

NAVIGATION ON THE UPPER POTOMAC RIVER AND ITS TRIBUTARIES

Second Edition

Dan Guzy



Published online by WHILBR – Western Maryland Regional Library

WHILBR
101 Tandy Drive
Hagerstown, MD 21740.
301-739-3250
email: whilbr@washcolibrary.org

<http://www.whilbr.org/>

© Dan Guzy 2011

This book is in copyright. No republication of any text or graphics may be made without permission of the author, Dan Guzy (e-mail: danguzy@yahoo.com).

Title page photo: The sluice at House Falls, on the Potomac River, five miles upstream from the mouth of the Shenandoah River. John Semple built a navigational sluice here in 1769 to enable transport of pig iron from his Keep Triste Furnace to the forge at Antietam Creek. The Potomac Company later maintained and likely improved the sluice as part of its overall river navigation system. The House Falls sluice is among the oldest river navigational structures still in use in the United States, if not indeed the oldest.

Except as noted, all photographs and graphics in this book were made by the author, Dan Guzy.

Contents

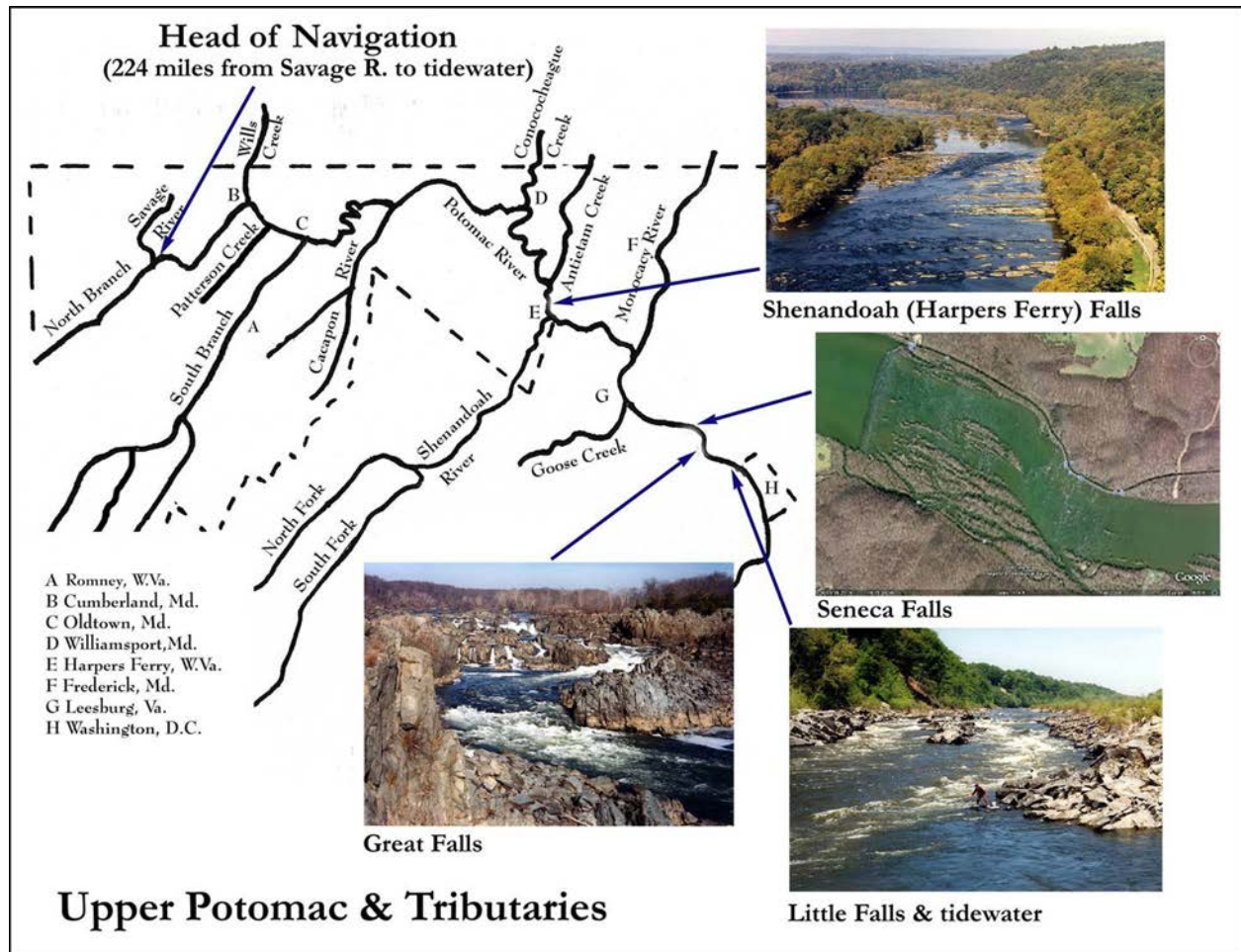
i	Title page
v	Foreword
vi	Acknowledgements

Chapters:

1	Colonial Navigational Schemes
9	The Potomac Company and Potomac River Surveys
22	Canals, Locks, Sluices and Fish Weirs
27	Boats, Cargos and Tolls
38	The North Branch
44	Between the South Branch and the Shenandoah River
53	Tributaries and the South Branch
69	Between the Shenandoah River and Tidewater
87	Conclusion

Appendices:

90	I. Report of Thomas Moore's 1820 Potomac River Survey
96	II. Potomac Navigation as Described in the Joint Commissioners' Report of their 1822 Survey
107	III. Descriptions of the Potomac Company's Major Works
113	References



Foreword

As we now look at the upper Potomac River, the part above tidewater, and see only the occasional bass boat, kayak and canoe, we may find it hard to realize that this was once a river of commerce. Nevertheless, before the Chesapeake and Ohio Canal, river boats sixty to seventy-five feet in length regularly plied these waters, carrying 100 barrels and more of flour, or other cargos.

Most published works discussing the Potomac Company (1785–1828) and earlier navigational schemes for the upper Potomac focus on their business and political aspects. This book will instead attempt to emphasize the history of navigation itself, that is, the history of routes, structures, boats, and cargos on the upper Potomac and its tributaries.

This book relied largely on scattered records, anecdotal accounts, and limited archeological evidence, which tell an interesting but incomplete story. The author hopes that this book will help inspire future researchers to fill in the gaps.

Acknowledgements

The first edition of this book was published and sold in printed form by the C&O Canal Association (C&OCA). Karen Gray of the C&OCA and Bill Trout of the Virginia Canals and Navigations Society made significant contributions to the first edition through their encouragement, reviews, and suggestions. The author appreciates the editing done then by Ned Preston and Dave Johnson of the C&OCA.

This second edition updated and expanded material in the first. It was made available on the internet by WHILBR – Western Maryland Regional Library. The author greatly appreciates the work of Jill Craig in editing and publishing this online.

Most importantly, the author must thank his wife, Kerren, for her patience and understanding those many times her husband drifted off into this river history project.

Colonial Navigational Schemes

The Potomac Company came after several other eighteenth century efforts to establish commerce through the Allegheny Mountains, into the Ohio and Mississippi River Valleys, and further on to the Great Lakes. The Indians had long before established land and river routes through the wilderness. As colonial entrepreneurs from the coastal plain first settled beyond the falls of eastern rivers and looked further west for their fortunes, they replaced Indian paths with packhorse trails and later wagon roads. However, overland roads in early America were difficult to construct, maintain, and use. Water routes promised to provide the most economical means of transportation.¹

The Potomac and Monongahela Rivers and their tributaries offered the potentially shortest water route from eastern seaports to the Ohio Valley. The upper Potomac's main stem and its North Branch flow in a generally easterly direction and have cut a surprisingly smooth water route through the mountain ridges east of the Allegheny Plateau. The four major rapids of the upper Potomac—Shenandoah, Seneca, Great and Little Falls—are in a stretch of 60 miles above tidewater that was conveniently next to the rising colonial population centers. This made getting labor and supplies for constructing bypass canals and sluices easier than if the rapids had been further off in the hinterlands.



Shenandoah (Harpers Ferry) Falls of the Potomac River—looking upstream. (D. Guzy)

Archeological sites all along the shores of the upper Potomac River reveal much prehistoric settlement. The Indians had largely vacated the upper river before and during the European contact period, but continued to use it as a water route for their hunting, war, and trade activities. Around 1700, some tribes established temporary villages there and were followed by fur traders. By 1730, Europeans were interested in establishing farms and plantations along and near the upper Potomac, but disputes over land ownership needed to be resolved.

A survey team explored the upper Potomac in 1736 to define and map Virginia's northern border. Because of the lack of roads, the team found their "horses would be troublesome to us and a great

hindrance to the business at hand,” so they built dugout canoes and paddled upstream. From the mouth of the Shenandoah River to what is now the Hancock area, they passed about thirty new homes as they slowly surveyed up the river. They found just two more homes (at the mouth of the South Branch) and only abandoned Indian sites along the rest of their way to the “first head or spring of the Potomack headwaters.” The Fairfax Stone would later be placed at this spot at the end of the Potomac’s North Branch. Canoes likely supplied the survey team as it moved upstream in the wilderness. However, the records only document one such delivery—of food and sixteen gallons of rum sent from Conococheague Creek to the surveyors at the mouth of Savage River.²



Great Falls—looking upstream from Virginia side. (D. Guzy)

The Ohio Company of Virginia was organized in 1747 to sell land in the Ohio Valley and to trade for fur with the Indians there. While Virginia’s colonial governor, Robert Dinwiddie, and the trailblazing Marylanders Thomas Cresap and Christopher Gist were important participants, the company’s membership was largely from families of Virginia’s Northern Neck—including the Lees, Masons, Mercers, and Washingtons—who lived along the lower Potomac River. Sons of these tidewater families sought to develop new plantations in the unsettled frontier, and hoped to profit from what commerce the upper river would bring. Members of these same families would later play key roles in the Potomac Company and its successor, the Chesapeake and Ohio Canal Company.

Established after European fur traders and farmers had already settled along the upper Potomac River, the Ohio Company was the first major commercial enterprise to attempt to exploit the river’s navigation. In a June 20, 1749 letter, some company members noted:

the most convenient Passage will be into Potomack River which is Navigable by the largest Ships within ten Miles of the Falls. The Company’s Store house at Rock creek where they may land and have their Goods secured is sixty miles from Conococheegee, a fine road from whence they may go by Water in the Company’s Boat to their Store house at Wills Creek about forty miles and from

thence the Company have cleared a Waggon Road about sixty miles to one of the head branches of the Ohio navigable by large flat bottomed boats where they propose to build Storehouses and begin to lay off their Lands.³

This letter implied that the Ohio's Company's boats would run only between Conococheague and Wills Creek. However, in a November 7, 1749 letter, Lawrence Washington—George's older half brother and one of the leaders of the company—talked about navigation down to what seems to have been Seneca or Great Falls: "the Potomack River is navigable for small Flats as high up as the Aligany Mountains except an obstruction of seventeen miles immediately above where the Tide flows." Similarly, an 1834 House of Representatives' report later recalled that the company's "goods, imported from Great Britain . . . into the town of Belhaven, now called Alexandria, were carried eighteen miles over land to the head of Great Falls of Potomac, and there transferred to barges, from which they re-landed at Cumberland [Wills Creek], after a voyage of one hundred and seventy-six miles."⁴

The Ohio Company of Virginia seems never to have fully developed trade with the Ohio Indians. However, its records show that it did much business with the Indian traders and farmers located along the upper Potomac.⁵

The company's trade and land development schemes conflicted with France's interests in the Ohio River Valley and led to war. The French and Indian War (1754–1763), settlement restrictions imposed by the Treaty of Easton (1758), Pontiac's Rebellion (1763–1764), and subsequent English grants to rival trade companies stifled further commerce of the Ohio Company of Virginia.



