

The Manayunk Canal and the Schuylkill Navigation System: A Brief History

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Overview

The history of Manayunk, a section of Philadelphia along the Schuylkill River, is inextricably connected to the history of both the canal that runs through the riverfront of this hilly neighborhood, and the 108-mile navigation system of which the canal was once a part. In the present day, the canal is a key element of the Manayunk Main Street Historic District, listed on the National Register of Historic Places. In addition, the canal itself is listed on the Philadelphia Register of Historic Places.

The Schuylkill Navigation, built between 1815 and 1828, was one manifestation of a national movement for “internal improvements” to connect coastal cities like Philadelphia and New York with productive agricultural lands and mineral resources in the country’s interior. When first completed, this navigation system—sometimes misleadingly called the “Schuylkill Canal”—included 62 miles of canals and their associated locks, along with 46 miles of so-called “slackwater” on sections of the river pooled behind a series of dams.² It also included seventeen aqueducts, and a 450-foot tunnel near Auburn that was the first transportation tunnel built in the United States. The sum of these parts was a navigable waterway from tidewater at Fairmount in Philadelphia to Mount Carbon in the heart of the coal fields of Schuylkill County, Pennsylvania.

According to historian Edward J. Gibbons, the Schuylkill Navigation system was one of Pennsylvania’s “most successful internal improvement projects,” opening “the upper reaches of the Schuylkill River and contribut[ing] to the general economic development of the entire Schuylkill River valley. By making available the vast resources of the anthracite coal region, it fostered the growth of eastern cities and the development of the iron and steel industry.”³ The two mile canal section through Manayunk, which provided water power for factories as well as a

¹ This report was written for the Philadelphia Water Department and Philadelphia Parks and Recreation. The author would like to thank Rob Armstrong and Theresa Stuhlman for their encouragement and editorial acumen.

² Even though calling the entire system a “canal” may be misleading, I will take the liberty of doing so in this paper, since the word is much less tongue-twisting than “navigation system;” also, newspapers in the 19th century used it, and even the companies who owned the system referred to it as such in their reports.

³ Edward J. Gibbons, “The building of the Schuylkill Navigation system, 1815-1828,” *Pennsylvania History*, v. 57, no. 1 (Jan.1990), p. 13.

route for transportation, quickly transformed this small settlement into an industrial behemoth which was dubbed (in reference to England's major textile-producing city) "the Manchester of America." Employing thousands of workers and producing millions of dollars of goods a year, Manayunk played a key role in the industrialization of Philadelphia in the 19th century, which itself earned a nickname: "The Workshop of the World."⁴

Manayunk: From sleepy village to industrial behemoth

The neighborhood known today as Manayunk was originally part of Roxborough Township in Philadelphia County. It became the borough of Manayunk in 1840, and was absorbed into the City of Philadelphia along with the rest of the county under the Act of Consolidation in 1854. In the early nineteenth century it could hardly even be considered a village, containing just a scattering of a dozen or so houses in which lived, according to Charles V. Hagner, "about sixty souls." A shad fishery was located here, along with some farms and some meadow land, but the area then could boast of little else besides its bucolic scenery.⁵

Before the Schuylkill Navigation transformed the community, its construction first transformed the local landscape. Completed in 1819, the entrance to the upstream end of the Manayunk Canal is via the slackwater pool created by the Flat Rock Dam. Boats entered a guard lock (Lock 68), on the Manayunk side of the dam, which lowered them about two feet into the main part of the canal. A sluice lock operated by a lock tender controlled the flow of water into the canal at this location. The lock tender lived in a house several yards downstream from the sluice house, on the mainland side of the canal. Two locks at the downstream end (Locks 69 and 70) accomplished most of the lowering (or lifting, for boats going upstream), with a combined 24 feet.⁶ Exiting craft entered the final pool in the navigation system, backed up behind the Fairmount Dam, located about six miles downstream from Manayunk.

⁴ This brief historical overview will focus on the Schuylkill Navigation and the Manayunk Canal in particular. The history of the community and industries that grew up in Manayunk after the construction of the canal has been amply recounted elsewhere. Of particular note are the works of Cynthia J. Shelton, *The Mills of Manayunk: Industrialization and social conflict in the Philadelphia region, 1787-1937* (Baltimore: Johns Hopkins University Press, 1986); and Philip Scranton, *Proprietary Capitalism: The Textile Manufacture at Philadelphia, 1800-1885* (Cambridge: Cambridge University Press, 1983). Sarah Jane Elk provides a good overview of these more academic works, and also discusses in detail the industrial buildings that remained along the canal in 1990, in her chapter on Manayunk in *Workshop of the World: A selective guide to the industrial archeology of Philadelphia* (Wallingford, Pa.: Oliver Evans Press, 1990).

