

Ohio Valley Commerce, 1787-1936*

CHARLES K. PALMER

The recent completion by the Federal government of fifty-two locks and movable dams to provide nine-foot slack-water navigation on the Ohio River has directed attention to the importance of this river as a unit in the transportation system of the nation. In its original condition the river was much obstructed throughout its entire length by snags, rocks, and gravel and sand bars, rendering navigation difficult and hazardous. The width of the channel was exceedingly variable. The depth available for navigation over the worst shoals at extreme low water was as little as from one to two feet. The slack-water project was planned to correct this situation.

The first lock and dam on the Ohio River was provided for by the River and Harbor Act of March 3, 1879, which appropriated funds for a lock and movable dam at Davis Island, four and seven-tenths miles below Pittsburgh, Pennsylvania. This dam was expected to be lock and dam Number 1 of a six-foot slack-water system. The existing project was adopted by the River and Harbor Act of June 25, 1910. This provided for fifty-four locks and movable dams for nine-foot slack-water navigation. In all fifty-two locks and dams were built at a total cost of \$117,379,160.01. Much discussion as to the feasibility of the project between those who favor the project and those who oppose it has occurred since the date of the first act. It is not the purpose of this paper to enter into this discussion, but an attempt will be made to trace briefly and as accurately as possible the progress of commercial development in the Ohio Valley both before and after the commencement of the project.

The first real settlement on the Ohio at Pittsburgh was the focal point for trade between the valley of the Ohio and the Atlantic seaboard. A small amount of commerce was maintained about Pittsburgh and on the Monongahela River

* In 1932 the writer presented to the Department of History of Indiana University, a master's thesis, entitled "Improvement and Navigation of the Ohio River, 1787 to 1925." This thesis was based on data collected after 1923. Since writing the thesis, the author has attempted to keep up with information relating to the subject. In pursuance of this effort, chambers of commerce, river and harbor conventions, and governmental agencies have proved to be good sources of information. The author has also done further research on the commerce of the Ohio Valley at the University of Wisconsin. The last chapter of the thesis was a summary of the history of commerce on the Ohio River. Commercial data have been selected from the entire thesis, and this with additional matter has been incorporated with the original summary to make up the paper here presented. No attempt has been made to incorporate any new facts relating to the great floods of February, 1937.

as early as 1788. It is estimated that at least four hundred persons passed the settlement each day on their way to Marietta, to "the falls," or other Ohio River points. The suggestion was made that roads be built along the banks that horses might be employed to draw up large barges. In 1789 the labor of twenty men working for eight to ten weeks was required to propel a forty-ton boat from New Orleans to the falls at Louisville. A few persons looked forward to the successful use of the experiments of Rumsey and Fitch, which as yet had not proved feasible. Meantime the expense of transportation was prohibitive. The cost of hauling forty tons of freight from Philadelphia to Pittsburgh and thence to Louisville was at the rate of \$40 per ton. For the river passage alone, the cost was but \$1.25 per ton.¹

The first line of packet boats, in the ordinary sense of the word, were keel-boats which plied between Pittsburgh and Cincinnati from 1793 onward. Boats of this type were able to reach Louisville eight or nine days after leaving Pittsburgh. In 1791 Fitch, Rumsey and Stevens patented improvements in the steam engine which were ultimately to reduce this time considerably. In 1782-1783 Messrs. Tardiveau and Honore of Brownsville, Pennsylvania, began a keel-boat trade to New Orleans which was later transferred to Louisville. By 1796 no less than a thousand flat-boats passed Marietta annually. A passenger boat each month traversed the river from Pittsburgh to Cincinnati. Mail service to Marietta, Gallipolis, and Limestone (Maysville), Kentucky, was opened and mail delivered twice a month.²

In 1800 the first ocean-rigged vessel left the Ohio for the sea. It was the *St. Claire* built in Marietta and commanded by Commodore Abraham Whipple, the leader of the Americans during the Gaspée episode. Trade on the river languished during the period from 1808 to 1810 because of Jefferson's embargo. This was particularly disastrous to the boat building industry for a time.³

The first steamer to be operated on western waters left Pittsburgh during the latter part of 1811. This was the *New Orleans*. It was followed by the *Comet*, built in 1812, and the

¹ Justin Winsor, *The Westward Movement, 1763-1789* (Boston, 1897), 48, 119.

² *Ibid.*, 175, 204, 298, 317-318, 413, 508, 510-512; Archer B. Hulbert, *The Ohio River* (New York, 1906), 230-231.

³ *Ibid.*, 241-242.