Little Falls—looking upstream. (D. Guzy)

A young surveyor for the Ohio Company, George Washington, would become a lifelong advocate for Potomac River navigation as the route to the West. In July or August 1754, just weeks after he led Virginian troops in skirmishes at Jumonville Glen and Fort Necessity that triggered the French and Indian War, Washington surveyed the Potomac. He canoed about 170 miles down the river from the mouth of Patterson Creek (about ten miles downstream from the fort at Wills Creek) to above Great Falls.

Washington likely had both military and commercial objectives in mind as he surveyed the river. He would later share his 1754 observations with others interested in promoting Potomac navigation.⁶

From his canoe survey, Washington concluded that the Potomac could be easily improved for navigation. "From the mouth of Paterson Creek to the [head of] Shannondoah Falls there is no other obstacle than the shallowness of the Water to prevent Craft from passing." Washington suggested "digging a Channel" and "removing some Rocks" at places along the Maryland shore to smooth the passage through the rapids at Shenandoah Falls (on the Potomac just above Harpers Ferry) and down through what is now the Knoxville area. It would then be easy going until the Seneca Falls, where he recommended that the land carriage to tidewater begin.

In January 1755, Horatio Sharpe, Maryland's colonial governor, and Sir John St. Clair, General Edward Braddock's deputy quartermaster general, took a similar trip in a dugout canoe to determine the river's navigability to the fort at Wills Creek. They reached a conclusion different from Washington's. After the trip, St. Clair wrote to Braddock that:

Navigation of the Pattowmeck is impracticable . . . for all other Vessells but Canoes cut out of a Single Tree; We attempted to go down the River in this Sort of Boat, but we were obliged to get on Shore and walk on foot especially at the Shannanodeau Falls. So that the getting Batteaus and Floats made for transport of the Artillery and the Bagage of the Regiments, cou'd serve for not other thing, but to throw away the Governments Money to no purpose, and loose a great deal of time.⁷

Governor Sharpe originally proposed that military supplies be carried by wagon from Rock Creek to Conococheague Creek, and from there boated upstream by batteaux to the fort. However, in a subsequent letter to Lord Baltimore, he agreed with St. Clair that "the many Falls & Shoals in that River . . . render the conveyance of Artillery & other Stores to the Camp by water impracticable." Consequently, Braddock's campaign march in the spring of 1755 used mainly overland routes to reach the fort at Wills Creek, which Braddock would soon rename as Fort Cumberland.⁸

However, Governor Sharpe later changed or clarified his opinion on Potomac River navigation. In an August 1756 letter, he noted that the location he chose for Fort Frederick "is so situated that [the] Potowmack will be always navigable thence almost to Fort Cumberland, the Flatts or Shallows of that River lying between Fort Frederick & Conegochiegh [Conococheague Creek]." That is, Sharpe then considered the long stretch between Cumberland and Fort Frederick as "always" navigable, whereas the shorter stretch downstream from Fort Frederick to Williamsport contained the major obstacles.⁹

In its unimproved state, the upper Potomac River saw some military service during the French and Indian War. The ill-fated General Braddock used the river to transport some part of his artillery, ammunition and provisions. Thomas Cresap is said to have used boats on the North Branch to transport flour and wheat to Fort Cumberland. In April 1756, while in command of Potomac area forts, George Washington ordered supplies from storehouses near the mouth of Conococheague Creek shipped up to Fort Cumberland by "Batteaus and Canoes."¹⁰

Governor Sharpe's attempt in July 1758 to ship supplies upstream from Fort Frederick to Fort Cumberland undoubtedly led him to recant his statement that the river stretch was "always" navigable, and illustrates the effect drought had on navigation on the upper Potomac River and its North Branch. Sharpe needed to transport musket balls and artillery shells to Fort Cumberland. He chose to transport the supplies by river because the road between the two forts was then still under construction. Sharpe noted the river levels in late June were too low for "Battoes" that could carry four to five tons. So instead he ordered that 10 to 14 (the number varied in different letters) canoes at Conococheague Creek be brought upstream to Fort Frederick. There Sharpe had the canoes loaded with the 20 tons of balls and shells.

Accompanied by 50 soldiers, the "canoe men" headed toward Fort Cumberland. As the already low river levels continued to fall another two inches, the heavily-loaded canoes became stuck in places and had to be dragged off. The boatmen abandoned their effort at Oldtown, where the supplies were unloaded and sent overland on the part of the road already built. When the boatmen returned with their canoes to

Fort Frederick, they told Sharpe that it would impossible to transport the rest of the supplies by river unless it rained.¹¹



Fort Frederick (D. Guzy)

At the end of the French and Indian War, interest in improving the Potomac as a navigation route for private commerce resumed. A notice in the February 11, 1762 *Maryland Gazette* solicited the Virginia and Maryland public to be subscribers in a scheme for “opening the River Patowmack and making it passable for Small Craft, from Fort Cumberland to the Great Falls . . . The whole Land-Carriage from Alexandria, or George-Town to Pittsburgh, will then be short of 90 Miles.” The Potomac plan was meant to beat out the rival Pennsylvanians “who at present monopolize the very lucrative Skin and Fur Trades,” but whose route required a portage of 300 miles to their seaports.

The proposed company would have Colonels George Mercer and Thomas Prather as treasurers along with 20 other “Gentlemen” appointed as managers. At least three of the managers listed had been members of the Ohio Company of Virginia and others were noted early settlers of the area—including Jonathan Hager, Benjamin Chambers and Evan Shelby. The notice also suggested the option of “opening or passing” Great Falls.

A follow-on piece in the June 10, 1762, *Maryland Gazette* stated that: “Subscriptions are filling very fast, and that People in general, but more especially in the Back Countries, and those bordering upon Patowmack, discover to much Alacrity in promoting the Affair, that there is not the least Doubt but a Sum will be raised, sufficient to carry on the work.” This article also noted that the managers would examine the river that month or in July, when they expected the lowest water levels.

The 1762 scheme to open commerce over the mountains was likely thwarted by violence in western Maryland during Pontiac’s War. However, as colonial settlers moved up the Potomac River and its tributaries in greater numbers, they looked again to the Potomac as the transportation route to bring their

iron and other goods to market. In the late 1760s and early 1770s, John Semple, John Ballendine, and Thomas Johnson—owners of colonial iron furnaces and forges in Maryland and Virginia—each developed plans for improving navigation on the Potomac.

John Semple's 1769 plan mentioned the potential for opening western trade and appears to be influenced by George Washington's 1754 Potomac River survey. As the owner of the Keep Triste Furnace at the mouth of Elks Run above Harpers Ferry, Semple was obviously most interested in getting his iron to market cheaply. His plan provided estimates showing that shipping pig iron from his furnace via the Potomac River would cost significantly less than relying on all-road transportation.

Semple, like Washington before, reported there were no obstructions between Fort Cumberland and the Blue Ridge Mountains "but want of water over Shallow places when the River is low in autumn and the latter end of Summer." Through the Blue Ridge Mountains and down to the head of Great Falls, Semple's plan called for a combination of dams with gates, canals with locks, and sluices to bypass rapids. But other than his sluice at House Falls, Semple saw none of his proposed works completed before he died in a debtor's prison in 1773.¹²



Sluice at House Falls—looking downstream from river. (D. Guzy)

Thomas Johnson, another iron maker (and later the first state governor of Maryland and a future president of the Potomac Company), offered the next navigation plan in 1770. He had voyaged down the Potomac from below Fort Frederick to Paynes Falls and concluded that only "Shepherds Falls" (the ledges below Shepherdstown) and House Falls posed mentionable difficulties upstream of Shenandoah Falls. To clear Shenandoah, Paynes and Seneca Falls, Johnson stated that building simple sluices and blowing away rocks with gunpowder was preferable to constructing canals with lift locks. Washington and the Potomac Company would later share the same preference. Like Semple's plan, Johnson's would have portages to tidewater begin above Great Falls.

Thomas Johnson sold private subscriptions for his plan and, with George Washington's help, influenced the Virginia Assembly to pass in 1772 an act "for opening and extending the Navigation of Potowmack from the Tidewater to Fort Cumberland." However, Johnson failed to pass a similar act in his own state, due to opposition from Baltimore merchants who feared that opening up-river trade to Georgetown would hurt their businesses.¹³

John Ballendine, erstwhile partner of John Semple, would propose the most elaborate Potomac navigation scheme in colonial times. Ballendine envisioned an all-water passage on the Potomac from tidewater to Fort Cumberland, with no portages. In addition to clearing rocks in the river, his plan called for bypass canals with locks at Little, Great, Seneca, Shenandoah, House, and Antietam (Shepherdstown?) Falls. The Potomac Company would later resort to locks at only Great and Little Falls.¹⁴

George Washington, a confidant of Semple, Johnson, and Ballendine, noted the latter's "natural genius" but was wary of his "loose Principles." Despite his reputation for debt and corrupt business practices, John Ballendine persuaded Washington, Johnson, and several other prominent Virginians and Marylanders to sponsor his trip to England in 1772 to study canals and locks. While there in 1773, he developed a proposal for trade routes connecting the Potomac and Monongahela Rivers, and the James and Kanawha Rivers. He boldly predicted that his river improvements would allow "barges of at least fifty tons burden" to "pass loaded up and down the said rivers." In a separate advertisement from London that year, Ballendine predicted that eventually barges of 150 and 200 tons would be used. (By contrast, the boats actually used on the river during the Potomac Company's operation typically held between 10 and 20 tons of cargo.)¹⁵

When Ballendine returned to the Potomac River in late 1774, he held public meetings with his trustees to drum up more support. In early 1775, with slaves and skilled English canal workers, Ballendine began excavating a canal on his land on the Maryland side of Little Falls. However, "pecuniary embarrassments" and legal problems forced him to abort this Potomac work. In an October 1775 announcement, Ballendine blamed the Maryland assembly for failing to pass an act similar to one passed in Virginia, and declared he would employ his "time and attention in opening and extending the navigation of [the] James river." He advertised for 100 slaves for his James River effort, whereas he had advertised for just 50 for the one on the Potomac. By June 1775, Ballendine had transferred his entrepreneurial efforts in canal building and iron making to the James River, where he would die in 1781. The Potomac Company would later build over and extend Ballendine's canal at Little Falls.¹⁶

A common link between all the colonial navigational schemes for the upper Potomac River was George Washington's involvement. Although the Revolutionary War (1775–1783) delayed further development, Washington would personally rekindle interests and lead Potomac navigational efforts as soon as he had returned to being a private citizen after the war.

