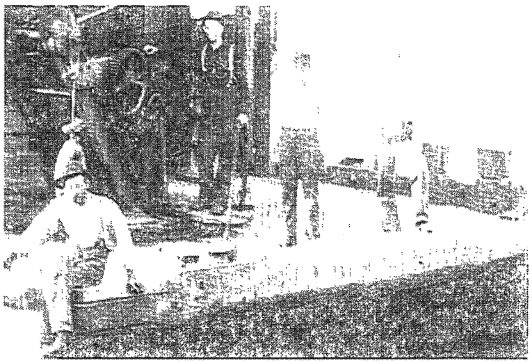
for lockgates, boats, and flashboards, and a boatyard for the building and repairing of floating plant. In 1905, alone, the boatyard built 7 lock-service flats, 6 stone scows, 2 concrete mixer flats, a piledriver boat, a derrickboat, and 3 new lockgates.

The Engineers constantly sought methods to mechanize lock operations and speed traffic. Monongahela lockgates had first been opened and closed by chains winding on handpowered capstans. In 1876, Superintendent George W. Lutes at Lock 3 installed a waterwheel in the current passing over the dam and applied its power to lockgate operation and to the haulage of tows in and out of the chamber through a system of drums, shafting, clutches, and gearing patented by lockman Tom Pollard. The system opened a lockgate in thirty seconds, an eighth of the time the job took by hand, saving labor and speeding lockage. It was also installed at Locks 1, 2, and 4. The system allowed lockmen at No. 1 to handle 58 boats and barges transporting 63,118 tons of coal in twenty-four hours on December 17, 1881, and do it despite a four hour suspension of lockage while boat pilots argued about precedence.

After 1897, Pittsburgh District installed small steam plants at some locks to power the operating system, and about 1920 William D. Fairchild, successor to Thomas Roberts as Monongahela Principal Engineer, placed a water turbine in Dam 5 to generate electric power for operations; turbines were also installed at Dams 7 and 8 in 1924. Though steam packet service was drawing to a close on the Monongahela by 1920, growth of coal commerce continued and mechanized lock operations were sorely needed.

The elaborate passenger packet *Columbia,* with 75 staterooms, burned in 1910; the *Valley Gem,* last packet in the Fairmont trade, was cut down by ice in 1918; and the *Leroy,* last packet on the run to Morgantown, left the Monongahela in 1921. Passenger packet service ended in the early 20th century and inland river commerce in general dwindled toward its lowest ebb about 1920; but Monongahela coal shipments continued to increase, climbing to 21.8 million tons in 1924 and winning the sobriquet "Little Giant" for the Monongahela because its tonnage was greater than that of any other inland stream and larger than tonnage handled through the Panama Canal. Monongahela traffic moved at an estimated annual savings of $14 million, though the federal government had invested a total of less than $11 million in the Monongahela project prior to 1924.

On to Cairo Because it was a growing industrial center and because West Virginia had no District Engineer office, Major William H. Bixby recommended Wheeling in 1900 as the location of a new District office to have responsibility for construction of Ohio River locks and dams. Bixby explained: "Major Powell at the Pittsburgh office is already overloaded with work; Captain Hodges at the Second Cincinnati office has already about all that one officer can properly attend to; and I, at the other Cincinnati office, have my time so occupied with the general work of the Ohio River, surveys, snagging, dikes, low dams, channel dredging, special dredging, ice piers, harbor lines, special permits, etc., that I cannot give to the movable dam construction the personal attention that it ought to have."



Slackwater crew

Opposite Page:
Repair steamer *Slackwater* put to work - Dam 11, Monongahela River

Persuaded by Major Bixby's argument, the Chief of Engineers sent Captain William E. Craighill, son of the officer who directed the fortification of Pittsburgh in 1863, to Wheeling on November 16, 1901, to open a District office at 500 South Broadway. But Pittsburgh rivermen were not at all pleased with supervision of the Ohio River dams by an Engineer officer and staff at rival Wheeling.

