

BIBLIOGRAPHICAL ESSAY

The principal sources for the history of the Pittsburgh Engineer District and the Corps of Engineers in general are the Records of the Office of the Chief of Engineers, Records Group 77, National Archives (cited hereinafter as RG 77, NA), and the annual reports of the Chief of Engineers. The Records of the Office of the Chief of Engineers (RG 77, NA) prior to 1917 are located in the Old Military Records Branch, National Archives, Washington, D. C. Records for the years since 1917 are located at Washington National Records Center of the National Archives at Suitland, Maryland, and in several Regional Federal Records Centers, especially the centers at Philadelphia, Pennsylvania, and Kansas City, Missouri. The annual reports of the Chief of Engineers prior to 1837 are printed in the *American State Papers: Military Affairs* (7 vols.; Washington, 1834-1860). From 1837 to 1867, the annual reports were printed in congressional documents, usually accompanying the annual message of the President to Congress. Since 1867, the annual reports have been printed separately in a serial set commonly known as the *Annual Report of the Chief of Engineers* (cited hereinafter as *ARCE*, followed by the year of the report). Each annual report is multivolume, but pagination is usually consecutive.

Most divisions and branches of the Pittsburgh District office in the Federal Building, 1000 Liberty Avenue, Pittsburgh, maintain limited records, which are eventually retired to the National Archives. Those of special historical interest are located in the Engineering Division, Public Affairs Office, and the District Library.

Older general histories of the Corps of Engineers, which furnish a framework for the history of the Pittsburgh Engineer District, are W. Stull Holt, *The Office of the Chief of Engineers of the Army: Its Non-Military History, Activities, and Organization* (Baltimore, 1923); Henry P. Beers, "A History of the U. S. Topographical Engineers, 1813-1863," *Military Engineer*, XXXIV (June-July, 1942), 287-91, 348-52; Edward Burr, "Historical Sketch of the

Corps of Engineers, U. S. Army," *Occasional Papers: The Engineer School* (No. 71, 1939); William P. Craighill, "Corps of Engineers, United States Army," *Transactions of the American Society of Civil Engineers*, VIII (1897), 429-35; Henry C. Jewett, "History of the Corps of Engineers to 1915," *Military Engineer*, XIV (September-December, 1922), 304-06, 385-88; and Andrew A. Humphreys, "Historical Sketch of the Corps of Engineers," in U. S., Congress, House, *Reorganization of the Army*, H. Rept. 555, 45 Congress, 3 Session, 1878, pp. 327-49.

Space limitations prevent the listing of all sources, but principal sources are outlined hereinafter for those who might wish to pursue a specific subject mentioned in the text at greater length. Organization is by chapter and thereunder follows the subject matter order of the text.

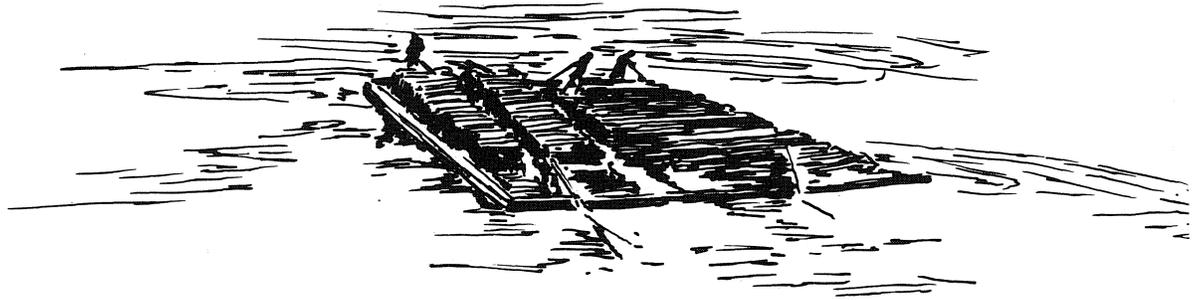
Chapter 1

ENGINEERS AT THE HEADWATERS

Ralph B. Buzzaird, "America's First Chief Engineer," *Military Engineer*, XXIX (December, 1947), 505-10, reviews the career of General Richard Gridley.

General accounts of the action at the Forks of the Ohio, which include discussions of the roles of Francois Le Mercier and George Washington, are Charles M. Stotz, *Point of Empire: Conflict at the Forks of the Ohio* (Pittsburgh, 1970); Charles M. Stotz and Alfred P. James, *Drums in the Forest* (Pittsburgh, 1958); and Walter O'Meara, *Guns at the Forks* (Englewood Cliffs, New Jersey, 1965).

Activities of French Engineers in America are described in John F. McDermott, ed., *The French in the Mississippi Valley* (Urbana, 1965). The French forts in Pennsylvania are described in William A. Hunter, *Forts on the Pennsylvania Frontier, 1753-1758* (Harrisburg, 1960). Correspondence pertaining to the 1739 Longueuil expedition is printed in Sylvester K. Stevens and Donald H. Kent, eds., *Wilderness Chronicles of Northwestern Pennsylvania* (Harrisburg, 1941).



Documents relating to the activities of George Washington in the Ohio River basin are printed in Hugh Cleland, *George Washington in the Ohio Valley* (Pittsburgh, 1955).

Harry Gordon's account of Braddock's Defeat is quoted from Charles M. Stotz, ed., "A Letter from Will's Creek," *Western Pennsylvania Historical Magazine*, XLIV (June, 1961), 129-37. Washington's 1758 report on the capture of Fort Duquesne is quoted in Charles W. Dahlinger, "Fort Pitt," *Western Pennsylvania Historical Magazine*, V (January, 1922), 8. Charles M. Stotz, "Defense in the Wilderness," *Western Pennsylvania Historical Magazine*, XLI (Autumn, 1958), 59-203, furnishes authoritative details about the construction of Fort Pitt.

The Thomas Hutchins Papers are in the Historical Society of Pennsylvania, Philadelphia. His career is outlined in Anna M. Quattrochi's articles: "Thomas Hutchins in Western Pennsylvania," *Pennsylvania History*, XVI (January, 1949), 31-38, and "Thomas Hutchins, Provincial Soldier and Indian Agent in the Ohio Valley, 1758-1761," *Western Pennsylvania Historical Magazine*, XLV (September, 1962), 193-207.

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Chartes in the Illinois Country, March-April, 1766, *Pennsylvania Magazine of History and Biography*, XXXI (1907), 145-56, and "Diary of Matthev Clarkson, West of the Alleghanies, in 1766," in Henry R. Schoolcraft, *History, Condition and Prospects of the Indian Tribes of the Unites States* Part IV (Philadelphia, 1856), 265-77.

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Chapter 2

THE GATEWAY TO THE WEST

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The authoritative work on keelboats is Leland D. Baldwin, *The Keelboat Age on Western Waters* (Pittsburgh, 1941).

General Anthony Wayne's experiences at Pittsburgh and with Ohio River navigation are best traced in his papers at the Historical Society of Pennsylvania, Philadelphia. Part of that correspondence is printed in Richard C. Knopf, ed., *Anthony Wayne: A Name in Arms* (Pittsburgh, 1960). See also Harry E. Wildes, *Anthony Wayne: Trouble Shooter of the American Revolution* (New

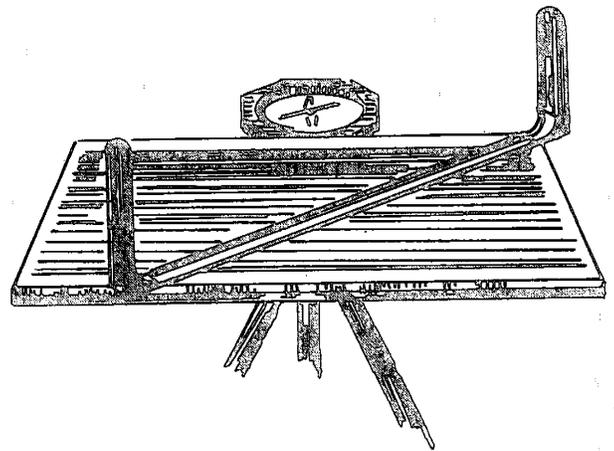
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On General James Wilkinson and the galleys, see Thomas R. Hay and M. R. Werner, *The Admirable Trumpeter: A Biography of General James Wilkinson* (New York, 1941); "General James Wilkinson's Order Book, 1796-1808," Record Group 94, National Archives; Bob Stearns, "Pittsburgh's Fighting Ships," *Pittsburgh Press*, May 2, 1976; William F. Trimble, "From Sail to Steam," *Western Pennsylvania Historical Magazine*, LII (April, 1975) 147-67; Isaac Craig Papers, Carnegie Library Pittsburgh; and James Wilkinson, *Memoirs of My Own Times* (Philadelphia, 1816).