¹ See Charles A. Hanna, *The Wilderness Road* (1911, reprinted in 1971 and 1995) for accounts of Indian routes.

² Elizabeth Cometti, "Concerning the First Survey of the Northern Neck," *West Virginia History*, Vol. 2, No. 1, October 1940, pages 60–63. Benjamin Winslow's field notes (Mss11:3 W7326:1) at the Virginia Historical Society. William Byrd (in "The Proceedings of the Commissioners Appointed to Lay out the Bounds of the Northern Neck, Lying Between the Rivers Potomac and Rappahanock, Anno. 1736") joked about one of the surveyors, John Savage, being blind and useless, and that the starving survey team threatened to eat him during their wait for supplies at the mouth of the Savage River. This tall tale of threatened cannibalism is similar to another Byrd made about his earlier survey of the Virginia/North Carolina border, but some historians have mistakenly taken it as a Savage River fact.

³ June 20, 1749, letter signed by James Scott, George Mason and J Mercer, reprinted in Lois Mulkearn, *George Mercer papers relating to the Ohio Company of Virginia*, Pittsburgh, University of Pittsburgh Press, c1954, page 146. The Ohio Company also constructed a temporary storehouse at Thomas Cresap's plantation at Oldtown until the Wills Creek storehouse was completed, sometime before May 1751 (Ref. *George Mercer papers*, footnote 182 on page 507 and footnote 548 on page 619).

⁴ Moncure Daniel Conway, *Barons of the Potomack and the Rappahannock*, 1892, page 272. Charles F. Mercer, "Chesapeake and Ohio Canal," *House of Representatives Report No. 414 for the 23rd Congress, 1st Session*, page 2. In 1828, Mercer gave a similar account published in *House of Representatives Report No. 47 for the 20th Congress, 1st Session*, on page 24, in which he cited Ohio Company "boats" rather than "barges."

⁵ Alfred P. James, *The Ohio Company – Its Inner History*, Pittsburgh, 1959, pages 36, 39, 43, 51, 54 and 56.

⁶ Kenneth P. Bailey's *The Ohio Company of Virginia* noted that Washington surveyed the road from the Potomac to the Monongahela for the Ohio Company. In addition, Washington surveyed in the regions of Fifteen Mile Creek and Great and Little Cacapon Rivers. Washington's 1754 "notes on navigation" exist now in several collections and in several forms, including the original draft, separate letters to Thomas Lee and Charles Carter in August 1754, and in 1762 as material included in letters to Thomas Johnson and "a Participant in the Potomac River Enterprise" (George Washington's papers). The letter to Lee, a member of the Ohio Company, might imply that Washington's Potomac River assessment was for company business purposes. However,

his letter to Johnson suggests there was a military purpose as well. “Washington’s Canoe Trip Down the Potomac Related in a Letter to Colonel Innes” (*Records of the Past*, Vol. IX, 1910, pages 74-79) said James Innes, commander of North Carolina troops at Wills Creek, was another addressee for the notes and stated that the canoe trip began at Wills Creek. If the latter was indeed true, one wonders why Washington failed to mention navigational conditions between Wills and Patterson Creeks.

⁷ February 9, 1755, letter from Sir John St. Clair to Major General Braddock, reproduced in Stanley Pargillis, *Military Affairs in North America 1748-1765*, Archon Books, 1969, pages 62-63

⁸ December 10, 1754, letter from Sharpe to Virginia Governor Dinwiddie and March 12, 1755, letter from Sharpe to Lord Baltimore in *Calvert Papers*, Vol. 6, *Correspondence of Gov. Sharpe 1753-1757*, pages 140 and 186.

⁹ August 21, 1756, letter from Sharpe to Calvert (Archives of Maryland, Volume 6, *Correspondence of Governor Sharpe, 1753-1757*, page 466).

¹⁰ John Semple’s “Proposals for Potomac Navigation” (Grace L. Nute’s “Washington and the Potomac: Manuscripts of the Minnesota Historical Society,” for the *American Historical Review*, 1923, pages 499-500) mentioned Braddock’s use of the Potomac River. William H. Ansel, Jr.’s *Frontier Forts along the Potomac and Its Tributaries* (Parsons, W.Va., 1984, page 58) noted an attempt by Thomas Cresap of Oldtown to recover his French and Indian War shipping expenditures in a suit filed against Thomas Walker in 1764. Letters to Lieutenant Colonel Adam Stephen, April 7, 1756, and to Captain David Bell, April 8, 1756 (George Washington’s papers).

¹¹ Archives of Maryland, Volume 9, *Correspondence of Governor Sharpe, 1753-1757*, pages 214-230.

¹² John Semple’s proposal(s) is in Nute, pages 499-505 and also in W.W. Abbot’s *The Papers of George Washington*, Vol. 8, pages 284-291.

¹³ Edward S. Delaplaine, *The Life of Thomas Johnson*, New York, 1927, pages 67-72. Johnson and Lancelot Jacques were partners in the Green Spring Furnace, just below Fort Frederick, which explains why Johnson’s Potomac voyage began there. Johnson’s plan is in Nute, pages 505-515.

¹⁴ A printed copy of Ballendine’s *An Estimate of the Expence in Removing the Obstructions in Potowmack River from Tide-water to Fort Cumberland* is in the miscellaneous accounts of the Potomac Company records.

¹⁵ George Armroyd, *A Connected View of the Whole Internal Navigation of the United States*, 1830, pages 209-213. “John Ballendine—Unsuccessful Entrepreneur of the Eighteenth Century,” *Virginia Cavalcade*, Spring 1959. Arthur G. Burton’s and Richard W. Stephenson’s “John Ballendine’s Eighteenth-Century Map of Virginia,” reprinted from *Quarterly Journal of the Library of Congress*, July 1964.

¹⁶ Dan Guzy, “The Potomac Company’s Canal and Locks at Little Falls,” *Maryland Historical Magazine*, Winter 2001, pages 423-424. November 3, 1774, January 7, 1775, and October 25, 1775, editions of the *Virginia Gazette*.

The Potomac Company and Potomac River Surveys

The Potomac Company

In 1781, Thomas Jefferson's *Notes on the State of Virginia* summed up the status of navigation on the upper Potomac River. In the first 15 miles above tidewater, the Little, Great, and Seneca Falls remained obstacles. Upstream of those lower rapids, navigation "for batteaux and canoes, is so much interrupted as to be little used. It is, however, used in a small degree up the Cohongoronta branch [the Potomac's main stem and North Branch] as far as Fort Cumberland, which was at the mouth of Wills's creek, and is capable, at no great expence [sic], of being rendered very practicable." In other words, the upper Potomac then saw limited commerce, but with some improvement could see much greater use.¹

With the peace following the Revolutionary War, interests in western development and river navigation renewed. Leaders of the new United States wanted to better connect the lands and citizens on both sides of the Allegheny Mountains. They feared that the Northwest Territories might be lost to Great Britain or Spain unless transportation and commerce with the eastern seaboard were improved. The Spanish increased the need for east-west routes by first closing the Mississippi River to Americans in 1784 and then charging large duties on goods when they reopened it.²

The states competed with each other over the western trade. New Yorkers planned to improve the Mohawk River to link the Great Lakes with the Hudson River and New York City. In Pennsylvania, the Union Canal would connect Philadelphia to the Susquehanna River in the middle of the state. (In the nineteenth century, systems of canals, railroads and inclined planes would cross all of Pennsylvania.) Mid-state Virginians hoped that improvements to the James and Kanawha Rivers would serve to open Ohio Valley trade to Richmond and the Virginia tidewater. Marylanders and Northern Neck Virginians looked to the Potomac and Monongahela Rivers as linking Georgetown and Alexandria to Pittsburgh, the Ohio River, and beyond.

The Hudson–Mohawk and the Potomac–Monongahela routes were the most promising. While the former, the New York route to the West, was longer, it crossed lower elevations than routes going through the southern mountains. (When completed in 1825, the Erie Canal would extend this route to Lake Erie and help establish New York City as the nation's greatest trade center.) The Potomac–Monongahela route would need to cross much higher elevations over the Allegheny Plateau; however it offered the shortest route from tidewater to the Ohio River valley.

On May 31, 1783, the Maryland legislature appointed Normand Bruce and Charles Beatty to examine the upper Potomac River and estimate the time and expense for making it "navigable through several falls." On November 15, 1783, they reported back with a plan intended to make the Potomac navigable from Fort Cumberland to tidewater. This included removing rocks and erecting dams in the river "to deepen and confine the water and check the rapids." A mile-long canal with two locks would be built along the Virginia side at Shenandoah Falls. At Seneca Falls they would deepen the channel along the Virginia shore and erect a dam to water it. A mile-long canal with eight locks would be built on the Virginia side of Great Falls. And a three-mile-long canal with four locks would be made on the Maryland side of Little Falls. Bruce and Beatty very optimistically estimated that these works could be completed in two years at the total expense of \$92,000. The Maryland legislature took no further action then.³

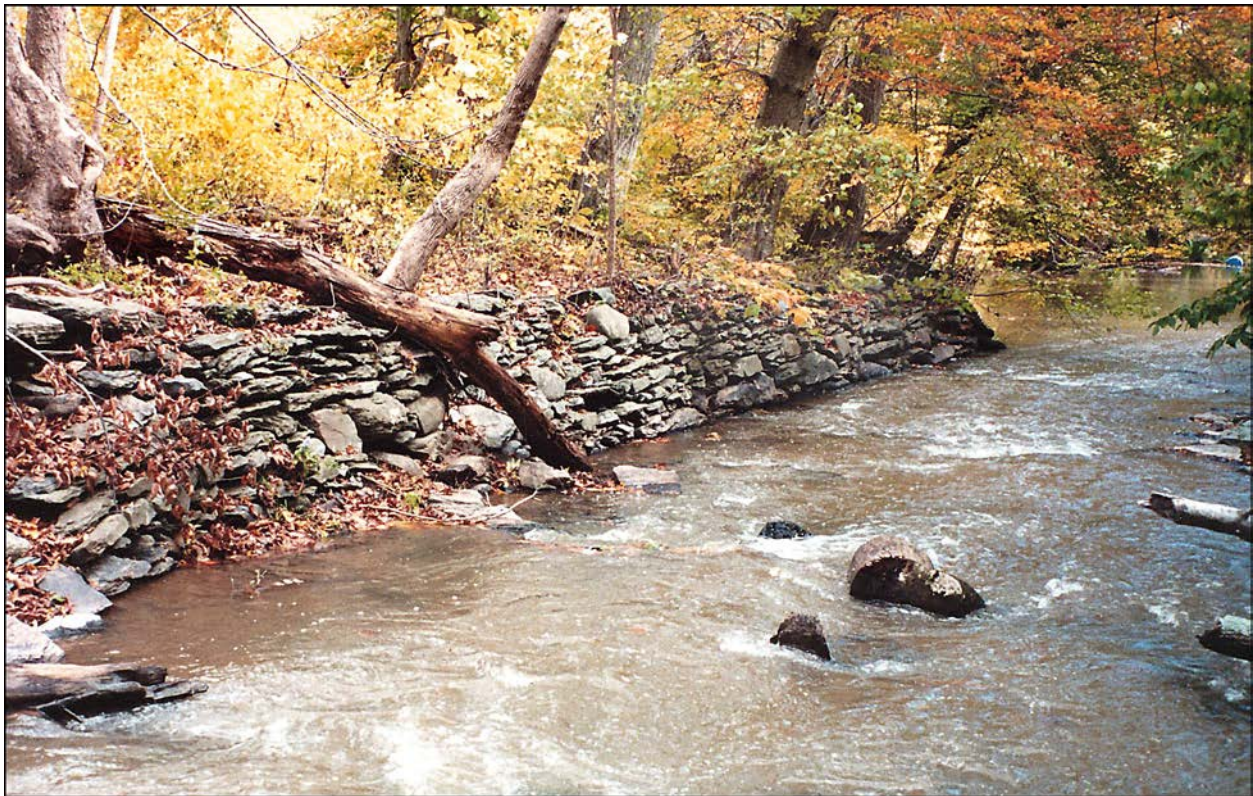
In September 1784, after returning to civilian life, George Washington journeyed to western Pennsylvania with his nephew Bushrod Washington, Doctor James Craik and his son, William, and three "servants." Washington wrote that his trip's objective was to check on and settle affairs on a mill he co-owned at Washington's Bottom (Perryopolis, Pa.). However, this trip was also meant to gather information on land and water trade routes. In his diary and subsequent other documents, including a very detailed letter to Virginia Governor Benjamin Harrison, Washington outlined his vision for trade routes from Detroit and the Great Lakes to Alexandria at the Potomac tidewater.⁴