⁵ Charles V. Hagner, *Early history of the Falls of Schuylkill, Manayunk, Schuylkill and Lehigh Navigation companies, Fairmount Waterworks, etc.* (Philadelphia: Claxton, Remsen, And Haffelfinger, 1869), p. 55. The many dams constructed to create the Schuylkill Navigation (in particular the one furthest downstream, at Fairmount) prevented shad from returning to their upstream spawning grounds, and effectively ended shad fishing on the river. On the Delaware River, where no dams were ever constructed, the shad fishery was destroyed by gross sewage and industrial pollution of the river in the second half of the 19th century.

⁶ The total fall of the river overcome by all the locks of the navigation system was 588 feet. (Stuart William Wells, *The Schuylkill Navigation and the Girard Canal*. Unpublished master's thesis, University of Pennsylvania, 1989, p. 25. Wells' chapter on the construction, operation and demise of the navigation system provides a comprehensive historical overview of these subjects.)

Hagner describes what old inhabitants called the “Dead Waters... a kind of a natural canal extending from above Flat Rock bridge [which once crossed the Schuylkill River just below the Flat Rock dam, at present-day Domino Lane] down to nearly where the main road [Green Lane] crosses the canal. In high freshets⁷ the water flowed into it from above, but generally it was a kind of pool or swamp into which ran the little streams from the hills, having its outlet just above the canal bridge [probably the towpath bridge, located near Shurs Lane at the outlet of the canal]; the centre part of this swamp was much wider than the upper or lower part.”⁸ An 1808 map shows a series of small islands on the Roxborough side of the river, extending from Flat Rock Bridge (which was just below Flat Rock Dam) down past the future location of Manayunk.⁹ These islands might correspond to Hagner’s “Dead Waters,” and it is possible that the canal, as built, followed this natural channel. More likely, the material excavated from the canal was used to enlarge and connect these islands to create one single, continuous island between the canal and the mainland, now called Venice Island.¹⁰

The Navigation Company made money for its investors by charging tolls for freight carried on the system, and also by selling water power to mill owners on several of the canals, including those in Conshohocken and Manayunk. In Manayunk, the average fall of water from the canal surface to the tail race located at the bottom of the mills, through which water exited into the Schuylkill River, was about 22 feet. The mills were entitled to the water in the order that they rented it, with the last renter the first to have his water stopped in the case of any shortage. In times of drought, the water needed for navigation through the locks took precedence over the provision of any water for powering mills, which meant the mills could be (and often were) shut down during dry spells. Water was leased to mill owners by the square inch, and was usually taken in blocks of 50 or 100 inches. The company initially charged a rent of \$3 a year for each inch, which was raised to \$4.50 and, by 1832, to \$6.¹¹ Wrote Hagner:

I remember [the Schuylkill Navigation Company] advertising 150 mill-powers, sufficient to grind a certain number of bushels of grain, equivalent to about 100 inches of water each. I believe they were under the impression that there would not be ground sufficient along the bank to locate mills enough to consume the water. They were extremely anxious to sell power, but it hung heavily on their hands, and for three years after the water was let into the canal, up to January, 1822, they had only sold altogether 300 inches. Many persons came to view the

⁷ A freshet is an old term for a sudden overflow of a stream resulting from a heavy rain or a thaw.

⁸ Hagner, p. 52-53.

⁹ John Hills, *Plan of the City of Philadelphia and Environs*, 1808. Accessed at <http://www.philageohistory.org/rdic-images/view-image.cfm/HSF.D2G1.A>

¹⁰ It was not possible to fully research construction records for this brief history, or even determine if they exist; this section is just an educated guess. The author would welcome any documentation related to the construction of the canal.