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see especially Secretary of Navy, "Miscellaneous Letters Received, 1801-84," Microfilm 124. On Aaron Burr and his visit to Canonsburg, see Mark Van Doren, ed., *Correspondence of Aaron Burr and His Daughter Theodosia* (New York, 1929); Max Savelle, *George Morgan, Colony Builder* (New York, 1932); and testimony at the Burr trial, printed in *American State Papers: Miscellaneous*, I, 556.

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On the Lewis and Clark expedition, see James C. King, "Pittsburgh: Gateway to the Far West in 1803," *Western Pennsylvania Historical Magazine*, L (October, 1967), 301-03; Milo M. Quaife, ed., "The Journals of Captain Meriwether Lewis and Sergeant John Ordway Kept on the Expedition of Western Exploration, 1803-1806," *Wisconsin Historical Society Collections*, XXII (1916), 31-402; John Bakeless, *Lewis and Clark, Partners in Discovery* (New York, 1947); and Donald B. Chidsey, *Lewis and Clark: the Great Adventure* (New York, 1970).

Chapter 3

REDUCING THE RISKS OF NAVIGATION

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The "Journal of Col. John May, of Boston, 1789," *Pennsylvania Magazine of History and Biography*, XLV (1921), 101-79, describes troubles with

Monongahela navigation. Timothy Flint, *Recollections of the Last Ten Years* (Boston, 1826), pp. 19-21, described his flatboat trip to Deadman's Ripple. Flatboat losses are estimated in Leland D. Baldwin, *The Keelboat Age on the Western Waters* (Pittsburgh, 1941), pp. 83-84.

Governor Thomas Mifflin's message on waterway projects is printed in *Pennsylvania Archives*, Fourth Series, IV, 152. Contracts, correspondence, and other materials pertaining to the Pennsylvania river improvement projects are located in River Improvement Papers, Record Group 26, Pennsylvania State Archives, Harrisburg, Pennsylvania. The Matlack, Maclay, and Adlum report of 1790 is printed in *Pennsylvania, House Journal*, 1815-1816, Appendix, pp. 28-41. See also Samuel Maclay, *Journal of Samuel Maclay while Surveying the West Branch of the Susquehanna, the Sinnemahoning, and the Allegheny Rivers in 1790* (Williamsport, 1887), and Donald Kent and Merle Deardorff, "John Adlum on the Allegheny: Memoirs for the Year 1794," *Pennsylvania Magazine of History and Biography*, LXXXIV (July, October, 1960), 265-324, 434-80.

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For Marcus Hulings and keelboating on French Creek, see Serepta Kussart, *The Allegheny River* (Pittsburgh, 1938). Henry Bouquet's improvements to French Creek navigation are mentioned in *Michigan Pioneer and Historical Collections*, XIX (Lansing, 1911), 39, 52, 74. Kussart, *The Allegheny*

River, is authoritative on French Creek navigation history; Pennsylvania improvements of the stream must be traced in River Improvement Papers, Record Group 26, and Internal Improvements File, Record Group 2, Pennsylvania State Archives, Harrisburg. The same collections contain information on the Monongahela and Youghiogheny projects, for which see also correspondence between Albert Gallatin and John Badollet in "The Papers of Albert Gallatin" (New York Historical Society microfilm), and Joshua Gilpin, "Journal of a Tour from Philadelphia thru the Western Counties of Pennsylvania," *Pennsylvania Magazine of History and Biography*, LI (1927), 185-87.

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Chapter 4

STEAMBOATS AND THE WESTERN ENGINEERS

Robert Buchanan's memories of the *New Orleans* are quoted in Frederick B. Read, *Up the Heights of Fame and Fortune* (Cincinnati, 1873), p. 65. Other information about the 1811 voyage is found in John H. B. Latrobe, *The First Steamboat Voyage on the Western Waters* (Baltimore, 1871); F. Van Loon

Ryder, "The New Orleans, the First Steamboat on Our Western Waters," *Filson Club History Quarterly*, XXXVII (January, 1963), 29-37; and many other sources.

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116-18; Roger L. Nichols, "Army Contributions to River Transportation, 1818-1825," *Military Affairs*, XXXIII (April, 1969), 242-49; Stephen H. Long, "Report of the Western River Expedition, February 20, 1821," RG 77, NA; Richard G. Wood, *Stephen Harriman Long, 1784-1864: Army Engineer, Explorer, Inventor* (Glendale, Calif., 1966). See also the correspondence between Long and John Calhoun in W. Edwin Hemphill, ed., *The Papers of John C. Calhoun*, IV (Columbia, 1969), 31, 74, 118.

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Chapter 5

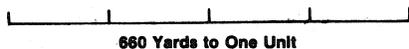
THE THIRTY INCH PROJECT

Benjamin A. Botkin, ed., *A Treasury of Mississippi River Folklore* (New York, 1955), pp. 93-95, relates the story of Shreve and the *Heliopolis*. The reports of Shreve on his operations and the reports of inspecting engineer officers are printed in *American State Papers: Military Affairs*, Vols. IV, V, VI, VII. See also Florence Dorsey, *Master of the Mississippi* (Boston, 1941), and U. S., Congress, House, *Henry M. Shreve-Snag Boat*, H. Rept. 272, 27 Congress, 2 Sess., 1843.

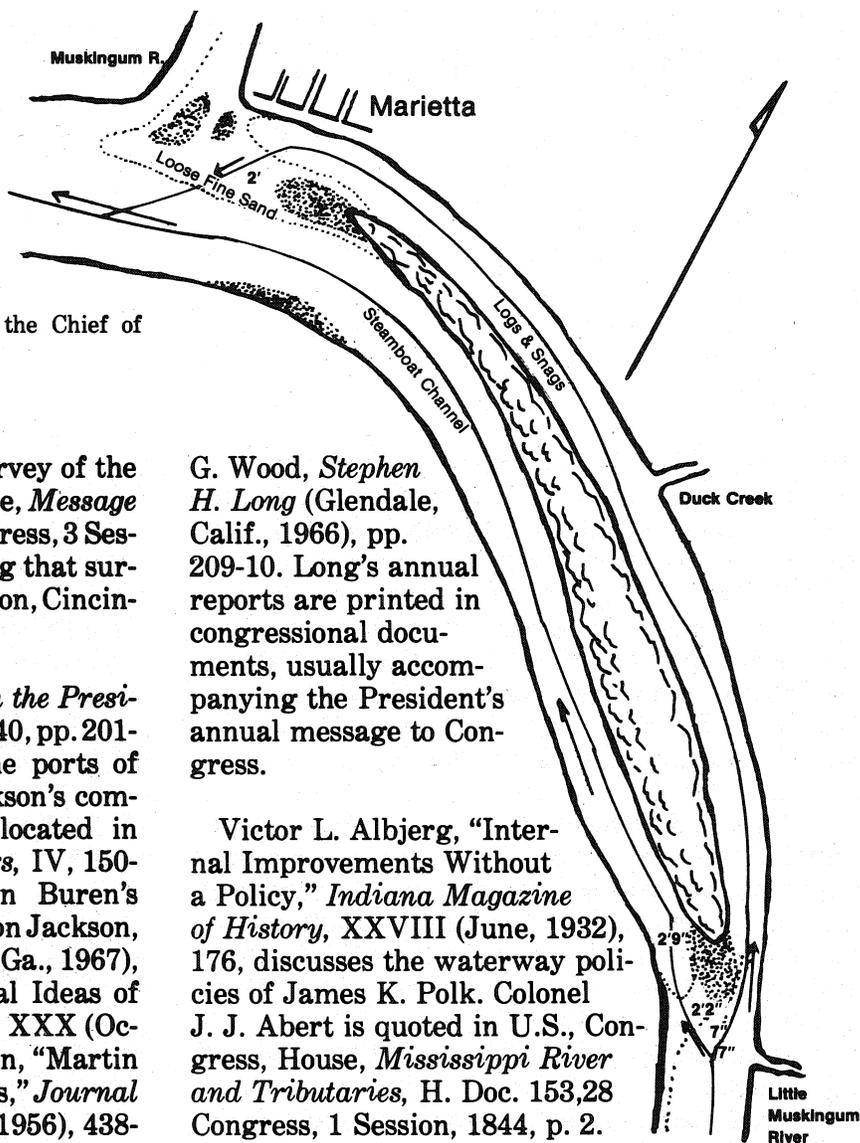
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MARIETTA ISLAND
A Configuration from Report of 1819



(Copied from report of Lt. George Dutton to the Chief of Engineers, Oct. 26, 1835)



Details of the Sanders-Fuller 1838 survey of the Ohio are found in U. S., Congress, House, *Message from the President*, H. Ex. Doc. 2, 25 Congress, 3 Session, 1838, p. 319. The maps made during that survey are still available at Ohio River Division, Cincinnati, Ohio.