Washington considered both the Youghiogheny and Cheat Rivers as possible navigational connections to the Monongahela, but seemed to prefer the latter. An option the Cheat posed was that instead of turning downstream at its mouth, toward Pittsburgh, one might go upstream on the Monongahela and its West Fork, portage to the Little Kanawha River, and then boat downstream to the Ohio River. That route would include only a very few miles within Pennsylvania, an attribute desired by Virginians. Washington's preference for a Cheat River route is presumably why it, and not the Youghiogheny River, was later mentioned in the Potomac Company's charters.

With Washington's influence, the Maryland and Virginia legislatures chartered the Potomac Company in 1784 and 1785. The charters allowed the company to condemn land along the Potomac River to build its navigational works, and to collect tolls on boat cargos so that it could pay off debts and reward investors. George Washington would serve as the company's first president from 1785 to 1789.⁵

The Potomac Company's charters stated that it should make the river navigable for "vessels drawing one foot of water" to a place on the North Branch above Cumberland "at which a road shall be set off to the Cheat River." The charters gave the company three years to make the Potomac River navigable from Great Falls to Cumberland, and ten years to make it navigable from tidewater though Great Falls. However, the Potomac Company would take seventeen years to complete its initial major navigational works. As will be discussed further, the company's failure to satisfy the one-foot-depth navigational requirement on the upper stretches of the river during the dry seasons of the 1820s would lead to its demise.⁶

In August and September of 1785, Washington and the Potomac Company directors personally inspected the Potomac River from Elks Run, above Harpers Ferry, to Little Falls. Undaunted by what whitewater paddlers now designate as Class I to III rapids, they canoed through all river stretches except the large cataracts at Great and Little Falls. Their observations and conclusions made during these canoe trips would serve as the basis for the company's initial work.⁷



Midsection of Seneca Falls sluice—looking downstream from Virginia shore. (D. Guzy)

The company first began building bypass canals without locks along the Virginia shore at Seneca Falls, and along the Maryland shore at the Shenandoah Falls on the Potomac River above Harpers Ferry. Labor problems, heavy rains, and high water levels slowed progress. However, these bypass canals and other works nearby were sufficiently completed by January 1790 for Thomas Johnson, then the company president, to officially state: "Inland navigation is now constantly performed by Batteaux of ten tons burthen and upwards, from East Cumberland, and a considerable distance within the South Branch to the Great Falls, within nine miles of Tide water, the boats returning on an average of twenty miles a day."⁸

While its initial focus was clearly on opening the Potomac River from the Blue Ridge Mountains to tidewater, the Potomac Company realized that it must assure navigation on the river's upper stretches through the Great Valley and the Allegheny Mountains, and on its major tributaries. It also needed to establish a land and water route over the Allegheny Plateau and on to the Monongahela River.

In 1786, a survey by Colonels Francis Deakins and John Neville concluded that the overland road should start on the North Branch at the mouth of the Savage River and continue through the upland glades to Dunkards Bottom (near present day Kingwood, W.Va.), but not stop there. Unlike Washington, the colonels observed that the stretch of the Cheat below Dunkards Bottom and through Laurel Hill was too rough for navigation in its unimproved state (so rough that today this Cheat River stretch is a whitewater rafting mecca). Deakins and Neville recommended that the road continue on to the Monongahela River at Morgantown.⁹

In July and August 1789, Colonel George Gilpin and James Smith surveyed the upper Potomac River and the potential water and land routes through the Allegheny Plateau. Gilpin was a surveyor from Alexandria, one of the Potomac Company's directors, and Washington's friend and confidant. Smith was then the Potomac Company's "principal manager."

Gilpin and Smith traveled the Potomac and its North Branch by boat, from Great Falls to twelve miles above Cumberland. Moving overland from there, they concluded that the North Branch would have been navigable as far upstream as New Creek (Keyser, W.Va.) for a boat with "thirty to forty barrels of flour." Their overall assessment of the upper Potomac was similar to Washington's. "After passing the Falls at the mouth of the Shenandoah river, we found no fall which would prevent a boat passing up and down with ease and safety, except in those seasons when the river is very low, then in the broad parts the water is shallow, and requires to be collected and deepened in those parts which does not appear either difficult or expensive to accomplish."¹⁰

Gilpin and Smith considered two routes between the Savage and Monongahela Rivers to be viable—a portage to Dunkards Bottom and then down the Cheat River, or a shorter portage to Deep Creek and then down that creek and the Youghiogheny River. They recognized that falls in both the Cheat and Youghiogheny Rivers posed navigation problems, but expressed optimism in overcoming them. These two potential routes would be reevaluated again and again as later surveys tried to determine the best trans-mountain canal extension from what would become the Chesapeake and Ohio Canal.

On his return trip down the Potomac, Gilpin noted the river commerce already in effect. "Two boats came down from Old Town with tobacco, two or three from Opeckon [Opequon Creek] with flour; and we went in the company with two or three from Shepherd's town; one of which was more than seventy feet long and when fully loaded, would carry from 120 to 130 barrels of flour; these boats went quite down to Great Falls; and I was informed by Captain Shepherd, that one thousand barrels of flour had been sent down the river this spring from Shepherd's town only."¹¹

Gilpin and Smith's survey and "leveling" of the river would serve the Potomac Company and future surveyors for years to come. The accompanying table presents the summary of their levels (i.e., elevations). In 1790, company president Thomas Johnson summarized the optimistic conclusion from Gilpin and Smith's survey: "These gentlemen have no doubt that navigation will be extended to the mouth of the Savage & think it may at considerable expense be connected with the western waters, several of which they visited and examined."¹²

Summary of Levels from Gilpin and Smith's 1789 Survey
(House of Representatives Report No. 111, 17th Congress, 1st Session, May 3, 1822)

“The different falls in the Potomac river leveled, and the distance of the river surveyed, by Col. George Gilpin and James Smith, in July and August 1789, beginning at the mouth of Savage, to Shenandoah falls; and from Shenandoah falls to tide water, below the Little falls, by James Smith, at sundry times.”

	Distance			Fall	
	Miles	¼ M	Perches	Feet	Inches
From the mouth of Savage to the mouth of Georges creek	2		63	61	5½
mouth of George's creek, to the mouth of New creek	5	3	50	129	2½
mouth of New creek to Fort Cumberland	22	1	60	254	4
From Fort Cumberland to Ewit's creek	4	2	5	34	2
Ewit's creek to the road on the river side from Cumberland	7	0	39	33	3
where Cumberland road joins the river to Patterson's creek	1	2	27	6	0
Patterson's creek to Mr. William Moore's	2	3	7	15	0
Mr. William Moore's to Mr. Joseph Sprig's of Old Town	4	0	49	11	9
Joseph Sprig's to the mouth of the South Branch	1	3	15	6	1
mouth of the South Branch to Town creek, or Gregg's	2	2	44	13	7
Gregg's to Mathias Brant's	4	0	77	25	½
Mr. Brant's to the lower end of the Tumbling Dam falls	6	3	41	35	1
Tumbling Dam falls to the lower end of Bear falls		3	32	00	0
lower end of Bear falls to David Mitchell's house	4	1	72	16	6
David Mitchell's house to Washington's bottom	5	3	42	23	1½
Washington's bottom to 15 mile creek	4	3	30	13	11
15 mile creek to Sideling hill creek	4	1	39	14	1½
Sideling hill creek to Great Cape Capron	2	2	10	13	6½
mouth of Great Cape Capron to Little Canolaway creek	8	0	67	27	9½
Little Canolaway creek to Hancock town		2	3	00	6
Hancock town to Great Canolaway creek		3	4	00	0
Great Canolaway creek to Licking creek	6	0	48	24	6
Licking creek to opposite Fort Frederic, or Back creek	4	1	24	17	6
Back creek to the lower end of Garrison's falls	1	1	36	4	10
lower end of Garrison's falls to Boyd's ferry	1	0	48	0	0
Boyd's ferry to the mouth of Little Conogochegue	6	2	6	23	2½
Little Conogochegue to the mouth of Great Conogochegue	5	3	24	25	1
mouth of Great Conogochegue to mouth of Opicon	8	3	8	48	3½
mouth of Opicon to Shepherdstown	17	1	24	35	9
Shepherdstown to the head of the Shenandoah falls, just below Cape Trist furnace	10	0	52	22	2
Head of Shenandoah falls to the lower end of island at Paynes falls	5	1	53	43	1¼
Island at Paynes falls to Senaca falls	32	0	8	13	9½
Head of Senaca falls to Broad run	2	1	19	15	0
mouth of Broad run to head of Canal at Great falls	5	3	26	9	9
fall at the Great falls				76	9
Head of canal at Great falls, to the head of the canal at Little falls	9	2	36½	29	4
fall at the Little falls				37	1
length of the canal at Little falls	2	2	75¼		
[Total]	218	0	63¾	1160	7¼

Table Notes:

1. Distance in miles, quarter miles (1/4 M.) and perches. 80 perches = 1 quarter mile
2. Using the US Geological Survey's (USGS's) river mileage cited for the locations of its river gages, the river distance from the mouth of the Savage River to the Washington D.C., line is about 223 miles. Lock Cove is about 1.4 miles below the D.C. line. So the total of 218 miles 63.75 perches measured by Gilpin and Smith is only 2.5% less than modern measurements.
3. The USGS river gage at Luke, Md., .2 miles downstream from the mouth of the Savage River, is 944.22 feet above sea level. The total fall of 1160 feet 7¼ inches measured by Gilpin and Smith is 23% greater than this elevation.