Vesuvius, of 390 tons, built in 1814.⁴ By 1816 the ultimate success of the new mode of transportation was definitely assured. Boats were being built at several ports on the river and a company had been formed at Cincinnati to carry on trade. The new steamboat *New Orleans* built in Wheeling in 1817 made the trip from New Orleans to Louisville in forty-one days. Before 1817 nearly all the commerce between the upper country and New Orleans was conducted in twenty small barges making annual trips. About 150 keel-boats made the trip between Pittsburgh and Louisville.⁵ On May 8, 1819, five steamboats passed Louisville *en route* up or down the river. At the same time seven boats were being constructed in the Louisville shipyards, and other cities on the river were as busy.⁶ After the completion of the Louisville and Portland Canal (1830), which permitted steamboats of small draft to descend the falls at all seasons of the year, trade from Pittsburgh to lower river points increased perceptibly. Sandbars, however, often necessitated unloading to get the boats free from the frequent groundings during low water.⁷

Pittsburgh, Cincinnati and Louisville grew rapidly as trade increased. Flour, pork, cider and beverages produced in those cities found a ready market farther down the river. Manufactured goods for domestic use in the valley rapidly replaced imports from the eastern seaboard and a large export trade grew with New Orleans and other Mississippi River points.⁸

Commerce changed considerably after 1840, and it was realized by 1860 that steps must be taken to care for it. Statistics taken from the Louisville Directory of 1838 show the total number of steamboats in service in the West and Southwest to have been then about 400. Of these, 112 were built at Pittsburgh, seventy at Cincinnati, and fifty-five at Louisville, New Albany and Jeffersonville. The remainder were built at other ports along the river. Four or five were constructed in eastern ports.⁹ The Cincinnati *Daily Gazette*

⁴ John H. Morrison, *History of American Steam Navigation* (New York, 1906), 190; Hulbert, *op. cit.*, 331-333.

⁵ James Hall, *The West, its Commerce and Navigation*, 13; Theodore G. Gronert, "Trade in the Blue Grass Region, 1810-1820," *Mississippi Valley Historical Review* (1919), V, 319.

⁶ Gronert, "Trade in the Blue Grass Region," *loc. cit.*, 320.

⁷ Timothy Flint, *The History and Geography of the Mississippi Valley* (2 vols., Cincinnati, 1832) I, 399.

⁸ Herbert Quick and Edward Quick, *Mississippi Steamboat* (New York, 1926), 42-43.

⁹ Hunt's *Merchant's Magazine and Commercial Review*, V., 470.

prepared a table in 1841 containing a list of 371 boats with a total tonnage of 64,928 tons. Thirty-five of these were built in Cincinnati in 1841.¹⁰ Thomas Allen of St. Louis, in a report to the convention held at Chicago in 1847, stated that the number of steamboats in western waters in 1846 was 1,200. He placed their value at more than \$16,000,000. In addition he estimated that there were 4,000 keel-boats and flat-boats in service.¹¹

In 1840 the value of products carried on western waters¹² amounted to about \$120,000,000 and the trade was increasing rapidly.¹³ Much of the commerce at that time was local, and centered around Pittsburgh, Cincinnati and Louisville. In 1843 it was estimated that no less than 400,000 hogs were packed for shipment at or near Cincinnati. The chief exports of Louisville for the six years prior to 1843 included 400,000 pieces of bagging, 300,000 coils of rope, and 7,000 to 8,000 hogsheads of tobacco annually. With the other minor products the exports of Louisville were from twenty-five to thirty millions annually.¹⁴

During the period from 1844 to 1866, the freight traffic on the river did not change perceptibly. Most of the passenger traffic was taken over by the railroads, but the greater part of the coal shipments was still carried on the river. The barges then in use were four foot temporary boxes which were usually sold in New Orleans and were not returned up the river. The increase in the demand for both coal and lumber throughout the river area led to a new era in Ohio river commerce. By 1865 towing came into extensive use. Large barges, usually six or more feet in depth, were brought into service, and were towed in fleets of ten or twelve by means of steamboats built especially for that purpose. About forty such steamers were in service at Pittsburgh in 1866. Whereas the shipment of coal from Pittsburgh in 1844 was 2,500,000 bushels, by 1866, it had increased to about 40,000,000 bushels.¹⁵ Between 1844 and 1865 a large local carrying trade, which included both passengers and freight, developed on the Ohio.

¹⁰ *Ibid.*, VI, 92.

¹¹ George Conklin, *New River Guide* (Cincinnati, 1850), 48.

¹² Most of the statistics of this period include all the rivers rather than individual streams.

¹³ James Butler Bowlin, *Removal of Obstructions in the Mississippi and its Tributaries* (Washington, 1884), 11.

¹⁴ J. D. B. Debow, ed., *DeBow's Review*, 151, 152.

¹⁵ Twenty-five bushels to each ton.

Although a large portion of the river business had been taken over by the railroads by 1865, the *local* river trade, independent of the coal trade, became much greater than it had been in 1844. The proper accommodation of this larger trade was a matter of national importance because consumers down the river must get the best service at reasonable rates.¹⁶

The period from 1875 to 1904 witnessed a magnificent development of through coal traffic from the Pittsburgh area to points on the lower Mississippi. After 1904 the mining of coal in western Kentucky and Alabama resulted in the loss of much coal traffic to the Ohio. In spite of this loss, the river regained much trade in other lines so that it still carried over ten million tons of freight. Just before the World War, there was a drop of approximately a million tons. The statistics show a decline from 13,000,000 tons in 1905 to 6,000,000 in 1917. This was partly due to reduced operations necessitated by the fact that the canalization projects were incomplete and partly to reduced congressional appropriations. These two conditions combined to divert much traffic from the river.¹⁷