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G. Wood, *Stephen H. Long* (Glendale, Calif., 1966), pp. 209-10. Long's annual reports are printed in congressional documents, usually accompanying the President's annual message to Congress.

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Sanders' views on the military values of improved waterways are printed in U. S., Congress, Senate, *Message from the President*, S. Doc. 1, 28 Congress, 1 Session, 1843, p. 223. The steamers built by Colonel Long during the Mexican War are listed in *S&D Reflector*, IV (December, 1966), pp. 22-23. See also Morton E. Steans, "Pittsburgh in the Mexican War," *Western Pennsylvania Historical Magazine*, VII (October, 1924), 235-44.

Millard Fillmore is quoted from U. S., Congress, Senate, *Message from the President*, S. Ex. Doc. 1, 31 Congress, 2 Session, 1850, pp. 14-15. See also U. S., Congress, House, *Memorial from a Meeting of Citizens of the West*, H. Misc. Doc. 3, 31 Congress, 2 Session, 1850.

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Congress, 1 Session, 1856, pp. 287-98. Roy Nichols, *Franklin Pierce: Young Hickory of the Granite Hills* (Philadelphia, 1958), pp. 354-55, 374-75, comments on Pierce's waterways policy. On James B. Eads, see "Western River Improvement and Wrecking Company," *River Drift* (St. Louis, 1969).

Chapter 6

ALLEGHENY, MONONGAHELA, AND YOUGHIOGHENY

The Cornplanter and *Allegheny* story is located in Neville Craig, *The Olden Time*, I (January, 1846), 41-44. See also Henry K. Siebeneck, "Cornplanter," *Western Pennsylvania Historical Magazine*, XI (July, 1928), 180-93; and Serepta Kussart, "The Centennial of a Steamboat," *National Waterways*, VIII (June, 1930), 22-24, 62.

For all aspects of Allegheny River traffic, consult Serepta Kussart, *The Allegheny River* (Pittsburgh, 1938), and Frederick Way, *The Allegheny* (New York, 1942). Also useful are Harold C. Putnam, *Improvement of the Allegheny River and Flood Control* (Warren, 1944), and E. L. Babbitt, *The Allegheny Pilot* (Freeport, 1855).

Two interesting journals of Allegheny raftsmen are Ernest C. Miller, ed., "Down the Rivers: A Rafting Journal of 1859 from Warren, Pa., to Louisville, Ky.," *Western Pennsylvania Historical Magazine*, XL (Fall, 1957), 149-62; and Frances Baxter, ed., "Rafting on the Allegheny and Ohio, 1844," *Pennsylvania Magazine of History and Biography*, LI (1927), 27-78, 143-71, 207-43. Two accounts of flat-boating from Jamestown down the Allegheny are "Arthur Johnston, His Book," *Western Pennsylvania Historical Magazine*, XXVI (September-December, 1943), 151-58, and Arthur W. Anderson, "Nathan Brown and his Yankee Notions," *New York History*, XVI (April, 1935), 178-88.

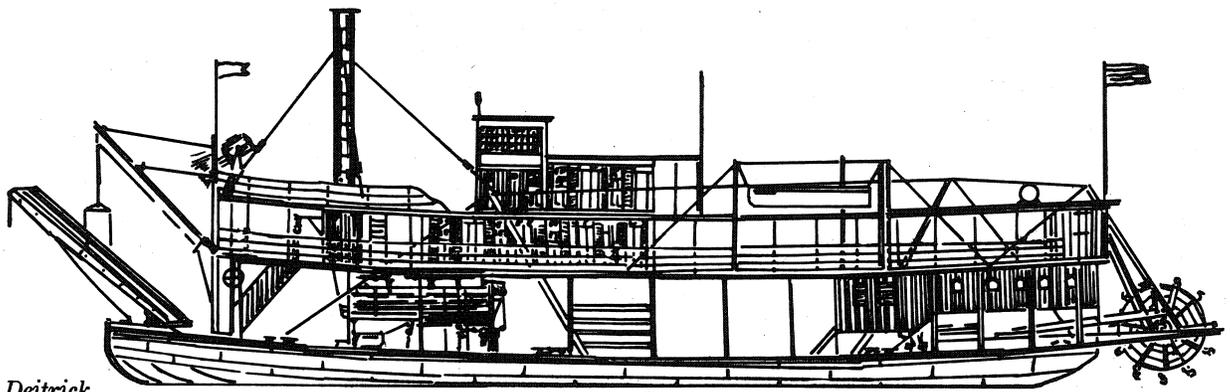
Joseph Totten's survey report on the Allegheny is located in "Letters and Reports of Col. Joseph G.

Totten," (Vol. 1, 432-36), RG 77, NA; see also U. S., Congress, House, *Chesapeake and Ohio Canal--Extension of*, H. Rept. 216, 19 Congress, 1 Session, 1826. The Geddes survey is printed in Pennsylvania, *Second Report of the Canal Commission*, No. 3, p. 48, and the Gay survey in *Hazards Register of Pennsylvania*, III (March 14, 1829), 166-70. The survey by James Kearney is U. S., Congress, House, *Survey of Allegany River*, H. Doc. 343, 25 Congress, 2 Session, 1838. See also, U. S., House, Committee on Roads and Canals, *Survey--Canal Route--Olean Point to Erie Canal*, H. Rept. 151, 19 Congress, 1 Session, 1826.

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The Hughes 1837 survey is printed in U. S., Congress, House, *Survey of Allegany River*, H. Doc. 343, 25 Congress, 2 Session, 1838. See also, U. S., Congress, House, *Memorial for Improvement of Allegany River from Pittsburgh to Olean*, H. Doc. 84, 24 Congress, 2 Session, 1837.

A virtually complete collection of materials pertaining to Monongahela River navigation is located



Steamer *Jas. Deitrick*
 From the James Rees & Son Company, Pittsburgh catalog

in Serepta Kussart, "Navigation on the Monongahela" (bound volumes of newspaper clippings, Carnegie Library, Pittsburgh). Richard T. Wiley, *The Monongahela* (Butler, 1937) is also useful.

The 1814 Monongahela survey is printed in Pennsylvania, *House Journal*, 1815-1816, pp. 59-60. Papers of the commissioners who improved the Monongahela in 1822 are located in Record Group 26, Internal Improvements File, and Record Group 2, River Improvement Accounts, Pennsylvania State Archives, Harrisburg. Edward Gay's survey of the Monongahela is printed in *Hazards Register of Pennsylvania*, III (March 21, 1829), 181-84. The 1832 Howard survey is printed in U. S., Congress, House, *Navigation of the Monongahela River*, H. Doc. 351, 23 Congress, 1 Session, 1834, and U. S., Congress, House, Committee on Roads and Canals, *Steamboat Navigation--Monongahela River*, H. Rept. No. 443, 23 Congress, 1 Session, 1834. Maps produced by Dr. Howard now decorate the walls of the Pittsburgh Engineer District. See also, U. S., Congress, House, *Pennsylvania--Brownsville*, H. Doc. 130, 23 Congress, 2 Session, 1835.

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The accounts of Kussart and Wiley of Monongahela navigation supply much material

about the coal shipping business. See also, Frank F. Davis, "Something About the Old Coal Boats of the Ohio," *National Waterways*, VIII (April, 1930), 22, 53. Kussart also provides much information about the Youghiogheny slackwater project. More information is available, however, in W. C. Armstrong, *The Youghiogheny Improvement* (Connellsville, 1908), and in the printed volumes of the *Laws of Pennsylvania*.