The Potomac Company completed its canal and three wooden locks at Little Falls in 1795. This opened navigation through to tidewater, with the exception of a portage around Great Falls where the canal and locks were still under construction. In July 1799, the president and directors of Potomac Company announced improved navigation on the Potomac: “from Georges Creek, twenty-eight miles above Fort Cumberland, and two hundred and eighteen above tide water, into tide water; which at this time, is in such a state, that at certain seasons, boats loaded with an hundred barrels of flour and upwards, can safely navigate that whole extent, except five hundred feet at the Great Falls.”¹³



Remains of the Great Falls Locks 3, 4 and 5 (D. Guzy)



Wall along Virginia shore for Seneca sluice (D. Guzy)

With the completion of the Great Falls locks in 1802, the Potomac Company finished its initial works, that is, those originally planned by George Washington and the directors in 1785. At their January 1802 meeting, the company’s president and directors proudly proclaimed: “after the approaching frost no obstacle on any part of the main River will remain to the free and safe transportation of the Produce of the upper country, from Georges Creek to tidewater markets, a distance of more than two hundred miles . . . [We] confidently expect that in the course of a very few years it will be so far improved as to admit to free passage of loaded boats at almost all seasons.” Adding to the optimism, the Potomac Company paid its first (and only!) dividend to its shareholders in 1802.¹⁴

At the start of the nineteenth century, the Potomac Company turned its efforts toward opening navigation on the Potomac’s tributaries. The company opened up stretches on the Shenandoah and Monocacy Rivers and Conococheague Creek, and attempted to do so on Antietam Creek.

In 1808, the Potomac Company’s response to the secretary of the U.S. treasury’s, Albert Gallatin’s, request for information on the nation’s “internal improvements” stated that the company’s greatest mistakes were constructing the Little Falls locks too large and using wood for their lock seats. (The Potomac Company used stone for all its other lock seats.) By 1812, the Little Falls three wooden locks were “much decayed.” About 1815 they “gave way, in such a manner that it became necessary to renew them entirely.” The company began quarrying stone for replacement locks as early as 1802. In 1812, it condemned land for the new locks upstream of the old wooden locks and began work. However, this had

to be temporarily suspended in 1816 due to lack of funds. The new set of four stone locks was finally opened in March 1818.¹⁵

Along with its aborted efforts to open navigation on Antietam Creek, the new Little Falls locks were the last major projects the Potomac Company attempted. The expense of Little Falls locks drove the company further into permanent debt. After 1818, its operations chiefly involved maintenance, and even that had to be carefully prioritized. Lock gates, wing dams, and in-river sluices frequently needed repairs. And the canals, locks and sluices had to be cleansed of the mud and other sediment that filled them.¹⁶

Later chapters will discuss in more detail the Potomac Company's navigational works on individual river stretches and tributaries.



Little Falls Canal entrance, later a feeder canal for the C&O Canal; now a whitewater slalom course—looking upstream.
(D. Guzy)

Potomac River Surveys

The building of the Erie Canal (1817–1825) threatened to take western trade away from Maryland, Virginia, and the new District of Columbia. This renewed interest in connecting the Potomac and Ohio Rivers by a canal over the mountains. It also created the desire to replace the Potomac Company's in-river navigation system with the region's own continuous, still-water canal—a canal built entirely off the river and relying extensively on locks, like the Erie Canal. Several surveys for a new continuous "Potomac Canal" were conducted in the 1820s. The optimistic conclusions of these surveys about still-water canals led to the end of in-river navigation on the Potomac, and to the Potomac Company itself.

Thomas Moore, a Quaker from Brookeville, Md., led two of the Potomac canal surveys in the early 1820s. Apparently self-taught, Moore was a scientific farmer, businessman, inventor, surveyor, and had served as an engineer on the National Road. John Mason befriended Moore and hired him to direct the construction of the causeway connecting Mason's summer home on Analostan Island (also called Mason's and now Theodore Roosevelt Island) with the Virginia shore. When the Virginia Board of Public Works was seeking a principal engineer in 1818, Mason, then the Potomac Company president, recommended Moore. The Board offered Moore the position and he accepted.

As he noted in a letter that year to his brother-in-law, Isaac Briggs, Thomas Moore was comfortable with the surveying aspects of the principal engineer job, but admitted his knowledge of river improvements at that time was limited. Nevertheless, Moore, with Briggs' assistance, was soon surveying and planning canals along the James and other Virginia rivers for the Board. Briggs had a little more experience as the engineer on the Rome to Utica section of the Erie Canal.¹⁷

In an attempt to improve its funding situation with the Virginia legislature, the Potomac Company resolved during its August 1819 annual meeting to request that the Virginia Board of Public Works have its principal engineer (Moore) examine their navigational works and explore the country laying between the Potomac and Ohio Rivers "with a view to find the best manner to improve navigation." The Virginia Board of Public Works agreed to fund this survey.¹⁸

In June 1820, Thomas Moore was "taking the levels of the Monongahela River" and making arrangements to get a skiff at Westernport to boat down the Potomac River. He began his "examination" at the mouth of Savage River on June 30th, continuing downriver from Cumberland on July 10th.¹⁹

Appendix I contains the report from Moore's 1820 survey. Moore concluded that canal and sluice improvements were practical for both the Cheat and Youghiogheny routes. He also noted how a tunnel might be used for the latter. For the Potomac River, Moore presented both cost estimates for improving existing in-river navigation and for a new continuous canal. He noted the limitations for further river improvements on the North Branch, but concluded that improvements totaling \$18,000 to \$20,000 would enable "boats carrying 100 barrels of flour [to] descend the river at all times, from the mouth of the South Branch to tide water, except for in an unusually dry season." Without "a minute examination on [the Potomac] shore," but based on his experience with the James River canal, Moore roughly estimated the cost of an continuous canal along the Potomac from Cumberland to Great Falls to be \$1,114,300. Thus, while recognizing the navigational superiority of a continuous canal over improvements to the Potomac Company's in-river navigation system, Moore estimated the cost to be more than 50 times greater. He left the ultimate cost/benefit decision for further river improvements versus new continuous canal construction to others.²⁰

In 1822, the District of Columbia Committee of the House of Representatives took Moore's 1820 survey information and recommended that a continuous still-water canal be constructed from tidewater to Cumberland. The committee recommended that the Potomac Company build the new canal. It proposed a scheme raising \$2.5 million between the U.S. government, the states of Virginia and Maryland, and individual subscribers to pay for new canal construction, and also to pay off the Potomac Company's existing debts.²¹

However, as shareholders in the Potomac Company who saw only constant debts, not dividends, the states of Virginia and Maryland wanted another survey and a new analysis of the Potomac Company's finances and capabilities. The new study would have a joint commission of "men of high standing and residing in the vicinity of the waters of the Potomac" to accompany Thomas Moore and issue a more detailed report. In January and February of 1821, the Virginia and Maryland legislatures appointed joint commissioners, and the Virginia Board of Public Works directed Thomas Moore to again examine the Potomac Company works and explore the country between the Potomac and Ohio Rivers.²²

William Naylor, Moses T. Hunter, and William Temple Thomson Mason were the three Virginians appointed to the joint commission. Naylor and Hunter were both attorneys and politicians, respectively from Romney and Martinsburg (now West Virginia). Mason lived at Temple Hall, near Leesburg, Va. and was the first cousin of Potomac Company president John Mason.

Colonels Elie Williams and Athanasius Fenwick were the Marylanders on the joint commission. At 73, Elie Williams was the oldest member of the survey party. He had served in the Revolutionary War and had assisted his brother, General Otho Holland Williams, in the founding of Williamsport. Williams had also been a Potomac Company president (1814–1817) until he had to temporarily flee to Kentucky due to debts, and was succeeded by John Mason. Athanasius Fenwick was a resident of Saint Mary's County, Md., and had soldiered in the War of 1812. While the states of Virginia and Maryland may have wanted the new navigation study to have been independent, one must note that the engineer and two commissioners had strong ties to the Potomac Company or its president.²³



Thomas Moore (courtesy of Sandy Spring Museum)



Elie Williams (courtesy of Williamsport, Md. library)

As they stated in their report, the joint commissioners' assignment was to examine: 1) the affairs of the Potomac Company; 2) the state of navigation on the Potomac River; 3) the river's susceptibility to improvement; and 4) whether the company had complied with the terms of its charters with Maryland and Virginia (particularly whether boats of 1-foot draft could navigate the river in the dry seasons). The survey was supposed to begin in 1821, but was delayed due to some "informality" in one of the state's appointment process, Moore's commitment to survey the Roanoke River first, and probably the difficulty of getting together busy men living distances apart.²⁴

The joint commissioners first assembled in Georgetown on July 2, 1822, to examine "the affairs of the Potomac Company." On July 5th, they formally issued a letter to company president John Mason asking for details on stock shares, expenditures, debts, and tolls. Mason transmitted this information to them on December 20th, and it was later published as appendices to the joint commissioners' report.

After Georgetown, the commissioners next traveled to Cumberland, where Thomas Moore joined them on July 15, 1822. From Cumberland, the survey party inspected the Potomac's North Branch up to the mouth of Savage River, and from there "the connection between the western and eastern waters." The joint commissioners' report did not describe these first parts of the survey in any detail. Unlike Moore's earlier report, it did not mention the condition of navigation upstream of Cumberland. While asserting that there would be sufficient water supplies at summit levels for a canal up the Savage River and Crabtree Run and then down Deep Creek to the Youghiogheny River, the report did not describe the structures or route of this proposed canal over the Allegheny Front.

Instead, the focus of the joint commissioners' report was on the condition of Potomac and North Branch navigation from Cumberland to tidewater, and the effort to construct a continuous canal along this stretch that would connect with the National Road at Cumberland. On July 31, 1822, the survey party began its downstream journey from Cumberland in boats, at least one of which was said to draw "only seven inches of water." Despite their shallow drafts, the boats frequently stuck on shoals and ledges in the low water resulting from a continuing drought, and the survey crew frequently had to unload and drag the

boats off. Adding to the difficulties of the voyage, “nearly the whole party, commissioners as well as others” became sick. Thomas Moore was spared, but only temporarily.²⁵

The sickness was later described as “violent bilious fever.” Bilious fever was a term then used to describe several diseases, including malaria and typhoid. The survey party persevered until it was forced to quit on September 18th, having reached a point on the river just below Goose Creek, “157 miles below Cumberland.” From there, all the commissioners went to convalesce at William T. T. Mason’s home nearby, and resolved to resume the survey on November 4, 1822.²⁶

However, Thomas Moore, who had maintained his health during the survey, took sick shortly afterwards and died. In a newspaper account of the death, Isaac Briggs explained that Moore had attended a monthly Friends meeting in Indian Springs on September 20, 1822, got chills the next day, and had a continuous fever for 12 days until he died on October 3, 1822. The Virginia Board of Public Works resolved on October 26, 1822, that Isaac Briggs would replace Moore on the Potomac River survey. Briggs would write the survey report using Moore’s notes, and complete the survey as “the civil engineer of the state of Virginia.” Because the joint commissioners’ report made no reference to the survey’s last leg, it seems that Briggs apparently wrote it before completing the rest of the survey.²⁷

From December 11 through 18, 1822, Briggs, Naylor, Hunter and Fenwick, assisted by Moore’s son, Asa, surveyed from Goose Creek to Little Falls. Briggs completed his separate report for this last leg of the survey on January 23, 1823, which, unlike the joint commissioners’ report derived from Moore’s notes, focused on the costs of the proposed continuous canal rather than the condition of Potomac River navigation and the Potomac Company works. Briggs estimated that the total cost for a new continuous canal from Cumberland to the head of the Potomac Company’s Little Falls canal would be \$1,575,074.²⁸

Regarding the state of navigation, the joint commissioners’ report gave a worse assessment than Thomas Moore’s report had two years before. The new report concluded that navigation on the upper Potomac was practical for only “thirty three to forty five days” per year for “fully loaded boats.” The number of navigable days would increase as one approached Great Falls, and decrease towards the head of the river.