¹¹ Samuel Hazard, ed., *Register of Pennsylvania*, v. 9, March 1832, p. 158.

place with the idea of purchasing power and building mills, but were unwilling to run the risk of the freshets, and declined.¹²

Prospective tenants were particularly afraid of “ice freshets”—floods in the late winter and early spring, as the frozen rivers were breaking up, which carried downstream large masses of ice which could be especially destructive. When Captain John Towers bought the first water power in 1819, Hagner remembered “the astonishment of every one around the country when they first heard that [he] had bought a narrow strip of rock, gravel, and juniper bushes, that never had any value before, for five thousand dollars, and was about to build a mill, where they were all sure the first ice freshet would sweep it off.”¹³ Hagner purchased the second water-power in 1820, and recalled that less than an hour after his workmen began digging the foundations for his new mill, an old man he knew who lived in the area

came over expressly to dissuade me from it. He appeared quite anxious on the subject. He said to me, “Charles, thee had better stop at once; thee will be ruined; thee can never build anything here to resist the ice freshets.” I must confess I had some doubts myself, but I had the winter before watched the effect of the ice going over the [Flat Rock] dam, and saw that when large cakes came down the river, and projected over the dam a short distance, they broke off with their own weight into small pieces, and came down comparatively harmless. Were it not for this simple effect, and we should have an old-fashion winter, a sudden freshet and breaking up of the ice, I very much doubt if many of the mills at Manayunk could resist it.¹⁴

Others eventually followed these two pioneers and set up water-powered factories in Manayunk. By 1828, ten mills were in operation, with more than 600 employees.¹⁵ Fourteen mills were running by 1832, for which the total water rentals came to \$10,329.50.¹⁶ As manufacturing exploded so did the population, with 1,098 counted in 1827, this total nearly doubling by 1831, and nearly doubled again, to 3,175 residents, by 1836. That year the assessor counted 541 dwellings in Manayunk—a far cry from the dozen or so found in the vicinity less than 20 years earlier. A writer in 1828 described the transformation in this way:

It seems comparatively but a few months since, in our favorite ramble along the banks of the Schuylkill, for half a dozen miles above the city, we were accustomed to meet with nothing more imposing than a gentleman's country seat, or an occasional farm house. To hear nothing save perhaps the heavy sound of a flail, wielded by some veteran thresher; or the clamourings of truant urchins, as they sported upon the bosom of our placid and romantic river. But now five miles from Philadelphia, where calm waters reflected only the stately chesnut [sic] or

¹² Hagner, p. 57-58.

¹³ Hagner, p. 56-57.

¹⁴ Hagner, p. 69.

¹⁵ “Extracts of an oration delivered at the Church in Manayunk, July 4, 1828, by Dr. J. A. Elkinton.” From Samuel Hazard, ed., *The Register of Pennsylvania*, Vol. 2, No. 1, July 19, 1828, pp. 14-15.

¹⁶ Samuel Hazard, ed., *Register of Pennsylvania*, v. 9, March 1832, p. 158.

nodding cedar, we have the broad shadow of the cotton factory, and the swift rushing of the water as it hurries away from the mill wheel. The whole scene is changed. A flourishing and populous village has risen up suddenly, and where we but lately paused to survey the simple beauties of the landscape, the sloping hills, the green woods, and the winding river, the eye is arrested by the less romantic operations of a manufacturing community, and the ear filled with the noise of ten thousand spindles...Six years ago, in a state of embryo, and comparative nothingness, no enterprising traveler sought the shores of the Schuylkill in this direction. Now we are becoming the wonder of the old, as well as of the new world. Rising up in a remarkable manner, we have received the appropriate and highly complimentary appellation, of the Manchester of America.¹⁷

In 1854 Manayunk became part of the consolidated City of Philadelphia, but the number of mills continued to expand. The increasing reliability of steam engines freed mill owners from their dependence on water-power; in Manayunk, this meant they could locate on the town side of the canal or even higher up the hill if they wanted to be safe from floods. Twenty four factories, including some of the largest textile mills in the city, were counted in Manayunk in 1850, with 38 in 1860 on the eve of the Civil War. Historian Philip Scranton has calculated that in that decade, the work force increased by two-thirds, from 1,966 to 3,225, capital investment in industry rose about the same, and value of the products these factories produced nearly doubled.¹⁸ By then Manayunk was one of the largest manufacturing towns in Pennsylvania, and it could be said that its fortunes had surpassed those of the canal and navigation system that had given birth to it.

Schuylkill Navigation: The losing battle with the railroad

In 1830, an anonymous writer in the Pottsville, Pennsylvania newspaper, probably the owner of a coal mine, expressed his frustration with the Schuylkill Navigation system in an open letter to the company's managers:

That your prosperity is identified with our increasing trade and population, cannot be doubted; yet the dependance [sic] on our part may soon cease to exist, as we have it in our power to establish another communication with Philadelphia for the transportation of our mineral product—an alternative to which it is to be feared we must eventually resort. A railway to Philadelphia would obviously supersede the use of a canal, and the period cannot be far distant, when urged by the obstacles arising out of our present channel, we shall undertake the accomplishment of this great work.¹⁹

It is odd to think that, in spite of such far-thinking views as those expressed above, when the Reading Railroad was first contemplated, the thought was to make it a passenger line, not to

¹⁷ “Extracts of an oration...by Dr. J. A. Elkinton,” p. 14-15.