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Chapter 7

THE WATERWAYS AND WAR

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The definitive biography of Ellet is Gene D. Lewis, *Charles Ellet, Jr.: The Engineer as Individualist, 1810-1862* (Urbana, 1968). John Sanders' report on the Wheeling Bridge is printed in U. S., Congress, House, Committee on Roads and Canals, *Bridge at Wheeling, Virginia*, H. Rept. 993, 25 Congress, 2 Session, 1838.

The Wheeling Bridge controversy is reviewed in Clifford M. Lewis, "The Wheeling Suspension Bridge," *West Virginia History*, XXXIII (April, 1972), 203-33; Earl Chapin May, *Principio to Wheeling, 1715-1945* (New York, 1945), pp. 155-59; Benjamin P. Thomas and Harold M. Hyman, *Stanton: The Life and Times of Lincoln's Secretary of War* (New York, 1962), pp. 60-63; and Charles H.

Ambler, *A History of Transportation in the Ohio Valley* (Glendale, 1932), pp. 214-30.

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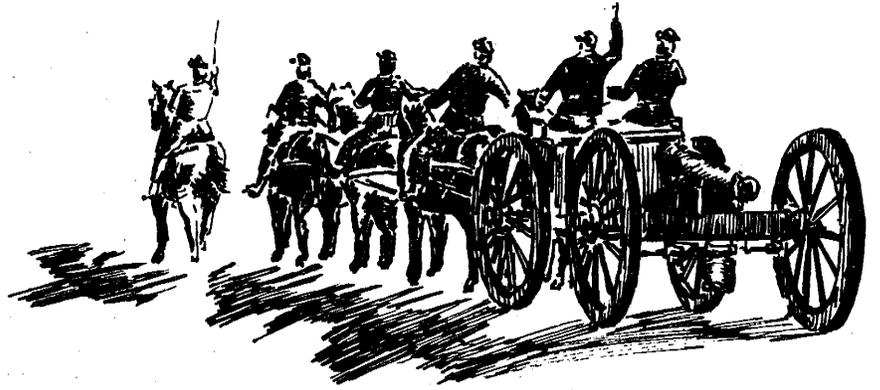
Herman Haupt's plans are reviewed in *Report on the Improvement of the Ohio River Made to the Board of Trade of Pittsburgh* (Pittsburgh, 1864); Josiah Copley, *Letters to the Pittsburgh Board of Trade on the Improvement of the Ohio River* (Pittsburgh, 1856); *An Act to Incorporate the Ohio River Improvement Company* (Philadelphia, 1855); and *ARCE, 1881*, pp. 1926-43.

Milledge L. Bonham, "Morganalia," *Louisiana Historical Quarterly, LVII* (October, 1934), 706-11, relates the story of the burning of New Madrid by James Morgan. Colonel Long's annual report for 1861 is printed in U. S., Congress, Senate, *Message*

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Details of the fortification of Pittsburgh are provided by John P. Cowan, "Fortifying Pittsburgh in 1863," *Western Pennsylvania Historical Magazine*, II (January, 1919), 59-64; Henry K. Siebeneck, "Pittsburgh's Civil War Fortification Claims," *Western Pennsylvania Historical Magazine*, XXVII (March, 1944), 1-19; George Swetnam, "Thirty Days of Panic," *Western Pennsylvania Historical Magazine*, LI (October, 1968), 329-43. Craighill's orders are printed in U. S., War Department, *Official Records of the Union and Confederate Armies*, XXVII, Pt. III, p. 53.

Colonel Parsons' tribute to rivermen who served in the Civil War is printed in U. S., Congress, House, *Message from the President*, H. Ex. Doc. 1, 39 Congress, 1 Session, 1865, pp. 212-16. U. S., Congress, House, *Vessels Bought, Sold, and Chartered by the United States*, H. Ex. Doc. 337, 40 Congress, 2 Session, 1868, is a complete list of steamboats used and sunk in action during the Civil War.

General Richard Delafield's report on resumption of river improvements is U. S., Congress, House, *Harbors on the Sea and Lake Coasts*, H. Ex. Doc. 59, 39 Congress, 1 Session, 1866. The operations of Colonel John N. Macomb at Cincinnati are outlined in *ARCE*, 1867, pp. 376-95; *ARCE*, 1868, pp. 590-94; *ARCE*, 1869, pp. 207-08, 285-91; *ARCE*, 1870, pp. 65-66.

Thomas P. Roberts' diary for 1867 is in the Roberts Papers, in possession of General James Milnor Roberts, Reserve Officers Association, Washington, D. C. The operations of Thomas and Milnor Roberts at the Pittsburgh office, 1866-1870, are outlined in the *Annual Reports of the Chief of Engineers* for those years. See also correspondence in Engineer Department, "Letters Received, 1866-70," RG 77, NA, and U. S., Congress, House, *River and Harbor Improvements*, H. Ex. Doc. 56, 39 Congress, 1 Session, 1867. W. C. Dugan, "Great River Pilots of the Past: Captain George W. Rowley," *National Waterways*, X (May, 1931), 45-46; is a short biography of the captain.

Biographical data is supplied in Margaret E. Merrill, "William E. Merrill," *Professional Memoirs, Corps of Engineers*, IX (November, 1917), pp. 639-42. Merrill's operations at Pittsburgh and Cincinnati offices of the Corps of Engineers are outlined *Annual Reports of the Chief of Engineers*. His correspondence and some of his papers are located in Addison M. Scott Papers, Marshall University Library, Huntington, West Virginia; Records of the Chief of Engineers, RG 77, National Archives; and in the records of the Pittsburgh and Cincinnati Engineer Districts that have been retired to Philadelphia Federal Records Center, RG 77, NA.

Chapter 8

THE UNMENTIONABLE RIVERS

The debate over the appropriation for the Kiskiminetas and Conemaugh rivers is reported in *Congressional Record*, 45 Congress, 2 Session, VII, Pt. 3, pp. 2748-52. Newspaper coverage of the debate was summarized in *Engineering News*, V (May 2, 1878), 138. The Worrall survey is printed in *ARCE*, 1879, pp. 1388-89.

Merrill's reports on the Buckhannon River project are printed in the *Annual Reports of the Chief of Engineers* for the years 1884 to 1892. D. T. Farnsworth's letter is printed in *ARCE*, 1884, pp. 1719-22.

Richard Wiley, *The Monongahela* (Butler, 1937), p. 152, describes the loss of the Warman steamboat on the Cheat River. Serepta Kussart, "Navigation on the Monongahela" (bound clippings, Carnegie Library, Pittsburgh), reports the history of Cheat River navigation. Accounts of the Cheat River project performed by Pennsylvania are located in the Pennsylvania State Archives, Record Group 2, Internal Improvements File, Harrisburg.

Reports on the Army Engineer project on Cheat River are printed in the *Annual Reports of the Chief of Engineers* for the years 1889 to 1895. Subsequent reports are printed in *ARCE*, 1904, pp. 2538-40;

Federal Power Commission, *Third Annual Report* (Washington, 1923), pp. 150-52; and U. S., Congress, House, *Cheat River and Tributaries, West Virginia*, H. Doc. 645, 78 Congress, 2 Session, 1944.

Colonel Merrill's comment on the importance of improvements to logging streams is printed in *ARCE*, 1888, pp. 1796-98. On the "pork barrel," see Edward L. Pross, "A History of Rivers and Harbors Appropriations Bills, 1866-1933," (Ph.D. dissertation, Ohio State University, 1938), and *American Engineer*, IX (February 20, 1885), 85.

Serepta Kussart, "Petroleum Transportation on the Allegheny," *National Waterways*, X (February, 1931), 30-35, 52, describes the Oil Creek freshets. See also Ernest C. Miller and T. K. Stratton, "Oildom's Photographic Historian," *Western Pennsylvania Historical Magazine*, LV (January, 1972), 1-54. For Allegheny oil barging, in addition to Kussart's and Way's standard histories of the Allegheny, see notes in *S&D Reflector*, IX (March, 1972), 23, and XII (June, 1975), 3.