The report stated that the navigable periods were chiefly during spring and fall floods and freshets, when the river was high but also fast and dangerous. Farmers and merchants who overestimated the duration of freshets could find their products stranded. The joint commissioners stated that “at the time of their examination of it [the river], there was not sufficient depth of water for the navigation of a boat drawing even six inches.” That is, a boat with a draft only half that specified in the acts chartering the Potomac Company. And as for recommending the river’s susceptibility to improvement, the report basically condemned the in-river “sluice navigation” approach used by the Potomac Company.²⁹

The report contained a December 20, 1822, letter from John Mason that responded to the joint commissioners’ earlier inquiries and showed that the company was deeply in debt. The total expenditures for the company (including construction and maintenance of its works, and presumably salaries) had been \$729,387.29. Through August 1, 1822, the total collected for tolls was \$221,977.67³/₄. Considering that the company paid a single dividend of \$3,890 to stockholders in 1802, the company was roughly a half a million dollars in debt—as had been recognized earlier in the District of Columbia Committee of the House of Representatives’ report.

In letters to the governors of Maryland and Virginia, the joint commissioners said that they “upon full consultation do not deem it prudent, or expedient, to further aid the Potomac Company; the only alternative therefore that remains is to divest them of character and adopt some more effective mode of improving the navigation of the river . . .” In other words, the joint commissioners recommended building a new continuous canal, but without the Potomac Company’s participation.

In addition to the death of Thomas Moore, misfortune soon struck others involved in the 1822 Potomac survey. Elie Williams never recovered from his “bilious disorder” and died in December 1822. Isaac Briggs was greatly disappointed when Claudius Crozet, not he, permanently replaced Moore as Virginia’s principal engineer. In 1823, while leading the first survey for a Baltimore to Potomac Canal, Briggs and all other survey party members took sick, including Athanasius Fenwick, who again served as

a commissioner. Fenwick died in September 1824. Briggs finished the report for the 1823 survey, but was invalid the rest of his life and died of malarial fever in 1825.³⁰

Just as George Washington championed in-river navigation and the Potomac Company, Charles Fenton Mercer championed the independent canal that succeeded it. Mercer, a U.S. Congressman from Loudoun County, Va., organized several local meetings to drum up support for the proposed new canal. These led to a three-day canal convention in Washington D.C. in November 1823. The meetings successfully gained public and political support for the new canal that was eventually named the Chesapeake and Ohio (C&O) Canal. Mercer developed much of the federal legislation needed to make the C&O Canal a reality, and would later serve as its first president.³¹

Army engineer John James Abert and other topographical engineers, acting under the Board of Engineers for Internal Improvements, subsequently performed another canal survey and agreed with Thomas Moore on the practicality of connecting the Potomac with the Youghiogheny or Monongahela Rivers by canal. Their report, issued in 1826, estimated the total cost of a new canal connecting to the West (a canal bigger and longer than the one planned by the joint commissioners) would be \$22,237,427.69. This great cost dampened enthusiasms for the new canal. However, following another canal convention in December 1826, President John Quincy Adams appointed Erie Canal engineers James Geddes and Nathan Roberts to conduct yet another survey. Geddes' and Roberts' 1827 survey and report estimated the cost of a canal just to Cumberland to be \$4,500,000—a much more acceptable cost.³²



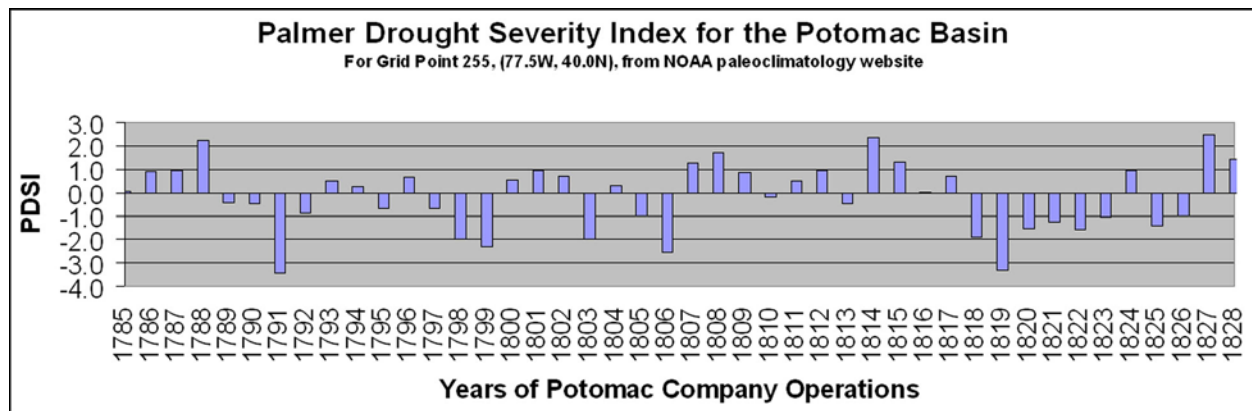
Harpers Ferry, detail from J. J. Abert's 1825 map (courtesy of National Archives).
The island channel along the Maryland shore was the upper part of the long canal.

The Virginia and Maryland legislatures passed acts chartering the new C&O Canal, and public subscriptions were first raised for it in late 1827 and early 1828. In August 1828, still heavily in debt and having lost political favor, the Potomac Company surrendered its properties, rights and operations to the C&O Canal Company. The C&O Canal Company would build feeder dams across the Potomac that would prevent further through-traffic on the river. Only local river commerce connecting to the new continuous canal by river locks would be possible.

When its conclusions and recommendations are contrasted with those of Thomas Moore's report of his 1820 Potomac survey and the District of Columbia Committee's report, we see that the joint commissioners' report was key to the Potomac Company's end. One wonders: Had Moore lived to write the latter report, would it have been so negative toward the Potomac Company?

It is important to note that the 1822 survey was made toward the end of a prolonged and severe drought, lasting from 1818 through 1823. No previous drought during the Potomac Company's operation had been that long. (See accompanying graph of severity of droughts.) One might also surmise that the continuing deforestation and development of land in the Potomac River watershed during the Potomac Company's operations increased rainfall runoff, further lowering ground water supplies and water levels during dry seasons. Thus the low water conditions experienced by the joint commission must have been far worse than previously experienced.³³

A great value of the reports for the 1820 and 1822 Potomac surveys is that they present contemporary descriptions of navigational works and conditions on the upper Potomac River and its North Branch. Appendix I contains the complete report of Thomas Moore's 1820 survey and Appendix II presents excerpts of the joint commissioners' report that described their 1822 boat trip from Cumberland to Goose Creek.



Severity of droughts during Potomac Company operations. Note the prolonged 1818–1823 drought. (D. Guzy)

¹ Thomas Jefferson, *Notes on the State of Virginia*, Electronic Text Center, University of Virginia Library, originally published 1781–1782. Query 2, page 131. Note that “batteaux” rather than “bateaux” was the preferred spelling during colonial times and through the time of Potomac Company operations. The former spelling is still used by historians, and will be used in this book.

² Meredith Mason Brown, *Frontiersman – Daniel Boone and the Making of America*, Baton Rouge, 2008, page 233

³ J. Thomas Scharf, *History of Maryland: From the Earliest Time to the Present Day*, Baltimore, 1879, page 519. *Votes and Proceedings of the House of Delegates of the State of Maryland, November Session, 1783*, pages 13–15.

⁴ Diary entries for September and October 1784, and October 10, 1784, letter to Benjamin Harrison (George Washington papers). Joel Achenbach's *The Grand Idea—George Washington's Potomac and the Race to the West* (New York, 2004) presents a recent study of Washington's 1784 trip and his vision for opening routes to the West.

⁵ The Maryland act was *An Act for Establishing a Company for Opening and Extending the Navigation of the River Patowmack*, November 1, 1784, Chapter 33 of 1784 Maryland Assembly acts. The Virginia act chartering the Potomac Company was similar to the Maryland act (Bacon-Foster Appendix G, pages 210–233).

⁶ Articles 17 and 18 of the acts charting the Potomac Company. Delays in completing the Potomac Company's works required new legislation to accommodate them, e.g., Maryland acts of 1786 Session, Ch. 2, 1790 Sessions Ch. 35, and 1794 Session, Ch. 29.

⁷ A modern way to quantify and compare the severity of river rapids is through the standard difficulty classification developed for paddle sports (i.e., canoeing, kayaking, and whitewater rafting). The following is an abbreviated set of definitions:

Class I (easy): Fast moving water with riffles and small waves.

Class II (novice): Straightforward rapids with wide, clear channels which are evident without scouting.

Class III (intermediate): Rapids with moderate, irregular waves which may be difficult to avoid and which can swamp an open canoe.

Class IV (advanced): Intense and powerful but predictable rapids requiring precise boat handling in turbulent water.

Class V (expert): Extremely long, obstructed, or very violent rapids which expose a paddler to added risk.

Class VI (extreme and exploratory): These rapids have rarely been attempted and exemplify the extremes of difficulty, unpredictability, and danger.

⁸ January 16, 1790, letter from Potomac Company president Thomas Johnson to Virginia Governor Randolph (William P. Palmer, editor, *Calendar of Virginia State Papers and Other Manuscripts*, Vol. 5, New York, Kraus Reprint Corp., 1968, pages 99–100). The phrase “boats returning” implies the use of batteaux rather than flatboats (see later discussion on boats).

⁹ George Washington’s diary entry for July 3, 1786 (see discussion of the diary and letter collections that comprise the George Washington papers in this book’s References section). The diary entry said that the road would end on the Monongahela “below the Tygart Valley,” which might place it near present day Fairmont, W.Va. However, George Fenwick would later draw a map based on Deakins’ survey that showed the road ending at Morgantown (Ref. Robert J. Kapsch, “The Potomac Canal: A Construction History,” *Canal History and Technology Proceedings*, Canal History and Technology Press, Volume XXI, March 2002, page 203).