¹⁸ Scranton, p. 246-247.

¹⁹ *Philadelphia Inquirer*, October 21, 1830 (reprinted from the *Miner's Journal*, Pottsville).

compete for the coal trade with the Schuylkill Navigation. But as railroad investors began to see how huge the coal trade was becoming, they realized that there was more than enough tonnage being mined to support multiple transportation channels.²⁰ Coal was so desired that, unlike other fuels, it was transported long distances overland, by wagon, from the mines to market in Philadelphia—a ninety-mile journey that was extraordinary when good roads in the interior of the country were a rarity. An 1820 report from the Navigation Company noted that sales could be made all along the line of the canal, from Pottsville to Philadelphia, once it was completed, and eventually Pennsylvania coal was shipped all over the world.

It also became clear that the railroad possessed definite advantages over the water-based navigation system. Few products were valuable and desirable enough to move over land with horses and wagons for eighty or ninety miles to market; anthracite coal, when it was first discovered, was one of them.²¹

Railroads rode on metal, iron and steel—strong, hard to bend, reliable, relatively unchanging and dependable; while the navigation boats floated on a sometimes fickle fluid—water that might be smooth and placid, but could at times race in a deadly torrent or dry up to a trickle, and which invariably froze solid in the wintertime. This 1844 newspaper notice is similar to many that appeared over the years: “We learn that the managers of the Schuylkill Canal contemplate opening the Canal for transportation, about the 15th of March, *should the weather permit* [italics added].”²² And this more poetic notice announced the closing of navigation in 1834: “Last Sunday was the coldest weather we have had this season, and the Schuylkill Navigation was suddenly closed. We heard the note of the boatman’s horn that was wont to peal so merrily, on Saturday evening, but the music, like that of Baron Munchausen’s, seemed frozen in the horn. On Monday morning, the Schuylkill was completely frozen over.”²³

In 1830 one company official estimated that the navigation system, when down times for dry weather, floods, and ice were taken into account, could operate about 240 days out of the year.²⁴ Damage from floods and freshets was an irregular but serious drain on the company’s coffers; one canal historian thinks that floods may have played an even greater role in the Navigation Company’s demise than competition from the railroads. This point is arguable, but

²⁰ *Philadelphia Inquirer*, December 5, 1889.

²¹ Smith, Edwin F. “The Schuylkill Navigation.” *Publications of the Historical Society of Schuylkill County*, Vol. 2 (Pottsville, Pa.: Daily Republican Print, 1910), p. 479-480. Smith wrote this paper in 1906, when he was general manager of the Schuylkill Navigation Company; he had also served as the company’s chief engineer.

²² *Philadelphia Inquirer*, March 4, 1844.

²³ *Pottstown Gazette*, as reprinted in the *Philadelphia Inquirer*, December 19, 1834.

²⁴ Joseph S. Lewis, president, Schuylkill Navigation Co., letter of December 16, 1830 reprinted in *Philadelphia Inquirer*, December 21, 1830, p. 2.

there is no argument that weather-related damage to infrastructure and the resulting downtime gave railroads a distinct advantage over canal transportation.

Downtime or not, until 1842 the Schuylkill Navigation enjoyed a monopoly in the transporting Schuylkill County coal, and the 1830s and early 1840s were its most profitable years. Even after 1842, when the Reading Railroad Company completed its line to the Schuylkill County coal fields, the canal's tonnage continued to increase. Profits shrank, however, because it had to reduce tolls to compete with those of the railroad.

In another move to increase its competitiveness, in 1846 Navigation underwent an expensive expansion, doubling the size of many locks to enable more boats carrying heavier loads to pass through the locks more quickly.²⁵ Maximum tonnage was reached in 1859, when about 1,400 boats with the capacity to carry 180 tons operated on the canal. "Notwithstanding this great increase in tonnage the canal was never able to overcome its financial difficulties," and to recover from the disaster which befell it," wrote one former company employee. Two floods in July and September 1850 caused great damage to the work, including the destruction of parts of 23 dams. While the canal was completely opened again by the following spring, the lost toll revenue and the cost of repairs were a great financial setback.²⁶