Serepta Kussart, "General White--The Man Who Started Improvement of the Allegheny River," *National Waterways*, IX (November, 1930), 56, 80, furnishes a short biography of Harry White. Engineer surveys of the Allegheny River are printed in the *Annual Reports of the Chief of Engineers* for the years 1876, 1879, and 1880. The history of the open-channel project on the Allegheny River must be traced through the *Annual Reports of the Chief of Engineers* from 1880 to 1915. Correspondence between Merrill and Thomas Roberts, plus other pertinent materials, is stored as "Letters Received, Allegheny River," in Entry 1283, RG 77, NA, at Philadelphia Federal Records Center. The quote from Fred Way comes from his *The Allegheny*, pp. 209-11.

Colonel Merrill's 1871 Monongahela survey is printed in *ARCE*, 1872, pp. 412-19. The history of the construction of Locks and Dams 7, 8, and 9 must be traced through the *Annual Reports of the Chief of Engineers* for the appropriate years. Merrill's cor-

respondence relating to the Monongahela project is "Letters Received, Monongahela River," Entry 1281, RG 77, NA, stored at Philadelphia Federal Records Center.

The opening of the Pittsburgh District Engineer office is mentioned in *ARCE*, 1894, p. 1903; Robert Seedlock, *Genesis of the Pittsburgh Engineer District* (Pittsburgh District, 1938), p. 18; and *Pittsburgh Dispatch*, February 20, 1894.

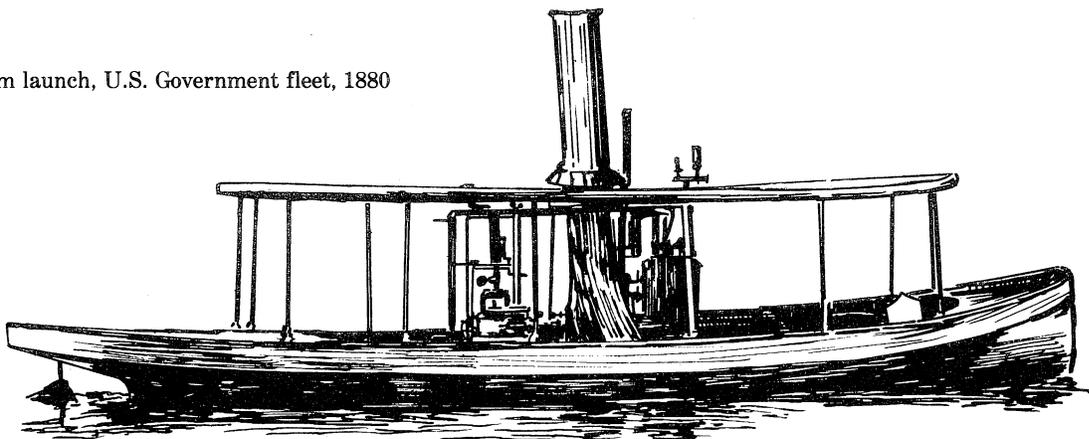
Chapter 9

THE RADICAL PROJECTS

Details of the Davis Island Dam dedication pageant are found in Pittsburgh Chamber of Commerce, *Reports to the Chamber of Commerce upon the Opening of Davis Island Dam* (Pittsburgh, 1886); Frederick Way, "Davis Island Dam Celebration," *S&D Reflector*, III (June, 1966), p. 1; *ARCE*, 1886, pp. 1528-29, 1540-42; and newspaper coverage. See also "Iron Pioneer: Henry W. Oliver," *Greater Pittsburgh*, XXIII (September, 1942), 4-5.

Studies of movable dam designs are outlined in William E. Merrill, *Improvement of Non-Tidal Rivers, Memoirs of S. Janicki, L. Jacquet, A. Pasqueau* (Washington, 1881); William E. Merrill, "Movable Dams," *Engineering News*, V (March 28, 1878), 100-01; *ARCE*, 1874, pp. 415-81; "American Hydraulic Gates," *Journal of the Association of Engineering Societies*, XVI (June, 1896), 189; Felix R. Brunot, "Improvement of the Ohio River," *Journal of the Franklin Institute*, XCVII (May, 1874), 315-17, 327; U. S., Congress, House, *Plans for the Improvement of the Ohio River*, H. Misc. Doc. 33, 46 Congress, 2 Session, 1880; Ellwood Morris, "Description of the Bear Trap Sluice Gates of the Lehigh Descending Navigation," *Journal of the Franklin Institute*, XXXII (December, 1841), 361-68; and *American Engineer*, VII (March 21, 1884), 120.

The economic need for the Ohio River slackwater project is reviewed in Ohio River Commission, *Memorial to Congress* (Cincinnati, 1878); U. S., Con-



gress, Senate, *Report of the Select Committee on Transportation Routes to the Seaboard*, S. Rept. 307, 43 Congress, 1 Session, 1874, pp. 87-90, 218-20, 531-35; and *Pittsburgh Commercial*, May 18, 1875. Merrill, on the value of low-cost grain shipment, is quoted in *Transactions of the American Society of Civil Engineers*, XIV (March, 1885), 103. Howard B. Schonberger, *Transportation to the Seaboard: The "Communication Revolution" and American Foreign Policy, 1860-1900* (Westport, Conn., 1971), is a scholarly analysis of the relationship between federal waterways policy and foreign policy.

James A. Henderson, "Reminiscences of the Rivers," *Western Pennsylvania Historical Magazine*, XII (October, 1929), 235-36, describes the opposition to the Davis Island Dam. See also *ARCE*, 1874, pp. 416-17; *ARCE*, 1876, p. 14; and *ARCE*, 1877, pp. 637-56.

The Pasqueau hurter case is *Alfred Pasqueau v. The United States*, U. S. Court of Claims No. 14765, January 29, 1886. A copy of the brief and related materials is on file in Box NA16, RG 77, NA, Kansas City Federal Records Center.

The *ARCE* for 1878-1886 provides considerable information about the construction of Davis Island Dam. Colonel Merrill's correspondence and records are in Entry 1281, RG 77, NA, Philadelphia Federal Records Center. See also William Martin, "Description of the Cofferdam Used at Davis Island Dam," and James H. Harlow, "Description of a Derrick Used at Davis Island Dam," in *Engineers' Society of Western Pennsylvania Proceedings*, I (1882), 25-28, 275-79. The Goethals story is related in Joseph B. Bishop and Farnham Bishop, *Goethals, Genius of the Panama Canal* (New York, 1930).

The events leading to the federal condemnation of the Monongahela Navigation Company property may be traced in the *ARCE*, especially *ARCE*, 1897, pp. 2417-19, which reviews the case. Pittsburgh newspapers and correspondence in RG 77, NA, provide details about the events of July, 1897, in connection with the Free Monongahela celebration.

Plans for reconstruction of the company locks and dams are in *ARCE*, 1897, pp. 2419-24.

The *ARCE*, from 1882 to 1903, outlines the construction of Herrs Island Dam. See also "The Foundations of the Herr Island Lock and Dam," *Engineering News*, XXXVI (August 20, 1896), 127-28; William L. Sibert, "Artificial Waterways in the United States," *Transactions of the American Society of Civil Engineers*, LIV (1905), 277-78; John W. Arras, "Pittsburgh Waterway Improvement Problems," *National Waterways* (October, 1929), 65-66; and the John W. Arras Papers (material loaned by descendants; copies in Pittsburgh District Library). Fred R. Herr, "Herr's Island," *Western Pennsylvania Historical Magazine* LIII (July, 1970), 211-26, supplies a history of the island.