The War brought a realization that railways could not adequately handle all the nation's traffic. The Committee on Inland Water Transportation of the Council of National Defense, after an exhaustive survey, reported in favor of diverting as much of the heavy traffic as possible to the rivers and canals.¹⁸

The successive completion of the locks and dams has opened up new sections to navigation and has permitted a broader development of transportation on the river. From the low of 6,000,000 tons in 1917, the traffic on the Ohio increased to 15,737,076 tons in 1925; 22,066,937 tons in 1926; and 22,193,396 tons in 1927. This meant an increase of 375 per cent since 1917.¹⁹

The final completion of the series of locks and dams in 1929, opened to commerce one of the greatest systems of inland waterways to be found anywhere. The Ohio and its

¹⁶ Chief of Engineers, United States Army, *Report of 1887*, 245, 262ff. The 178 volumes of these *Reports* from 1824 to 1936 furnish much data on river transportation. Each *Annual Report* presents a detailed statement of improvements made to further the navigation of the Ohio River and tributaries. Each volume includes commercial statistics and other historical data.

¹⁷ *Transportation in the Mississippi and Ohio Valleys* (Transportation Series, Number 2), 12.

¹⁸ W. F. Decker, "Mississippi System of Waterways," *Review of Reviews*, 74, 604.

¹⁹ Pittsburgh Coal Exchange, *Do You Realize?* (Pittsburgh, 1922), 11; Chief of Engineers, *Report of 1934*, 715.

tributaries drain the most highly developed industrial district in the United States, if not in the entire world. Enormous deposits of mineral wealth such as coal, fire-clay, and limestone are mined or quarried on or near the river banks. Until quite recently, navigation on the lower end of the river near Cairo was interrupted at low water, but open river dredging operations now prevent stoppage. The Ohio River system, from the standpoint of present water-borne transportation consists of the Ohio River proper, and its principal tributaries. These are: the Allegheny; the Monongahela, with its tributary the Youghiogheny; the Muskingum; the Little Kanawha; the Kanawha; the Big Sandy and its two forks, the Luvisa and the Tug; the Kentucky; the Green; the Cumberland; and the Tennessee. Since the completion of the locks and dams in the lower river, the Ohio itself is navigable the entire distance from Pittsburgh to Cairo. The large navigable tributaries are either partially or entirely improved for slackwater navigation.²⁰

The length of the Allegheny is 325 miles, but being filled with rocks, bars, and shoals it is hazardous to navigate. The minimum low water navigable depth is about three feet. At present it is proposed to build eight locks and dams to maintain seven feet of slackwater navigation between Pittsburgh and Natrona, and eight feet between Natrona and Riverton, Pennsylvania. Four of these dams have been completed to date, and Capt. Thomas E. Clark, President of the Allegheny River Improvement Association, predicts the completion of two more during the next few years.²¹

The Monongahela River, formed by the junction of Tygart River and West Fork, is 128 miles in length. At present it is proposed to build 14 locks and dams between Pittsburgh and Fairmont, West Virginia. A portion of this work was completed by the Monongahela Navigation Company. Seven dams constructed by that company were acquired by the United States Government in 1897. Several of these have been rebuilt. In addition the government constructed locks and dams, Numbers 8 to 15, between the years 1897 and 1904. Some revision of the plans occurred following the latter year,

²⁰ Transportation Series, No. 2, 12: *House Documents*, 62 Cong., 3 Sen., 1159. See for map, between pages 2 and 3.

²¹ Chief of Engineers, *Report of 1931*, 67 Cong. 4 Sess. 1241; Ohio Valley Improvement Association, *Proceedings of the 30th Annual Convention* (Cincinnati, 1924), 38.

resulting in one dam being eliminated.²² Commerce on this river has greatly increased during the last few years. Twenty-eight million tons of freight were carried on sixty miles of the river in 1929, making it the most intensely navigated river in the world. This occurred, notwithstanding the fact that railroads paralleled it on each side. Transporting coal by water made it possible to save thirty-five cents per ton, as compared with the cost by rail. On the basis of the commerce for 1917, it is estimated this saving would replace every lock and dam on the river every three years. Owing to unusual conditions which exist upon this river it is possible to figure variations and costs rather closely.²³

The third river in importance below Pittsburgh is the Muskingum. It is formed by the junction of the Tuscarawas and Walhonding rivers at Coshocton, Ohio, and flows 107 miles to the Ohio joining that river at Marietta. It was improved by the state of Ohio between 1837 to 1841. In 1887 this work, consisting of twelve locks, eleven dams and five lateral canals, was taken over by the federal government. At present it is improved from Marietta to Dresden, Ohio, a distance of ninety-one miles. The last dam constructed was at Ellis, Ohio, which was completed in 1910. In 1922, 94,917 tons of freight, valued at \$1,516,007, were carried on this river. By 1930 the amount had increased to 746,314 tons. Packet connections with Pittsburgh have been maintained for several years.²⁴

The Little Kanawha River rises in West Virginia and enters the Ohio at Parkersburg, West Virginia. It is 158 miles long and is improved for a distance of forty-eight miles. The first improvements were made by private corporations who built four locks and dams providing four-foot navigation for forty miles. These dams were purchased by the government in 1905. At present there are five locks and dams, the United States having built Number 5 in 1891. This improvement made a fairly large commerce possible. Shallow draft boats are used above the last dam. During periods of low water, scarcely six inches of water are available for

²² Chief of Engineers, *Report of 1931*, 67 Cong., 4 Sess., 1223.