¹⁰ Gilpin and Smith must have issued an official report of their survey, because Thomas Moore and others referred to it later. Unfortunately, this author could not find such a report in the Potomac Company records. However, some of the survey’s information is contained in a September 2, 1789, letter Gilpin wrote to Washington (George Washington papers). There was also a newspaper report of the survey obviously written by Gilpin (but unsigned) that appeared in the *Alexandria Daily Advertiser* on September 2, 1789, and was reprinted in the *Virginia Gazette* on October 1, 1789.

¹¹ September 2, 1789, letter from George Gilpin to Washington (George Washington papers).

¹² January 16, 1790, letter from Potomac Company president Thomas Johnson to Virginia Governor Randolph (William P. Palmer, editor, *Calendar of Virginia State Papers and Other Manuscripts*, Vol. 5, New York, Kraus Reprint Corp., 1968, pages 99–100).

¹³ Printed announcement: *Call from the President and Directors of the Patowmack Company*, dated Great Falls, July 2, 1799 (George Washington papers and Bacon-Foster, Appendix B, pages 169–171).

¹⁴ Potomac Company records

¹⁵ Dan Guzy, “The Potomac Company’s Canal and Locks at Little Falls,” *Maryland Historical Magazine*, Vol. 96, 4, Winter 2001, pages 425–427

¹⁶ Potomac Company records

¹⁷ July 13, 1818, letter from Thomas Moore (1760–1822) to Isaac Briggs (1763–1825) in the files at the Sandy Spring Museum, Sandy Spring, Md. The Rome to Utica section of the Erie Canal was so level that it required no locks; thus Briggs’ experience in canal building was also limited. In the joint commissioners’ report of their 1822 survey (discussed later), Briggs noted that he and Moore had completed a part of the James River Canal.

¹⁸ Minutes of August 2, 1819, annual meeting in Potomac Company records and Virginia Board of Public Works (Va. BPW) 4th annual report, 1819, page 40. Bacon-Foster, page 125.

¹⁹ In a June 7, 1820, letter to Potomac Company president John Mason, Moore asked for the skiff, but also suggested that if the river were too low from Westernport to Cumberland, he would examine that stretch without a boat. Mason ordered James Moore, the Potomac Company treasurer, to meet Thomas Moore at Westernport and to provide him “proper transportation.” This response and the survey report itself seem to imply that Moore’s first Potomac survey was done all by boat. However, the report does not actually note “our little skiff” until it was below Seneca Falls, so part of survey might have been done by land (Potomac Company records).

²⁰ See Appendix I.

²¹ “Report of the Committee of the District of Columbia,” *House of Representatives Report No. 111, 17th Congress, 1st Session*, May 3, 1822

²² Report of annual meeting of president and directors of Potomac Company, August 6, 1821 (Bacon-Foster, pages 131–132). Va. BPW 5th annual report, 1820, page 135.

²³ Dan Guzy, “The Potomac River Survey of 1822,” *Maryland Historical Magazine*, Winter 2008, pages 382–403, provides more information on the joint commissioners and their survey.

²⁴ See Appendix II for descriptions of the different versions of the joint commissioners’ report, plus excerpts of the material most pertinent to Potomac River navigation.

²⁵ The start of the survey’s boat trip from Cumberland is discussed in the letter from Naylor, Hunter and Fenwick to the Governor of Virginia, in the preface to the Va. BPW version of the report.

²⁶ Va. BPW version of the joint commissioners’ 1822 survey report. A September 24, 1822, letter from E.G. Williams to William Elie Williams mentioned that the commissioners stayed at Mason’s house (*Otho Holland Williams Papers* at the Maryland Historical Society).

²⁷ *Richmond Enquirer*, October 29, 1822 (photocopy in files at the Sandy Spring Museum). Va. BPW annual report, 1822, page 13. George Washington Ward in his *The Early Development of the Chesapeake and Ohio Canal Project* (Baltimore, 1899) claimed that Briggs had assisted Moore in the 1822 survey. However, the evidence infers that Briggs was not involved in the survey until after Moore’s death. Briggs had to get Moore’s notes from Moore’s estate, implying he did not have his own notes. Briggs replacement of Moore on the survey went through a formal process with the Va. BPW that would seem unnecessary had Briggs been involved with the survey from its beginning.

²⁸ Isaac Briggs, *Report on the Potowmack*, in the 8th annual report of the Va. BPW, published Richmond, 1824, pages 11–65. Asa Moore had worked with Briggs on the Erie Canal. The early plans for the Potomac Canal, later renamed the Chesapeake and Ohio (C&O) Canal, assumed that it would connect to the Potomac Company’s Little Falls Canal. The joint commissioners’ report

initially estimated the total cost for a new continuous canal from Cumberland to the head of the Potomac Company's Little Falls canal to be \$1,578,954, but Isaac Briggs' second report gave a more detailed accounting of this estimate and slightly lowered it to \$1,575,074.

²⁹ See the "Present State of Navigation" in Appendix II.

³⁰ Files at the Sandy Spring Museum. Briggs-Stabler Papers, 1793–1910. Maryland Historical Society (online at <http://www.mdhs.org/library/Mss/ms000147.html>). Ella Kent Barnard, "Isaac Briggs, A.M., F.A.P.S (1763–1825)", *Maryland Historical Magazine*, December 1912, page 419. Elie Williams' obituary in the December 31, 1822, issue of the Hagerstown, Md. *Torch Light*, noted that he died on December 29, 1822, after "a long and severe bilious disorder contracted on the survey of the Potomac, ordered by the Legislatures of Maryland and Virginia." Information on Athanasius Fenwick was gathered from Linda Reno and various old newspaper accounts.

³¹ Walter S. Sanderlin, *The Great National Project—A History of the Chesapeake and Ohio Canal*, Baltimore, 1946. Karen Gray of the C&O Canal Association shared information on Mercer and the actions leading up to the chartering of the C&O Canal.

³² Sanderlin, *The Great National Project*, pages 55–56, and personal communications with Karen Gray.

³³ NOAA's Palmer Drought Severity Index provides drought information based on tree ring growth (www.ngdc.noaa.gov/paleo/pdsi.html). Grid Point 255 represents conditions in the Potomac River basin. The drought severities from 1818 through 1823 are similar to those of the recent droughts of 1999, 2001 and 2002. The prolonged effects of the 1818–1823 drought on ground water supplies to the Potomac must have further decreased water levels. The September 24, 1822, letter from E.G. Williams (see earlier endnote) cited the bad drought. A November 13, 1822, letter from James Stubblefield, Harpers Ferry Armory Superintendent, to Col. George Bomford noted a "scarcity of water" during the summer of 1822 that hindered armory water power supplies (David T. Gilbert's *Waterpower*, Harpers Ferry Historical Association, 1999).

Canals, Locks, Sluices, and Fish Weirs

Major Works

The Potomac Company's major navigational works comprised the canals with lift locks around Great and Little Falls, the sluices at Seneca and Shenandoah Falls, and the series of canals, locks and a single sluice along the lower Shenandoah River. And although its sluice at House Falls seems no more significant than others at Paynes and Stubblefield Falls or elsewhere, the company listed it among its major works. Most of the Potomac Company's minor works went unmentioned in company records, and their design, location and quantity are not well understood today.

Appendix III presents a compilation of information on the Potomac Company's major works, gathered from the company records and other accounts. These indicate that canals and sluices tended to be 16 to 20 feet wide. George Washington and the early Board of Directors chose to use canal locks sparingly, relying on sluices or "chutes" without locks whenever possible. Sluices were also often called "canals."

The canal locks were usually 12 feet wide, although the initial three Little Falls locks and one of the five Great Falls locks were wider. All lock lengths were nominally 100 feet, but some accounts indicated shorter lengths. Lock lifts varied greatly, with the greatest lifts of 18 to 20 feet for the lower two Great Falls locks. Builders of later canals understood that uniform lock sizes meant less water wastage and faster filling times. For example, most C&O Canal locks had a lift of eight feet.

Today, the canal and locks in the National Park Service's Great Falls Park in Virginia are the best preserved and best known of the Potomac Company works. Remnants of the Little Falls, Seneca Falls and Shenandoah River works can still be seen by those who make the effort to locate their unmarked sites. The C&O Canal's construction obliterated all traces of the Potomac Company's "long canal" along the Maryland shore at the Potomac River's Shenandoah Falls. And the House Falls sluice is still functional; fishing boats and pontoon pleasure rafts use it regularly.



Lock seats for the Potomac Company's Lock No. 1 at Great Falls. (D. Guzy)

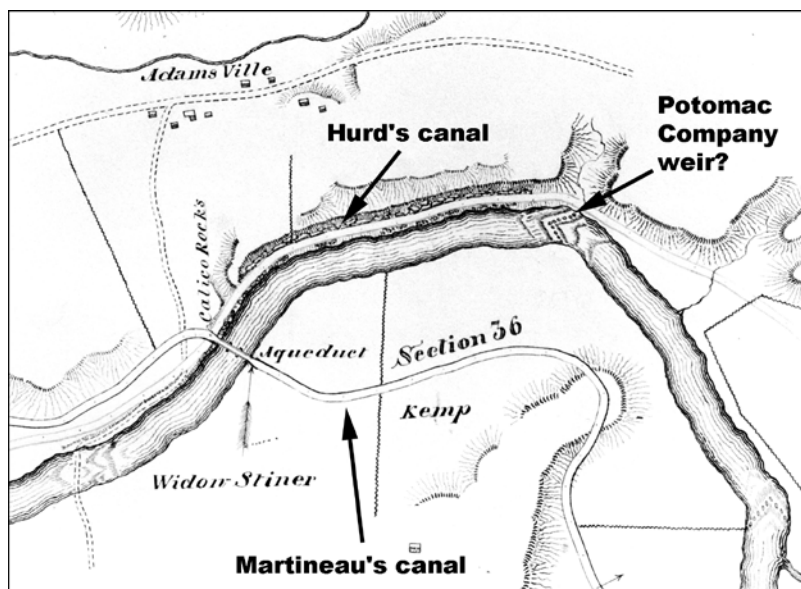
Minor Works and Fish Weirs

The Potomac Company's minor navigational works were stone weirs, sluices and walls built in the river or along its shores to enable navigation through shallow stretches where ledges or shoals could not be avoided. The company also blasted out rocks and excavated channels in the bed of the river. The company's records usually made only vague references to "river clearing" or "improvement" efforts, which could include both the removal of obstacles, such as ledges and fish weirs, as well as the erection of navigational weirs and walls built on an ad hoc basis. The reports from the 1820 and 1822 Potomac River surveys gave a little more information on the company's minor works, but not much more.