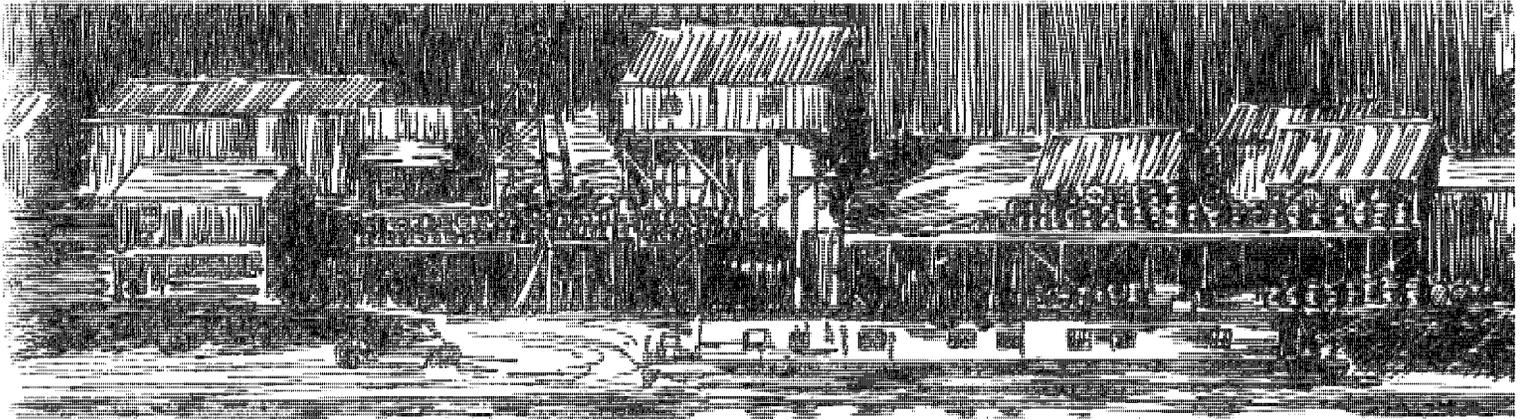
Chapter 10

A GOLIATH AT THE FORKS

The effects of the July 1888 flood are described in *ARCE*, 1888, p. 1666, and *ARCE*, 1889, p. 1870-74.

The operations problems at Davis Island Dam are described in the *ARCE* from 1886 to 1919 and are summarized in William L. Sibert, "The Improvement of the Ohio River," *Transactions of the American Society of Civil Engineers*, LXIII (1909), 388-428; John W. Arras, "Locks and Movable Dams of the Ohio River," *Professional Memoirs, Corps of Engineers*, III (October, 1911), 546-50; William Martin, "Bear-Trap Gate in Davis Island Dam," *Journal of the Association of Engineering Societies*, XVI (June, 1896), 208-10; John W. Arras, "The Ohio River," *Engineers' Society of Western Pennsylvania Proceedings*, XXIV (June, 1908), 250-51; and John W. Arras to District Engineer, "Dam No. 1, Ohio River: Its Condition and Need for Radical Repair or Reconstruction," in Box 16, Entry 1289, RG 77, NA, Philadelphia Federal Records Center.

The Allegheny River Bridge controversy may be traced in Edward B. Clark, *William L. Sibert, The Army Engineer* (Philadelphia, 1930); William L. Sibert, "Full Use of the Rivers at Pittsburgh and the



Removal of the Obstructions to Such Use," Engineers' Society of Western Pennsylvania *Proceedings*, XVIII (1902), 345-60; John W. Arras Papers, Pittsburgh Engineer District; "Federal Authority over Rivers," *Engineering News-Record*, XCII (May 22, 1924), 884-85; V. R. Covell, "The Bridge-Raising Program on the Allegheny River in Allegheny County," Engineers' Society of Western Pennsylvania *Proceedings*, (March, 1925); War Department, *Opinion of the Secretary of War in Re Elevation of Bridges over the Allegheny River at Pittsburgh* (Washington, 1917); *Pittsburgh First*, IV (February 3, 1923), 12; and the many cubic feet of correspondence in File 34428, General Correspondence, 1894-1923, RG 77, NA.

The reconstruction of the locks and dams on the lower Monongahela River may be traced through the *ARCE* from 1897 to 1920 and the following materials: Lewis M. Adams, "An A-Frame Movable Top to Provide Increased Depths above Fixed Dams," *Professional Memoirs, Corps of Engineers*, III (April, 1911), 315-55; Horton W. Stickle, "Monongahela River Navigation," *Professional Memoirs, Corps of Engineers*, X (November, 1919), 695-713; Jarvis J. Bain, "What the Corps of Engineers, U. S. Army, Have Done in the Pittsburgh District," *National Waterways*, (October, 1929), p. 86; Thomas P. Roberts, "The Monongahela River," Engineers' Society of Western Pennsylvania *Proceedings*, XXIV (May, 1908), 202-06; Lewis M. Adams, "A Complete Floating Concrete Plant," *Professional Memoirs, Corps of Engineers*, III (January, 1911), 83-88; Henry C. Newcomer, "Movable Tops for Fixed Dams," *Professional Memoirs, Corps of Engineers*, II (April, 1910), 202-12; and records in Entry 1289, RG 77, NA, Philadelphia Federal Records Center.

Some of the sources listed in the previous paragraph also furnish information on the extension of Monongahela slackwater to Fairmont. See also the *ARCE* from 1894 to 1906; U. S., Congress, House, *Monongahela River, Pa.*, H. Doc. No. 288, 67 Congress, 2 Session, 1922; and project records in En-

try 1281, RG 77, NA, Philadelphia Federal Records Center.

The story of the boat jam at Lock 9 is printed in *S&D Reflector*, V (September, 1968), 36. Monongahela lock operations problems are covered in the *ARCE*; J. L. Callard, "Dam No. 10, Monongahela River Damaged by Burning Oil," *Professional Memoirs, Corps of Engineers*, III (January, 1911), 74; Thomas Roberts, "The Monongahela River," Engineers' Society of Western Pennsylvania *Proceedings*, XXIV (May, 1908), 198-99; and correspondence in Entry 1289, RG 77, NA, Philadelphia Federal Records Center.

Records of the formation of the Wheeling District and the transfer of Ohio River dams to Pittsburgh District are in Box NA1130, RG 77, NA, Kansas City Federal Records Center; Entry 1348, RG 77, NA, at Washington National Records Service, Suitland, Maryland; and Files 19832, 37227, and 41804, General Correspondence, 1894-1923, RG 77, NA.

George Spalding's account of his 1903 interview with W. L. Sibert is located in Ohio Valley Improvement Association, *Proceedings of the Thirty-Sixth Annual Convention* (Cincinnati, 1930), pp. 71-72. The report in which Sibert proposed a nine-foot depth for navigation on the upper Ohio River is printed in *ARCE*, 1903, pp. 1688-94. See also Edward B. Clark, *William L. Sibert, The Army Engineer* (Philadelphia, 1930), pp. 81-82; and Thomas Roberts, "Some Practical Views as to Transportation on Western Rivers," *Engineering News*, LXIII (February 17, 1910), 185-88.

Senator Ransdell's memories of the 1905 trip down the Ohio are printed in Ohio Valley Improvement Association, *Proceedings of the Thirty-Sixth Annual Convention* (Cincinnati, 1931), pp. 42-43. The Lockwood Board report on the nine-foot project is printed in U. S., Congress, House, *Ohio River*, H. Doc. 492, 60 Congress, 1 Session, 1908. See also, John L. Vance, "Sketch of Ohio River Improvement,"

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Chapter 11

SLACKWATER TO CAIRO AND OIL CITY?

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Chapter 12

YE DELUGE OR INUNDATION

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214; and *Final Report of National Waterways Commission*, S. Doc. 469, 62 Congress, 2 Session, 1912, pp. 22-25.

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Chapter 13

WATCHDOGS AT THE HEADWATERS

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Theodore Roosevelt's comments on the 1913 flood are printed in *Outlook*, CIII (April 5, 1913), 765-66. Colonel Charles Townsend's comments are printed in *Professional Memoirs, Corps of Engineers*, V (July, 1913), 429.

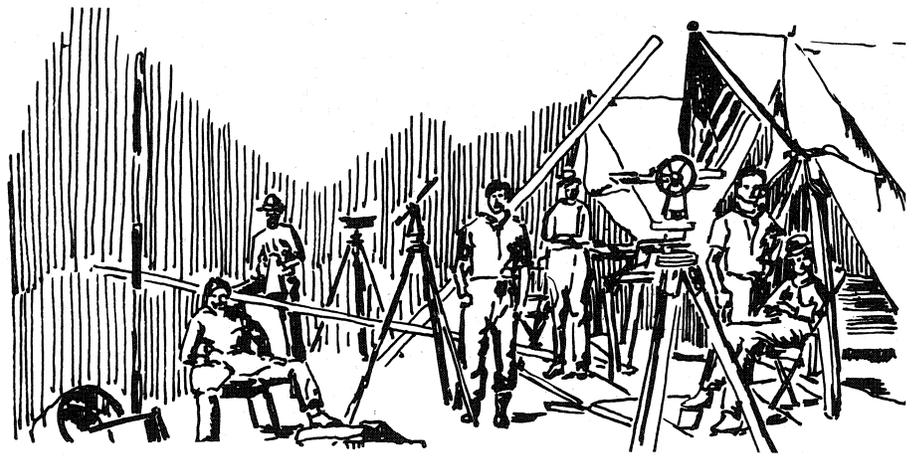
Ohio River Flood Board records are in Boxes 1133, 2295, 2293, RG 77, NA, Kansas City Federal Records Center. The reports of the Board are: U. S., Congress, House, *Report of Ohio River Flood Board*, H. Doc. 246, 63 Congress, 1 Session, 1913; U. S., Congress, House, *Prevention of Damage by Floods*, H. Doc. 914, 63 Congress, 2 Session, 1914; and U. S., Congress, House, *Flood Protection and Prevention*, H. Doc. 1792, 64 Congress, 2 Session, 1916.