²³ *Ibid.*; E. E. Jennings, "Great Steel Corporations Prove Feasibility of River Transportation," *Manufacturers Record* (Baltimore, 1932), LXXXIII, No. 7, 67; Ohio Valley Improvement Association, *Proceedings*, 30th Annual Convention, 108. Chief of Engineers, *Report of 1931*, 1352.

²⁴ Chief of Engineers, *Report of 1931*, 1247-1249; *ibid.*, 1369.

open river navigation. In 1922 the river had a carrying trade of 32,412 tons.²⁵ In 1929 this had increased to 280,525 tons.

The Kanawha is a continuation of the New River and flows for ninety some miles from the Kanawha Falls to the Ohio, joining it at Point Pleasant, West Virginia. All of the river but the upper seven miles is improved. At first the states of Virginia and West Virginia improved the stream by open river methods. At present ten dams, eight movable and two fixed, are in operation, making a six-foot navigable depth available for ninety miles. Large quantities of coal were opened to markets by this improvement. During the five year period ending in 1930, the river carried a commerce of one and one-half million tons a year.²⁶

The Big Sandy River is in length one of the lesser tributaries of the Ohio. It is formed by the union of the Luvisa Fork and Tug Fork at Louisa, Kentucky. From there it flows northward twenty-seven miles and enters the Ohio at Catlettsburg, Kentucky. Its tributaries are much longer than the main stream. Luvisa Fork which rises in Virginia is 142 miles long, and Tug Fork rising in West Virginia is 137 miles long. Locks and dams Number 1 and 2 on the Big Sandy were completed in 1905, and Number 3 was completed in 1897. These dams were authorized under the acts of June 14, 1880, July 13, 1892, and March 3, 1899, providing for dams at Louisa, Buchanan, and Catlettsburg, Kentucky. A lock on Luvisa Fork at Gallup, Kentucky, and one at Saltpeter, West Virginia, on Tug Fork, were completed in 1910. One additional dam on each fork has been provided for, but are not yet under construction. The dams now in service form a six-foot navigable depth from the mouth of the Big Sandy to points twelve miles up Tug Fork, and eighteen miles up Luvisa Fork. The commerce on these rivers during the five-year period, 1918 to 1922, ranged from 42,173 to 111,012 tons per year. The minimum amount was carried in 1921²⁷

The Kentucky River is formed at Beattyville, Kentucky, by the junction of the three forks, North, Middle, and South. After leaving Beattyville it flows toward the northwest for 255 miles and enters the Ohio river at Carrollton, Kentucky. The first project on this river was completed by the state

²⁵ *Ibid.*, 1249-1252, 1369.

²⁶ *Ibid.*, 1252-1255, 1381.

²⁷ *Ibid.*, 1255-1258.

in 1844 and consisted of five locks and dams. This improvement extended for ninety-three miles. The United States acquired this property in 1879. At present there are fourteen locks and dams in operation, maintaining six-foot navigation to the junction of the forks at Beattyville. The first five dams of this series were completed in 1884; the fourteenth one was opened in 1917. The improvement has made possible an extensive traffic in logs, coal and oil. This trade has increased steadily since 1918. In 1922 it reached a total of 296,381 tons, but by 1930 had dropped to 11,186 tons.²⁸

Green River rises in Lincoln county, Kentucky, and flows west and northwest for 345 miles, entering the Ohio eight miles above Evansville, Indiana. It is navigable for 196 miles to Mammoth Cave. Its largest tributary, Barren River, is 108 miles in length, and enters Green River, near Woodbury, Kentucky. Barren River is navigable to Bowling Green, twenty-nine miles above its mouth. As in the case of the Kentucky River, this system was improved by the state between 1835 and 1841. When the United States took over the project in 1884, there were five locks giving four-foot navigation to Bowling Green. The four dams on Green River provided navigation to the mouth of Barren River. By completing dams five and six in 1899 and 1905, respectively, slackwater navigation was opened to Mammoth Cave. Boats of five feet draft may navigate the rivers throughout the year. Rough River, another tributary 126 miles in length, is improved twenty-nine miles to Hartford, Kentucky.²⁹

Commerce on these three rivers is not very extensive. Rough River commerce is carried in small steam and gasoline boats of less than three feet draft. Its commerce averages about 5,000 tons annually. Green and Barren rivers have a combined commerce of about 550,000 tons annually.³⁰

The Cumberland River is the second largest tributary of the Ohio river. It is formed in Harlan county, Kentucky, by the junction of Poor and Clover forks and flows into the Ohio at Smithland. It is about 687 miles in length and is navigable for about 500 miles of this distance. Thirteen locks and dams are at present in operation and twelve are either proposed or under construction. It is expected that Ohio River lock

²⁸ *Ibid.*, 1264-1366; American Rolling Mills Company. *River and Shipping and Industry* (Middletown, Ohio, 1923), 89-90; Chief of Engineers, *Report of 1934*, 1400.