Captain Craighill agreed with the rivermen about Davis Island Dam; it was properly part of Pittsburgh harbor, and on January 20, 1902, he transferred it to Major Sibert at the Pittsburgh District. The Davis Island transfer did not satisfy Pittsburgh rivermen, however, and they took their complaint to Senator Matthew S. Quay of Beaver, Pennsylvania. Senator Quay accused Captain Craighill of firing Pennsylvanians from the Ohio River project, replacing them with West Virginians, and asked the Chief of Engineers to investigate. "These men are my neighbors," Quay told the Chief, "and I had part in getting legislation for Davis Island Dam through the Pennsylvania legislature and procured legislation for dams 2-6. I take a personal interest in this project."

The Chief told the Senator the charges were groundless, that Craighill had laid off fourteen men at Davis Island Dam because William Martin at the Davis Island office was no longer directing construction of the locks and dams below No. 1. The explanation satisfied neither Quay, nor the Pittsburgh Coal Exchange and Chamber of Commerce, and in September 1902 they asked President Theodore Roosevelt to transfer the Ohio River slackwater project back to the Pittsburgh District. The President told the Secretary of War he wanted Senator Quay's request honored "if it is a possible thing."

The Chief of Engineers opposed the transfer, explaining that the Ohio River locks and dams had been supervised by the Cincinnati District, never the Pittsburgh District, and it was therefore impossible to transfer anything *back* to Pittsburgh. Pittsburgh interests, seconded by Senator Quay and Senator Boies Penrose, continued their political pressures, however, and President Roosevelt, who apparently never fully understood the situation, issued an order on February 25, 1903: "The President directs that the Pennsylvania dams on the Ohio River be put under the control of the new Pittsburgh office."

Captain Craighill at Wheeling protested that if Engineer Districts were to be organized along state boundaries then the upper Monongahela project logically belonged to his District, but to no avail. Ohio River Locks and Dams 2 to 7, those located upstream of the Pennsylvania state line, were transferred on February 29, 1903, from the Wheeling to the Pittsburgh District, from Captain Craighill to Major Sibert.

Thus, "Goliath" Sibert, already involved in reconstruction of the old navigation company project on the lower Monongahela, construction of six new locks and dams on the upper Monongahela, and the bitter Allegheny River bridge dispute, had the locks and dams on the upper Ohio more or less thrust upon him. And he did not like what he saw on the Ohio, where locks and dams for six-foot slackwater were being built for the benefit of barge tows that normally drew more than eight feet of water.

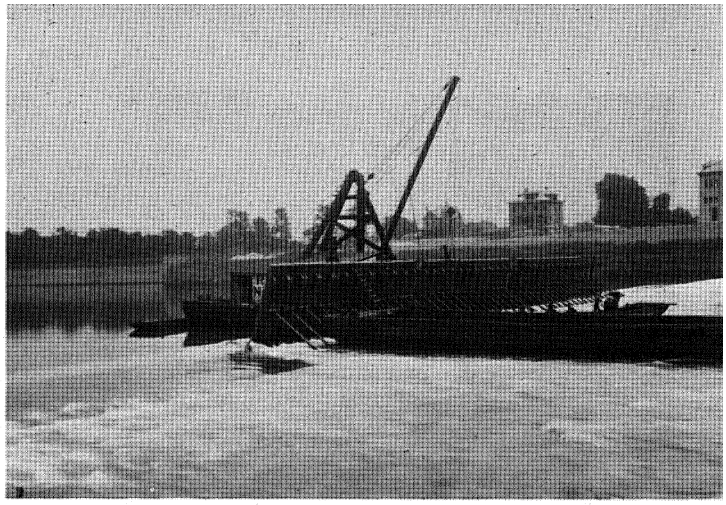
The Nine-Foot Project "Have you ever been down the Ohio?" Sibert asked young Lieutenant George R. Spalding when he reported in 1903 to the Pittsburgh office.