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Cliff Morrison, retired from the Pittsburgh District, supplied information about James Getty and the District's 308 studies. See also records in Boxes 642 and 1252, Civil Works Files, RG 77, NA, at Suitland, Maryland. General Lytle Brown is quoted from *Congressional Record*, April 9, 1930, p. 7092. The 1928 Pittsburgh District report on the Allegheny and Monongahela basins is on file in Engineering Division Files, Pittsburgh District. See also Harold A. Thomas and Ross M. Riegel, *Review of Report of the United States Army Engineers on Flood Control Survey, Allegheny and Monongahela Rivers* (Pittsburgh, 1930); W. D. Styer, "Pittsburgh Area Inaugurates Its Flood-Control Program," *Engineering News-Record*, CX-III (July 12, 1934), 48-50; Wilmer Jacoby, "What We Have Learned About Flood Control," *National Waterways*, VIII (March, 1930), 35-39; and Roland M. Smith, "The Politics of Pittsburgh Flood Control," *Pennsylvania History*, XLII (January, 1975), 15-19.

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Operations of Tygart Reservoir are reviewed in "Pittsburgh Area Inaugurates Its Flood-Control Program," *Engineering News-Record*, CXIII (July 12, 1934), 48; Pittsburgh District, *Tygart Dam: Review of Operations, 1938-39* (Pittsburgh, 1940); and Robert M. Morris and Thomas L. Reilly, "Operations Experiences, Tygart Reservoir," *Transactions of the American Society of Civil Engineers*, CVII (1942), 1349-73.

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Arthur E. Morgan is quoted in Samuel S. Wyer, *Study of Inland Waterway Situation* (Columbus, 1931), p. 12. Correspondence with the public about the 1936 flood is filed in Box 1243, Civil Works, 1923-1942, RG 77, NA, Suitland, Maryland. See also Roland Smith, "The Politics of Pittsburgh Flood Control," *Pennsylvania History*, XLII (January, 1975), 19-22. The contribution of local and state governments to land acquisition for reservoirs was discussed at length in U. S., Congress, House, Committee on Flood Control, *Comprehensive Flood Control Plan for Ohio and Lower Mississippi Rivers*, Hearings on H.R. 7393 and H.R. 7646, 75 Congress, 1 Session, 1937.

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Minutes of the Board of Consultants meetings are in File 7402, Civil Works, 1923-1942, RG 77, NA, Suitland, Maryland. Dr. Shailer Philbrick supplied his memories of the meetings and activities of the Board. Engineering Divisions Files, Pittsburgh Engineer District, contain design and construction records on each dam and reservoir. Other worthwhile sources include Wilfred Bauknight, "Construction for Flood Control at Pittsburgh," *Civil Engineering*, XI (November, 1941), 637-40; Pittsburgh District, *Flood Control for Western Pennsylvania* (Pittsburgh, 1938); Pittsburgh District, *Tionesta Dam: Tionesta Creek* (Pittsburgh, 1939); "Mahoning Dam Model Studied at Case School," *Engineering News-Record*, CXIX (December 23, 1937), 1003; Pittsburgh District, *Mahoning Dam, Mahoning Creek, Analysis of Design* (Pittsburgh, 1938); Kenneth C. Cox, "Cantilever Forms Preferred at Mahoning," *Engineering News-Record*, CXXVII (October 23, 1941); Contracting Division, Dravo Corporation, *Locks and Dams* (Bulletin 402-C, Pittsburgh, 1947); "Crooked Creek Dam Placed in Service," *Greater Pittsburgh*, XXI (November, 1940), 14; Pittsburgh District, *Crooked Creek Dam, Crooked Creek* (Pittsburgh, 1939).

Chapter 14

ARSENAL OF THE ALLIES

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Correspondence about the application of technology to warfare is in File 90789, General Correspondence, 1894-1923, RG 77, NA. The definitive work on military construction by the Corps of Engineers in the United States is Jesse Remington and Lenore Fine, *The Corps of Engineers: Construction in the United States* (Washington, 1972). For the services of the Engineers during the First World War, see Edgar Jadwin, "Modern Military Engineering," *Journal of the Franklin Institute*, CC (July, 1925), 1-33; and "What the American Army Engineers Did in the War," *Engineering News-Record*, LXXXII (May 15, 1919), 953-54. Materials relating to activities in the Pittsburgh Engineer District during the war include the *ARCE, 1917-19*; District Circulars in Entry 1310, RG 77, NA, Philadelphia Federal Records Center; and the John W. Arras Papers (Copy in District Library). Lansing Beach is quoted in *ARCE, 1920*, p. 24.

Minutes of the June 30, 1942, meeting of the Board of Consultants are in File 7402, Box 1803, Civil Works, RG 77, NA, Suitland, Maryland. Other information was supplied by Dr. Shailer Philbrick and General Herbert D. Vogel. Details of the construction of Youghiogheny Dam can be located in Engineering Division Files, Pittsburgh District; Pittsburgh District, *Pertinent Data: Youghiogheny Dam* (Pittsburgh, 1940); U. S., Congress, House, *Youghiogheny River*, H. Doc. 644, 78 Congress, 2 Session, 1944; Ralph Edgar, "Flood Control and Our War Effort," *Greater Pittsburgh*, XXIII (January, 1942), 12-13; "Belt Delivers Fill for Earth Dam," *Engineering News-Record*, CXXIX (December 3, 1942), 75-78; and "Youghiogheny Dam Completed in Two Years," *Engineering News-Record*, CXXXII (January 6, 1944), 3.

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the airfield and filter center projects is located in Entry 391, Completion Reports, RG 77, NA, Suitland, Maryland; and in Box 650, Civil Works District Files, RG 77, NA, Suitland, Maryland. See also "Pittsburgh Airport Job Postponement Probable," *Engineering News-Record*, CXXXII (January 6, 1944), 11; and "The Saga of Pittsburgh's Airport," *Greater Pittsburgh*, XXXIV (June, 1952), 4. Runway pavement testing is described at length in Remington and Fine, *The Corps of Engineers: Construction in the United States* (Washington, 1972).

Activities within Pittsburgh District during the Second World War are outlined in some detail in the District's monthly publication *Check Posts* printed during the war years. Copies are available in the Herbert D. Vogel Papers, Syracuse University, and in the personal papers of Mary "Skip" Ploeger.

Details of construction of military installations are found in Entry 391, Completion Reports, RG 77, NA, Suitland, Maryland.