²⁹ Chief of Engineers, *Report of 1931*, 1272-1278.

³⁰ *Ibid.*, 1276, 1278, 1404.

and dam Number 52 will create a six-foot pool to dam F, which is nearing completion. Locks A, B, C, D and E lettering from near Nashville, Tennessee, have been completed since 1904. Until lock and dam Number 52 (Ohio River) was completed, the channel up to Lock F was dredged.³¹

Twenty-one additional locks and dams are projected between Nashville and a point twenty-nine miles below Burnside, Kentucky. When completed these will furnish a minimum six-foot slackwater stage. At the present time locks and dams one to seven and twenty-one have been completed. Number eight is under construction at the present time. Although commerce on the Cumberland is important, it cannot reach its maximum until the completion of lock F at Eddyville, Kentucky. In 1922 the commerce of the river was 287,607 tons. In 1930 it was 2,585,855 tons.³²

The Tennessee River is the largest of the tributaries of the Ohio. It is formed by the junction of the French Broad and Holston rivers just above Knoxville, Tennessee. It enters the Ohio at Paducah, Kentucky, 650 miles from Knoxville. Navigation of this stream from Riverton, Alabama, to its mouth is practically unimpaired, except during the low water stage. Government operations on the stream below Riverton have been in the nature of open channel work. By this means the 226 mile stretch has been opened to six-foot navigation the greater part of the year. It is proposed to build a lock below Kingston, Tennessee, to provide a six-foot stage. The absence of adequate congressional appropriations, however, has prevented any action being taken in this matter. The main result of the improvements has been to open the river to boats of four to six-foot draft. The average annual commerce of the river is about 2,250,000 tons.³³

The tributaries of the Ohio River are nearly all lined with coal mines. Many of these are directly on the rivers, or are near enough that the coal can be dumped into barges moored along the banks. Ordinary barges carry from 600 to 1,000 tons and draw six to nine feet of water. This coal is then floated or towed down the river and is unloaded directly at manufacturing plants, also located on the river. However, not all the mines on the river use water for purposes of transpor-

³¹ *Ibid.*, 1159-1164.

³² *Ibid.*, 1166-1169, 1310.

³³ *Ibid.*, 1170 ff., 1310.

tation. In 1908 a total of 1357 shippers out of 1425 used the railroads entirely. Not infrequently, it is impossible for mines to ship directly to the river because of high rates or inability to get tippie space on the river front.³⁴

Statistics prove that the upper tributaries of the Ohio are more productive of commerce than the lower ones. This is no doubt in part due to the fact that they are improved more extensively.³⁵ The upper Ohio River is today the greatest producing area for coal and coke in the world. It is also an important iron and steel manufacturing center.³⁶ Pittsburgh is at present one of the great ports of the United States, and it owes its growth largely to the fact that it is at the head of a great system of inland navigation, which gives it a not expensive outlet for its products.³⁷ Pittsburgh has about fifty miles of river within its limits, but very little of it is improved. There are very few terminal facilities, but some steps are being taken to improve this condition. There is public coöperation in the handling of local and packet freight, but the handling of coal and steel is mostly under private control.³⁸

Mr. Peyton, whose work has been previously cited, can hardly be said to favor the project of securing a nine-foot slackwater stage. In fact, he makes some rather caustic remarks on the subject. He gives a few figures, however, which indicate the present trend of commerce in the Pittsburgh district. In part, he says: "Seventy-five per cent of the entire shipment of freight on the Ohio river from Pennsylvania and the portion of the Monongahela river in West Virginia belongs to the Monongahela Consolidated Coal and Coke Company. Of the balance, twenty-three per cent belongs to six other coal companies and two per cent to all other interests".³⁹ He states that the amount of coal carried in 1907 by the Monongahela River Consolidated Coal and Coke Company (in ton-miles) was 1,864,112,480 miles; the six other companies mentioned by him, 559,931,388 ton-miles; and all other traffic, 40,253,392 ton-miles.⁴⁰

³⁴ John Howe Peyton, *The American Transportation Problem* (Louisville, 1908), 112; Harold Glenn Moulton, "Railways vs. Waterways," *Journal of Political Science* (1913), 898.

³⁵ Chief of Engineers, *Report of 1931*, I. See Index for Rivers.

³⁶ W. G. Irwin, "Waterway Improvement on the Ohio River," *Illustrated Scientific American* (August 15, 1908) LXXXIX, 117.

³⁷ Edwin E. Sparks, "The Influence of the Ohio River in Western Expansion," *Ohio Valley Historical Association, Proceedings*, 1911, 11.

³⁸ American Rolling Mill Company, *op. cit.*, 75-78.

³⁹ John Peyton, *op. cit.*, 116-117.

⁴⁰ *Ibid.*, 116-117.