"No, sir," Spalding replied.

"Ever been assigned to dam construction? Know anything about dams?"

"No, sir."

"Goliath" Sibert picked the lieutenant's records from the desk, leaned back in his swivel chair, thumbed through the papers a few moments, noted Spalding had just returned from combat engineering in the Philippines, and was satisfied. "Spalding," he said, "you have a good record and I'm



Dam 5, Ohio River, constructed 1898-1907

going to put you in charge of construction of Dam 3 on the Ohio. You will have some fine assistants who know their business and will handle the details, but I don't want you to finish the dam."

Spalding's eyes widened with surprise. "Don't finish the dam?" he asked.

"That's right," Sibert replied. "You finish the lock and the dam foundation, but not the wickets. I think Congress will soon approve nine-foot instead of six-foot pools and it would make us look silly to build dams for six-foot navigation, then turn right around and tear them out to install wickets for nine-foot slackwater."

Sibert explained that Congress had approved construction of Merrill Dam, Lock and Dam 6 below the mouth of the Beaver, in 1890 and construction of Nos. 2-5 in 1896, but funding had been meager and none of the dams below Davis Island were finished. He recalled that when he arrived in Pittsburgh Thomas Roberts and Captain William Rodgers told him that rivermen wanted nine-foot instead of six-foot pools for navigation on the Ohio because it would allow loading barges to an 8.5-foot draft instead of 5.5 feet and would improve the speed and maneuverability of tows, saving millions of dollars every year. He reminded Spalding that Congress had approved a nine-foot depth for the lower Mississippi and had approved construction of the Panama Canal, that the Pittsburgh to New Orleans water route was, as it had been always, the artery most heavily used by inland river commerce. "If a similar nine-foot depth were made in the Ohio, from Pittsburgh to Cairo," Sibert reasoned, "by the time the Isthmian Canal is completed, Pittsburgh will be in a position to place her products at tidewater at a cost that would enable her products to compete favorably in the world's markets."

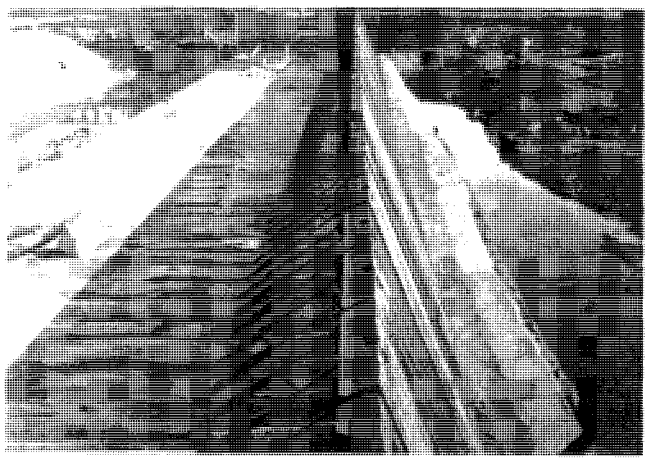
When Lieutenant Spalding fully understood the situation and his duties, he left Sibert's office and headed down the Ohio to build, but not to finish, Lock and Dam 3.

At the time Sibert interviewed young Spalding, he and Captain Craighill of Wheeling District and Colonel G. J. Lydecker of Central Division were studying changing the six-foot to a nine-foot project. Congress had authorized the study in 1902, thanks to the work of Captain William Rodgers and Senator Matthew Quay. The three officers thought it clear that the Ohio River above Lock 6 was destined to be lined on both banks by industrial plants that would ship iron, steel, and other products downriver to the tidewater and international markets. They calculated that savings on shipments from Pittsburgh to New Orleans would be 32.5¢ greater per ton on a nine-foot than on a six-foot project, and they estimated that, with a nine-foot depth available on the Ohio and Mississippi and the Panama Canal completed, Ohio River tonnage would climb to 10 million tons a year, transported at an annual savings of more than $3 million. "The greater the draft," the Engineers concluded, "the cheaper the transportation by water."