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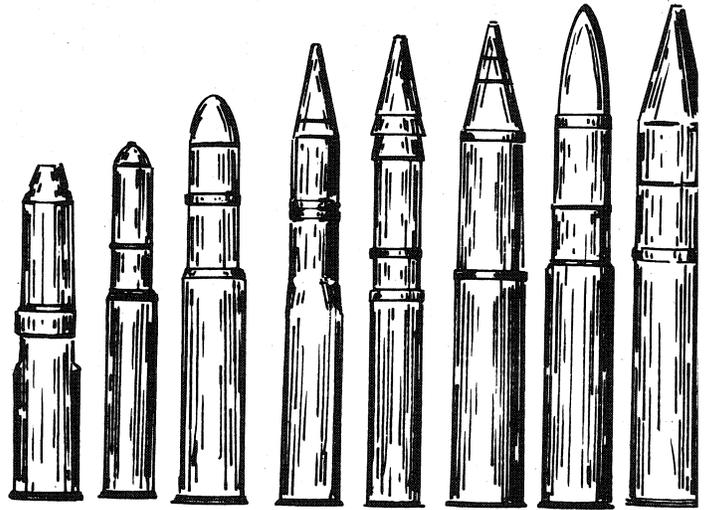
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ander W. Dann, "Transport by River Today," *Greater Pittsburgh*, XXIII (June, 1942), 26-27; Fred Way, "Ol' Man River Jes' Keeps on Rolling," *Greater Pittsburgh*, XXI (January, 1941), 8-9, 41; J. H. Dodds, "Let Us Safeguard Our Rivers," *Greater Pittsburgh*, XXV (January, 1944), 34-35; U. S., Congress, House, *Use of Barge Transportation for the Movement of Petroleum Products*, H. Doc. 731, 77 Congress, 2 Session, 1942; C. W. Stoll, "The LST," *S&D Reflector*, XIII (March, 1976), 46-47, and (June, 1976), 5-6; and P. W. Loveland and T. P. Bailey, "Navigation on the Ohio River," *Military Engineer*, (May, 1949), 174. Robert C. Downie, "Pittsburgh's Production for Victory," *Greater Pittsburgh*, XXVII (February, 1946), 20-21, summarized Second World War production in Pittsburgh Ordnance District.

For the history of military supply activities, see the John Ploeger Papers in possession of Mary "Skip" Ploeger, retired from Pittsburgh District, and the papers of Wilfred Bauknight, retired from Pittsburgh District. See also Thomas M. Pitkin and Herbert R. Rifkind, "Procurement Planning in the Quartermaster Corps, 1920-1940," *Q. M. C. Historical Studies*, I (March, 1943). The Pittsburgh District *Information Bulletin*, printed monthly and bimonthly, furnishes considerable information about military supply activities, and construction of VA Hospitals, Army Reserve Centers, NIKE Missile installations, and the Missile Master Center. See also M.R. McCarthy, "Air Defense--Pittsburgh," *Greater Pittsburgh*, XLIX (May, 1967), 9-13; C. W. Ogden, "Bailey Bridge Mass Produced," *Civil Engineering*, XV (May, 1945), 203-05; and "Pittsburgh District Corps of Engineers since 1868," *Greater Pittsburgh*, XXXVIII (June, 1956), 18.

President Kennedy's address on civil defense is printed in *New York Times*, May 26, 1961. Information on the Civil Defense Mission was supplied by Frank R. Stocker, retired from Pittsburgh District. See also U. S. Army, Corps of Engineers, *The Corps of Engineers: The Contributions of Its Civil Works to National Preparedness* (Washington, 1964).



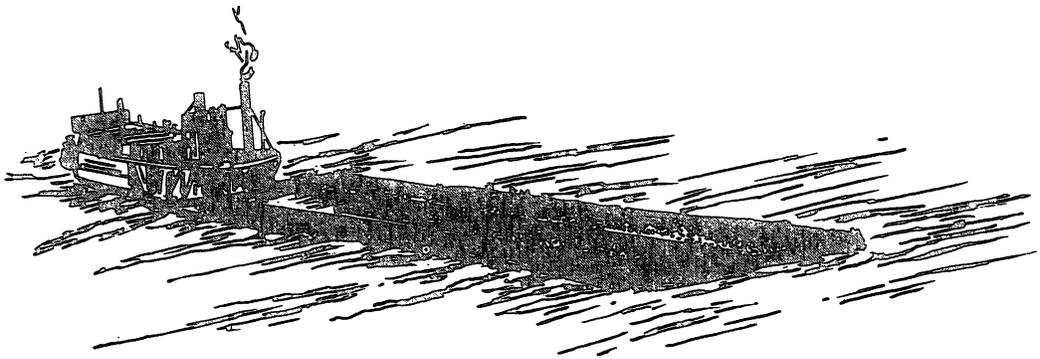
Chapter 15

RIVERS ARE HIGHWAYS THAT MOVE

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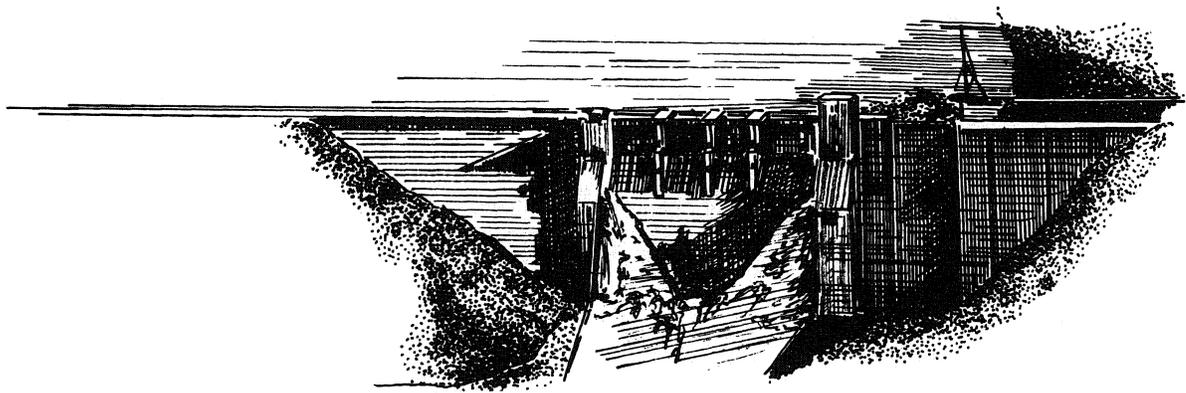
Chapter 16

POSTWAR PROJECTS AND POLITICS

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Chapter 17

LAKE PERFIDY AND AGNES

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Staples is retired from Pittsburgh District and loaned his papers.

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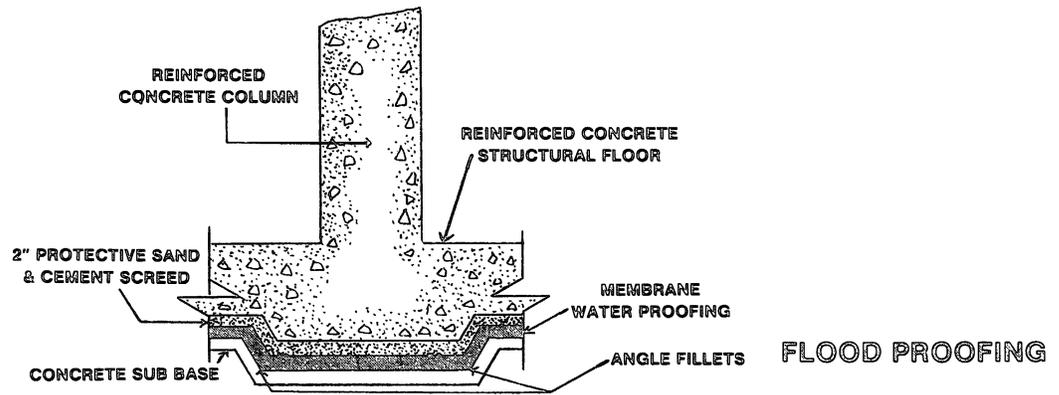
Chapter 18

THE WATER CRISIS

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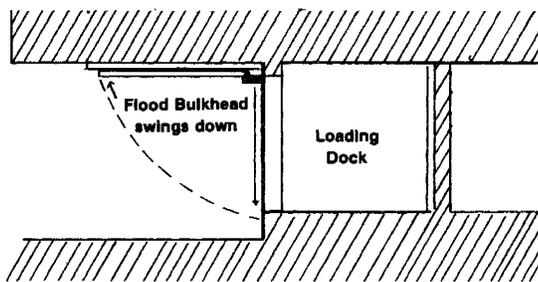
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A transcript of Colonel Max R. Janairo's remarks on Engineer Day, 1975, is located in Public Affairs Office Files, Pittsburgh Engineer District. The address of General John W. Morris in which he reviewed developments during 1965-1975 and speculated upon the future was distributed by Public Affairs Office, Office of the Chief of Engineers, Washington, D. C. The comments of Jacques S. Minnotte are quoted from the Pittsburgh District, *Information Bulletin*, January, 1977.

Chapter 19

RETURN TO JOHNSTOWN

District Engineer, Colonel Max R. Janairo, Jr., *Johnstown Tribune Democrat* "Be ready and pray -- and clear out the basement." Portion of 1974 Flood Plain Information Study for Cambia and Somerset Counties.