The fact that the Ohio River system until recently has not been fully improved has to some degree retarded the development of Pittsburgh. Notwithstanding this the city has become the seventh port of importance in the United States. It is exceeded by New York, Philadelphia, San Francisco Bay, Duluth-Superior, Hampton Roads, and Los Angeles. In 1922 it was in fourth place. Conditions are such that other than railroad facilities are necessary to care for the vast traffic which centers there. Although there was once a time when the railroads opposed the improvement of the river, they now realize that it is the only thing that can relieve the congestion.⁴¹

At present coal barges and boats from the upper tributaries of the Ohio, carrying from 500 to 1,000 tons are collected in the pools immediately below Pittsburgh to await a rise in the river. These small fleets are usually made up of boats in sizes of 3,000 tonnage or less (coal), as that is a more convenient size for the locks. At Pittsburgh these are collected in fleets of 10,000 to 15,000 tonnage and sent to Louisville. After passing the Louisville and Portland Canal these are combined into fleets of 35,000 tons or more, and in that form are taken by powerful tow-boats to New Orleans.⁴²

Coal transportation has been one of the greatest factors in Ohio River commerce. Coal transportation from Cincinnati and Louisville is much greater than it was in the past. This trade out of Cincinnati increased from 56,434,707⁴³ bushels to 62,572,000 bushels, between 1893 and 1906. The increase in coal transportation for the entire river between 1850 and 1996 was from 12,000,000 to 257,000,000 bushels. With the exception of coal and lumber the commerce of the Ohio has degenerated to purely local trade. Although there are over forty railroad crossings between Pittsburgh and Cairo, there are few means of transfer between the railroads and waterways.⁴⁴

Several reasons may be given for the decline in river trade. The railways have a better and wider area of distri-

⁴¹ W. G. Irwin, "Waterway Improvement", *loc. cit.*, 117; National Rivers and Harbors Congress, pamphlet, quoting Chief of Engineers, *Reports of 1934*, II.

⁴² Emory R. Johnson, "Inland Waterways, their relation to Transportation," *American Academy of Political and Social Science* (Philadelphia, 1892), II (Supplement), 362-363.

⁴³ Eighty pounds to the bushel.

⁴⁴ H. G. Moulton, "Railways vs. Waterways," *loc. cit.*, 67, 94, 392.

bution due to interline transfers and rates. Wharfage, truck hauls and transfers between the river and the railroads take away a large part of the profits of river trade. The fact that there are no adequate storage facilities and the uncertainty of schedules also tend to handicap trade by water. Only the building of sufficient terminals and the standardizing of schedules will solve the problem adequately.⁴⁵

The best means of returning to an increased river traffic is to secure harmonious relations between railway and water lines.⁴⁶ Some means should be devised to protect river lines from unfair railroad competition. A plan should be adopted for an interchange of freight between railroads and waterways. Otherwise the boat lines will still be under the control of the railroads.⁴⁷ At times railroads have established competitive boat lines, or have purchased interest in existing lines in order to kill competition where such railroads and river lines parallel. This has frequently occurred on the Ohio river. This type of competition is disastrous to river trade.⁴⁸

More recently railroads have changed their attitude towards the project. After carefully studying the possibilities of using a modern river transportation system, properly engineered, to attain an average ton-mile cost, including legitimate charges for a round trip between Pittsburgh and New Orleans, several high-salaried railroad executives reached the conclusion that no railroad can compete with river transportation using modern methods properly engineered. Railroads are beginning to realize that the railroads and a modern river transportation project each have a non-competitive service to render to the shipper. They are even offering to coöperate.⁴⁹

Because of the large number of industrial cities which are located along its banks, the Ohio River has great prospects for future development. Such cities as Pittsburgh, Cincinnati, Louisville, Evansville and Paducah have a thriving trade among themselves and other cities in the Mississippi valley. They have been waiting for the completion of the nine-foot

⁴⁵ *Ibid.*, 403; Albert B. Hart, "Biography of a River and Harbor Bill," *American Historical Association Papers*, 1889, III, 180-196; Albert Bettinger, "The Future of Navigation on our Western Rivers," *Ohio Valley Historical Association, Annual Report*, 1911, 84.

⁴⁶ *Senate Document*, No. 301, 61 Cong., 2 Sess., II, 10.

⁴⁷ A. B. Hart, "Biography of a River and Harbor Bill," *loc. cit.* 165; Chief of Inland and Coastwise Waterways Service, *Annual Report* (Washington, 1923), 8, 9, 10.

⁴⁸ Hart, "Biography of a River and Harbor Bill", *loc. cit.*, 158.

⁴⁹ E. E. Jennings, "Great Steel Corporations," *loc. cit.*, 64.

project, to increase this.⁵⁰ Great freight steamers are now being built to handle the traffic that will have to be accommodated since the system of locks and dams is completed.⁵¹ In a little pamphlet issued in 1922, the Ohio Valley Improvement Association said in part: "Notwithstanding this slow progress of the work . . . in anticipation of the ultimate completion, towns and cities along its course have either actually erected, or are planning to erect suitable terminals and loading places for the speedy and cheap handling and transfer of freight and cargoes, and in some instances most extensive private terminals have been erected and others are contemplated."⁵² Some of the cities that have planned to establish public terminals are Pittsburgh, Steubenville, Portsmouth, Cincinnati, Louisville and Evansville. During the past few years several companies that have used the river for transportation have been shipping by river and inquiries reported to the engineers' office at Pittsburgh indicate that others contemplate using that means as soon as conditions warrant.