While the company never got out of debt, it held on until a tragic confluence of events in 1869 pushed it over the edge. First, strikes by coal miners cut into the tonnage and toll revenue; then a severe drought reduced water in the system to the point that boats had to carry lighter loads, further reducing revenue. Because of the drought, the City of Philadelphia pumped so much water out of the river at Fairmount that the locks at the dam there were impassable from July until heavy rains finally broke the drought on September 25. Navigation resumed on September 27, but on October 4 heavy downpours caused the worst flood ever recorded on the Schuylkill River.²⁷

With its infrastructure smashed and its money run out, the company leased its navigation system to the Reading Railroad—and if this seems a little like giving the fox the keys to the henhouse, it was. While the railroad kept the canal in repair, it eventually siphoned off most of the coal trade to the railroad side of the business. Several bankruptcies of the Reading Company in the 1880s and 1890s had little effect on the canal navigation; for better or worse, decline was the order of the day.

By 1910, some sections of the navigation closest to the coal mines were being abandoned, and others downstream were abandoned over the next thirty years as their

²⁵ Wells, p. 25-26.

²⁶ Smith, p. 495.

²⁷ Wells, p. 35-36.

infrastructure deteriorated and became unusable. Maintenance on some canal stretches ended, and without regular dredging both the canals and the river bed itself became choked with the coal dust that had flowed from the mines into the river for decades. The last coal had passed through the canal by 1917; the last commercial traffic by 1922. Pleasure boaters continued to use the sections of the canal into the 1940s, and to generate a little revenue, hydroelectric plants were established at some of the dams, with the Flat Rock Dam in Manayunk providing electricity for the Philadelphia Transportation Company.²⁸

“In 1945,” wrote Stuart Wells, “the segments of Schuylkill Navigation Company property located in or along the river were taken over by the Commonwealth of Pennsylvania as part of the Schuylkill River Desilting Project. Eighty-nine dams and locks were destroyed... most Schuylkill Navigation structures located in or along the river were either torn down or buried. Canal hardware and machinery, such as iron straps and cranks, were sold to scrap yards. The water no longer flowed the length of the Schuylkill Navigation as it had for so many years, and an important but little known chapter in the history of canaling and American transportation had closed.”²⁹

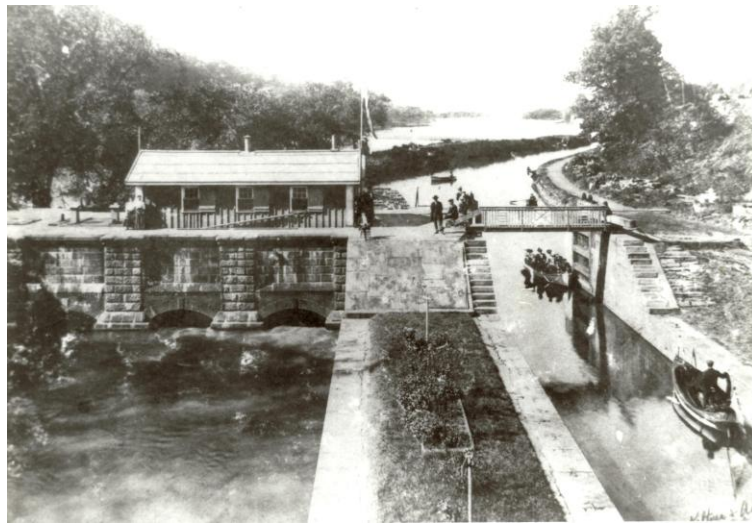
Canal transportation was, in most cases and certainly along the Schuylkill Navigation, transportation for a slower age. While it initially made the transportation of large quantities of heavy materials possible, and was able to transport large quantities of heavy materials in a fraction of the time needed to transport the same material over land, this advantage only lasted a couple of decades, until railroads – fed by the coal – made overland travel cheaper, more efficient, and a year-round affair. By the 1890s the roughly 1,500 boats that traversed the Schuylkill Navigation in its heyday had dwindled to less than 50, prompting Martin Gallagher, a long-time canal man, to muse to a Philadelphia newspaper reporter:

Coal is sent by railroad almost exclusively now, so you see that steam has almost killed the boating business. But take it all in all, when there is a living to be got out of it, the boating business is a very pleasant one, and independent. We have to work hard at times during loading and unloading, and when going through the locks, when it takes quick action and plenty of it, but after that there is nothing to do but steer the boat, smoke one's pipe and enjoy the lovely scenery, which at all times of the year is ever changing and ever beautiful.³⁰

²⁸ Wells, 42-44.

²⁹ Wells, p. 45.

³⁰ *Philadelphia Inquirer*, January 21, 1894, p. 21.



Early 20th century photographs of upper portion of Manayunk Canal showing the Sluice House and Lock 68.