On the basis of the Sibert report, Congress in 1905 approved increasing the depths of the pools behind Locks and Dams 1 to 6 to nine feet, through use of longer wickets and a few structural modifications. Major Sibert then gave Lieutenant Spalding and his other assistants on the Ohio River project the green light. They finished Locks and Dams 2 through 6 in short order; but Congress still had qualms about approving nine-foot slackwater for the entire Ohio River. It might take as many as 54 locks and dams and would be extremely costly.

"I have never participated in anything like it," said Senator Joseph Ransdell of his trip with other members of Congress down the Ohio by steamboat in May 1905. "All the great cities on the river entertained us royally, and the smaller cities, too. As our palatial steamer landed, bands of music met us with beautiful airs, thousands of children waving flags and singing patriotic songs met us and every whistle and every bell in the community sought to bid us welcome. On every flag we saw were these words: NINE FEET FROM PITTSBURGH TO CAIRO.

Dam 4, Ohio River, constructed 1898-1908



The very birds in the valley sang Nine feet from Pittsburgh to Cairo. The winds whistled it, the waters of the river gurgled it."

"By the time we reached Cincinnati," Ransdell recalled, "we had become firmly convinced of the merits of the project, but the trouble was how to do it. Every Rivers and Harbors bill that I had ever heard about was accompanied by a universal cry of pork barrel and was looked upon as utterly unworthy of consideration and when one was passed, the friends of waterways were almost obliged to hang their heads in shame that they were participating; digging down in the treasury and stealing a lot of money. Vicious legislation--that was the idea."

At Cincinnati in 1905, Ransdell and his friends organized the National Rivers and Harbors Congress, with nationwide membership to support worthwhile waterway projects, and in Congress that year they won appointment of the Lockwood Board, chaired by Daniel W. Lockwood, a former assistant to "Padre" Merrill, to study the Pittsburgh to Cairo project. The Lockwood Board reported in 1906 that nine-foot slackwater would cost $13 million more than six-foot slackwater to build, but transportation savings would be substantially greater. The trouble with the report was that Ohio River commerce in 1906 seemed stagnant at 9 million tons and estimated savings would only be realized if commerce increased.

The Board of Engineers for Rivers and Harbors (BERH), established in 1902 to eliminate pork barrel projects from consideration, thought the Lockwood Board's prediction that slackwater would stimulate increased waterways tonnage a viable concept and stamped its approval on the nine-foot project, but the Chief of Engineers did not concur. He sent the Lockwood report on to Congress with the note that it was based on "conjectural future commerce rather than upon the commerce now existing or plainly in sight," and saying that he preferred to leave the decision on the matter to the wisdom of Congress.

Railroad officials described the proposed nine-foot project on the Ohio as foolish and preposterous. Railroads, they argued, will force packets from the rivers, eventually undersell coal transport by river, and end the barge towing business. John H. Peyton, transportation economist for the Louisville and Nashville Railroad, called the predictions of the Lockwood Board "astonishing," and declared that the locks and dams on the Ohio would, in the end, become mere "monuments to the folly of men."

"It seems to me," said President William Howard Taft in 1910, "that in the development of our inland waterways it would be wise to begin with this particular project and carry it through as rapidly as may be." With support from the Taft administration, Congress approved nine-foot slackwater from Pittsburgh to Cairo through construction of up to 54 locks and dams in 1910, and it promised to supply funds sufficient to finish the job by 1922.

Many people still doubted the job could be done, or that it would pay to do it. Even editors of the *Engineering News*, an influential trade journal, questioned the value of the project. "Unless the rivers can be made to carry a *very large volume of traffic*," they wrote, "the investment necessary to build dams and locks all along them is bound to be a losing one." The Ohio River was clearly thought a test case. If Major Sibert and the Lockwood Board were wrong, if the project were not successfully built and operated, if major waterborne commerce did not develop, the future of all waterway projects would be in jeopardy.