Usually the terminal charges on either railroads or river equal or exceed the entire cost of transportation. Although the government has not undertaken the building of free public terminals, such a course would be desirable. Such terminals as now exist are not adequate for satisfactory public use. Most cities have felt that terminals should not be built until the nine-foot project was completed. As most of the Ohio River cities are aware of the advantages that are accruing, now that the new project is opened, it is anticipated that many such terminals will be erected. In fact many have already been completed.⁵³

The railroads of the country have practically reached the limit in their efforts to serve the public. The people have already begun to realize this, and are devising means to better use the navigable waterways as a part of the transportation system.⁵⁴ Statements by Mr. Markham, president of the Illinois Central railroad, and by vice-presidents McCrea and Lee of the Pennsylvania railroad indicate that the railroads

⁵⁰ Moulton, "Railways vs. Waterways", *loc. cit.*, 392, 393.

⁵¹ Irwin, "Waterway Improvement", *loc. cit.*, 117.

⁵² Ohio Valley Improvement Association, *Statement of Facts* (pamphlet) Cincinnati, 1922, 9.

⁵³ "Ohio River Terminals," 3. *House Document*, No. 561, 66 Cong. 2 Sess.

⁵⁴ J. E. Smith, "The Relation of Inland Waterways to Foreign Trade," Mississippi Valley Waterways Association, *Bulletin*, 1922, 318.

of the country are so far inadequate to care for the commerce of the nation. Instead of the railroads preparing for the increase, more mileage has been abandoned than has been built. Mr. Lee stated that traffic as measured by ton-miles doubles once in a decade. C. A. Newton, of Missouri, who quotes from the above mentioned persons, continues: "The thing that the people of this country are interested in is an adequate system of transportation, made up of railways, waterways and highways, constituting a system able to meet the commercial needs of the country, capable of aiding our commercial growth and development and which will produce transportation at the least possible cost."⁵⁵

Finding themselves pressed for transportation facilities due to after-war rail conditions, leading steel corporations sought supplementary facilities. Waterways were pressed into service and the Jones and Laughlin Steel Corporation sent their first shipments down the Ohio and Mississippi rivers in October, 1921. The service has been greatly hampered by lack of water which necessitated the making of irregular trips. It is expected that this new type of service may cause the slumping commerce of the Ohio to rise again.⁵⁶

Since Jones and Laughlin sent the first barge down the river, other companies have seen the possibility of such a service. Among these are the Wheeling Steel Corporation, Carnegie Steel Company, Pittsburgh Steel Company, Inland Steel Company, and the Illinois Steel Company. After the steel has been shipped down the river it is frequently transferred to railroad cars to be sent to points farther west. Products sent in this manner include wire, nails, bars, fence and similar types of metal parts.⁵⁷

Coal traffic, as previously stated, is chiefly under the control of large corporations. One such corporation owns nearly 100 tow-boats and 3,000 barges, in which this corporation carries over 4,000,000 tons of coal annually. Although only one corporation has such an enormous trade the others rank very high. Most of the coaling trade originates at Pittsburgh and forms much of the through shipping trade to Mississippi river points.⁵⁸

⁵⁵ Cleveland A. Newton, "Transportation and Rates: A Strong Argument for Water Transportation," *Manufacturers Record*, February 15, 1923, 75.

⁵⁶ Jennings, "Great Steel Corporations", *loc. cit.*, 67.

⁵⁷ *Ibid.*, 68, 69.

⁵⁸ E. R. Johnson, *op. cit.*, 347, 348, 349.

One of the arguments used in favor of the project is that it will reduce railroad rates. This is no doubt true, but that should not be made the basis for making improvements. The railroads are necessities that should be correlated with the waterways projects. There is no economy in expending money upon improvements that will not be used, merely to make reductions which might as easily be gained by legislation.⁵⁹ In the first place it is unfair to compare relative rates on railroads and improved waterways. In the former case, the right-of-way is maintained by private companies, while in the latter case it is done at government expense. If they are to be maintained upon an equal basis, the government must charge tolls on traffic passing the locks. Basing these upon the actual investment, the rates would be rather high on commerce as it now exists.⁶⁰

C. A. Newton, in 1923, stated that the Mississippi Barge Line, a government corporation, has unquestionably demonstrated the economy of water transportation. This company carried freight at a rate of 3.31 mills per ton-mile, while the railroad rate during the same year was 10.78 mills per ton-mile. Taking the entire year as a basis, the Line lost money as a part of its route lay in unimproved river. Low water forced it to suspend operations for three months, causing a deficit for the year. During the other nine months it made a profit of a half-million dollars.⁶¹

Although many extravagant claims have been made in favor of river improvement by various individuals and associations there can be no doubt that traffic will be decidedly increased. The Ohio Valley Improvement Association lays much stress upon its belief that there will be a decided increase in manufacturing and trade throughout the Ohio valley because of it. Between 1919 and 1921 a total of \$31,842,000 was expended upon new boats and barges and much more has been spent that was not recorded by the Association. Much more will be spent now that the project is completed.⁶²

Throughout the history of river commerce, the Ohio River has had a much larger tonnage trade than the Mississippi River or any of its other tributaries. This is because

⁵⁹ *Senate Document*, No. 301, *loc. cit.*, 9-10.

⁶⁰ Moulton, "Railways vs. Waterways", *loc. cit.*, 404.

⁶¹ Ohio Valley Improvement Association, *Proceeding*, 29th Annual Convention, 19.

⁶² Ohio Valley Improvement Association, *Statement of Facts*, 8.

the coal and steel tonnage originating at Pittsburgh and along the Monongahela and Allegheny rivers is enormous. This traffic furnishes the bulk of the freight traffic on the Ohio River.⁶³

It has been pointed out that the project to provide a minimum navigable depth of nine feet the year around was not completed until October, 1929, the same month in which economists trace the beginning of the depression which proved so disastrous to business. With a general shrinkage in business activity, it is only natural to believe that many firms which might have used the river to advantage, would not, or could not, risk the large sums of money required to establish barge lines, and thereby deprived the river of much traffic which normally might have been expected. In spite of this condition, however, as may be seen from a perusal of commercial statistics, the value and tonnage of the commodities transported on the river resisted the general business trend and did not shrink in the same degree, according to indices, as other lines of business activity. As a matter of fact, while the total tonnage transported is still less than in 1929, the increase in value of the shipments during 1933, scarcely a normal business year generally, exceeded the value of shipments in 1929, the peak year of "prosperity". Reports, as yet unpublished, show a continuous increment in value of shipment.

The increase is illustrated by the shipment from steel mills near Pittsburgh and at Portsmouth, Ohio, to the lower Ohio and Mississippi. Total shipments to the Mississippi in the five years from 1926 to 1930 amounted to 1,350,000 tons, increasing from 160,000 tons to 336,750 tons per year. Large shipments of crude oil are being made from the Kentucky River and from Owensboro, Kentucky, to Louisville, while there are smaller movements of oil and gasoline in other parts of the river. The commercial effect in the upper and middle sections of the river was reflected in the marked increase in the amount of coal shipped from the mines along the Monongahela river to industrial plants on the Ohio River at Aliquippa and Midland, Pennsylvania, and Steubenville, Ohio, and the shipment of coal from the Kanawha River and Huntington to points downstream on the Ohio.⁶⁴

⁶³ Johnson, *op. cit.*, 329.

⁶⁴ See Reports of Chief of Engineers since 1930.

Passenger business on the river has fluctuated during the last sixty years as much as has freight traffic. The Louisville and Cincinnati Packet Company continues to run a fleet of passenger boats on the upper river. Also the Louisville and Evansville Packet Company runs several steamboats between Louisville and Stephensport. Among the famous boats of the latter line have been the *Tarascon*, the *Tell City*, the *Nashville* and the *Lizzie May*. Many old time river men are optimistic in their belief that the recently completed improvements will bring back the old river trade, because, "Where in the old days boatmen waited for months for the river to rise, they now find the needed depth . . . every day in the year."⁶⁵

The new spirit on the river is exemplified in the monster celebration of October 18, 1929, which accompanied the dedication of the new system of locks and dams. All the large cities and many of the smaller ones are partners in the prosperity that the Ohio water route makes possible. In commemoration of the completion of the project the Ohio Valley Improvement Association arranged a river parade to start at Pittsburgh and end at Cairo. The wharf at Pittsburgh was lined with twenty-five vessels steamed up and ready to go. President Herbert Hoover, aboard the *Greenbrier* made the trip as far as Louisville and made speeches at many places along the way.⁶⁶ Thus, a new era in Ohio river commerce was inaugurated.⁶⁷

⁶⁵ *Literary Digest* (1929), CIII, 28-30.

⁶⁶ Frederick Way, Jr., *The Log of the Betsey Ann* (New York, 1933), 370; Wilbur F. Decker, *Mississippi System of Waterways*, loc. cit., 599-609; Edmund L. Daley, "Modern Argosies on the Ohio," *Review of Reviews*, LXXX, 53.

⁶⁷ Current information may be obtained from the Secretary of the National Rivers and Harbors Congress, of Washington, D. C. Current statistics may also be obtained from the Secretary of the Ohio Valley Improvement Association, Cincinnati, and from the Divisional Office of Engineers, United States Army at Pittsburgh, Huntington (W. Va.), Cincinnati, Louisville, Chattanooga, and Nashville. The *Annual Reports* of the Chief of Engineers are in all libraries that have been designated by Congress as depositories of government publications. *Niles' Weekly Register*, *DeBow's Review*, and contemporary newspapers of Ohio River cities are valuable for commercial statistics of the early period. Complete, large-scale maps of the Ohio River are to be found in *The Ohio River* ("Charts, Drawings, and descriptions of features affecting navigation, War Department rules and regulations for the River, its tributaries, navigable depths and tables of distances for tributaries), Washington, D.C., 1916.