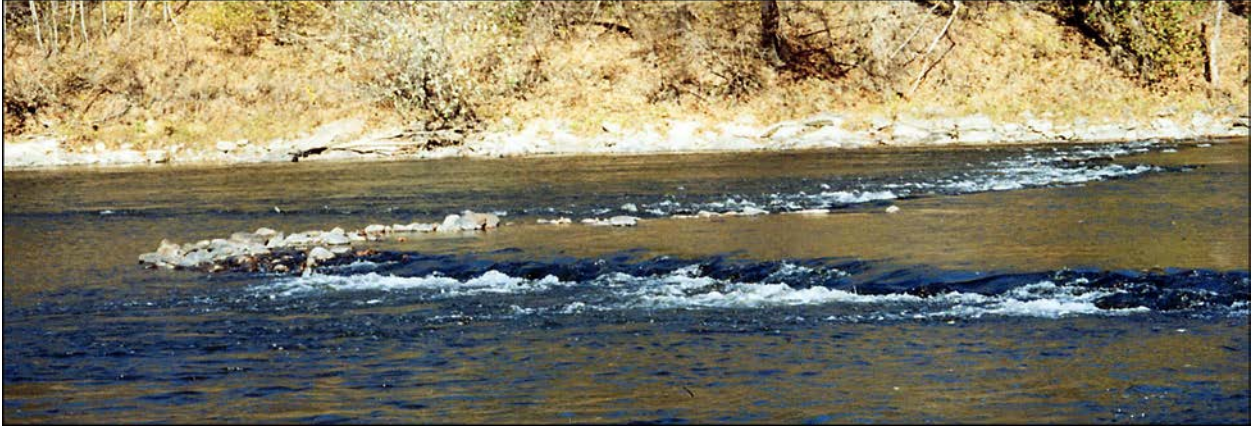
Constructed from stone gathered in and near the river, navigational weirs could be similar to V-shaped fish weirs. Fish weirs were built to collect fish into "traps" or "pots" placed at the apex of each downstream-pointing "V" formed by two straight stone weir wings. Fish weirs were constructed in shallow stretches of the Potomac and its tributaries from prehistoric times until at least the early part of the twentieth century. Maryland enacted laws as early as 1768 to prohibit "fish dams" on the Potomac and Monocacy Rivers, in order to allow navigation on those streams. However, fish weirs were continuously built and rebuilt despite their illegality and attempts by the Potomac Company, and later Maryland's Commission on Fisheries, to remove them.¹

On other rivers, fish weirs in shallow waters were converted into navigational works by simply widening their openings to allow boat traffic through. This likely happened on the Potomac. And it is just as likely that some navigational weirs were converted to fish weirs after the Potomac Company ceased operations.²

A V-shaped navigational weir is simply two opposing wing dams with an opening for a boat passage. Potomac Company records documented the use of oblique wing dams to feed canals and sluices. An advantage of oblique wing dams and V-shaped weirs over transverse dams built perpendicular to the river is that because their outer ends are located upstream, they need not have to cross the whole stream to raise water levels. Although contemporary accounts did not specifically describe V-shaped navigational weirs in the Potomac River, we can assume that the Potomac Company built them. Their use was more clearly documented on other rivers. Maps of the Monocacy River made from John Martineau's 1829 canal survey show V-shaped weirs that might have been left from the Potomac Company's river clearing effort.³



Detail from John Martineau's 1829 map of proposed Monocacy River canals. This shows a then-existing V-shaped weir, which might possibly have been a navigation weir. Flow is towards the left. (courtesy of Frederick City government)



Potomac River fish weir remains above Snyder's Landing and the Horsebacks—flow is towards the left.
(D. Guzy)

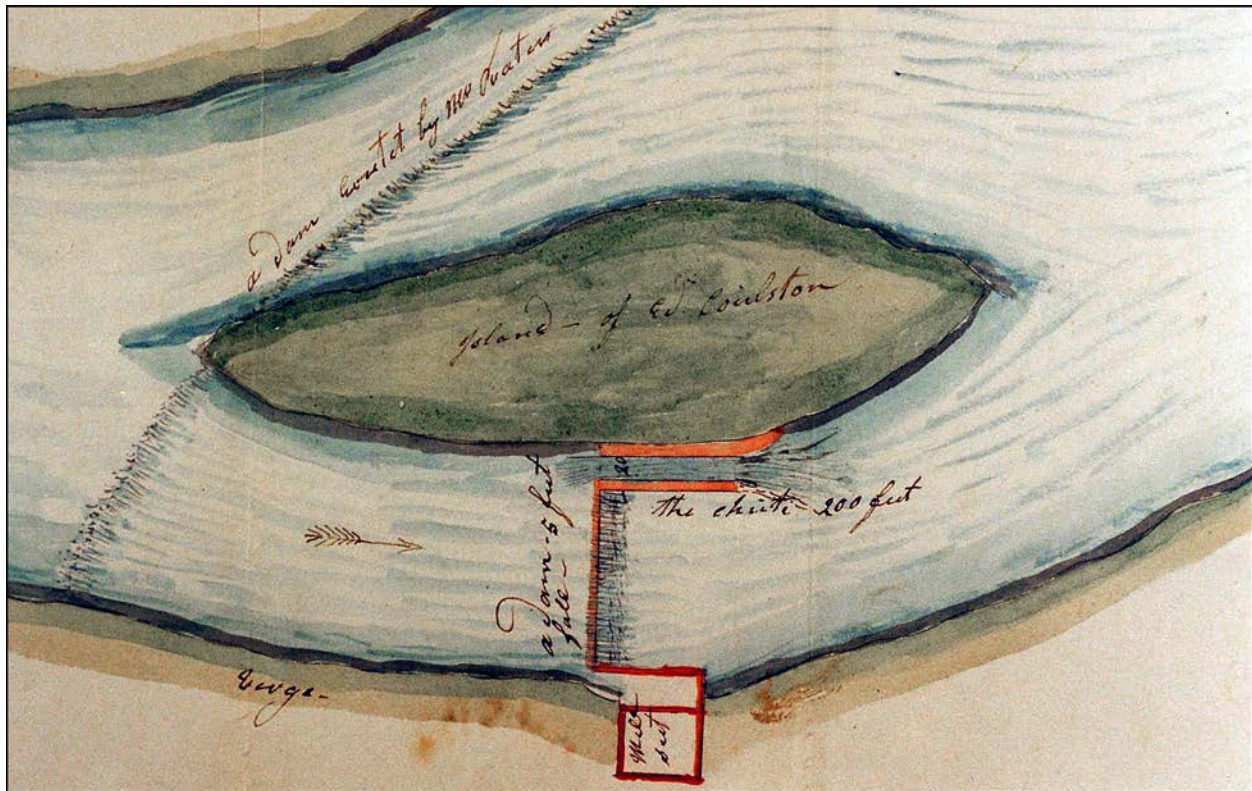


Potomac River fish weir remains between Shepherd's Island and Maryland shore—flow is towards the right.
(D. Guzy)



Monocacy River fish weir remains near Buckeystown—flow is towards the left.
(D. Guzy)

Where the river or its channels were narrow, such as on the North Branch upstream of Cumberland, or between islands and the shore on wider stretches, straight dams were built completely across and perpendicular to the river to raise water levels and feed chutes for navigation. Such configurations were also used to create low-head milldams and still allow navigation. (See accompanying sketch.)⁴



Edward Colston's proposed milldam and chute, 1818—flow is towards the right.
(Courtesy of National Archives).

The joint commissioners described such transverse dam and chute structures in the report of their 1822 Potomac survey:

The ruins of this kind of work, are for some distance above Cumberland, but do not, however, reach the Savage river, and extend at greater or less intervals to where the general depth of the water is considerably increased, becoming more and more rare as the water is more abundant. They consist in low dams running across from shore to shore, elevated about 18 inches or two feet from the bottom, and made of rounded stones picked up out of the bed of the river, of a size that a man can conveniently handle, the greater part not larger than a man's head, and raised on a broad basis of from ten to twenty feet in width. This transverse low wall or dam is usually connected with two walls about the same height, but built on a narrower basis of from six to eight feet placed parallel to each others, and to the shores at the distance of 20 feet from each other; through which passage by a gap in the transverse dam, it is intended to force the current of the river, and to deepen the water by collecting it into this artificial channel.⁵

The joint commissioners' report went on to complain about the poor state of repair of these structures, and sluice navigation in general.

In the report of his 1820 Potomac survey, Thomas Moore was far less critical of sluice navigation than the joint commissioners. One of his proposals suggested simply correcting flaws in how the Potomac Company and its contractors applied sluice navigation. For example, some sluices had been built along the inner bends of the river where flow is slower, and thus these sluices filled with sediment. Moore stressed the importance of constructing sluices so that they would be parallel to the flow of the river. This would both help flush out sediment and prevent cross currents that would make boat passage through sluices difficult. He also emphasized that the height of the dams be no more than needed for low-water conditions, else they become obstruction when the river levels rose.⁶

Both Thomas Moore's and the joint commissioners' reports were highly critical of the Potomac Company's attempts to improve navigation by excavating channels in the bed of the river. They concluded that digging deep new channels increased the flow and drainage of the river locally, creating new shallow areas upstream. Thus the net effect of excavating channels was simply to relocate navigational obstructions.

In 1822, the joint commissioners found it difficult to distinguish the ruins of some navigational structures from fish weirs. It is much more difficult to do so today. Ravages of time and floods have destroyed most of the minor navigational structures beyond recognition.

Some accounts described markers and guide posts that directed boatman toward channels and weirs along the river. Being more fragile than the navigational structures, one can assume that their lives were even shorter.⁷

Later chapters will discuss in more detail what contemporary accounts told us about navigation and structures in specific river stretches.

¹ Dan Guzy, "Fish Weirs in the Upper Potomac River," *Maryland Archeology*, Volume 35, No. 1 (1999), pages 1–24, and Dan Guzy, "Fish Weirs in the Monocacy and Potomac Rivers," *Maryland Archeology*, Volume 37, No. 2 (2001), pages 11–21. Today, the Potomac and its tributaries contain the ruins of many stone weir structures that are occasionally called "Indian fish traps," but which are likely of more recent vintage. Some of these may contain the remains of old navigational weirs. These ruins can be seen during periods of low water as V-shaped riffles pointing downstream. For example, one large fish weir is clearly visible during dry spells just upstream from the Interstate 81 bridge at Williamsport. The outlines of the darker lines of stone against lighter river bottom sediment are also visible from aerial views during periods when the water is high but clear.

² Philip Lord, Jr., in "The Wing Dams at Snouk's Rapid; A Proto-Lock on the Mohawk River" (*The Bulletin, Journal of the New York State Archaeological Association*, No. 106, 1993), discussed how navigational weirs evolved from aboriginal fish weirs and noted that both types of weirs coexisted on the Mohawk River in the early 1800s.

³ A later chapter will discuss John Martineau's survey. Dan Guzy, "Down the Monocacy—River Navigation and Canal Surveys in Frederick County, Maryland" (*Catoctin History*, Issue #5, Spring/Summer 2005) provides further information on John Martineau's Monocacy River survey and maps.

⁴ The sketch of the Potomac River mill, dam and chute was included in an April 9, 1818, letter from Edward Colston to the Potomac Company. Colston proposed to build these opposite James Prather's (or Praither's) mill and dam on the Potomac, just upstream of the current Four Locks area in Maryland and below Little Georgetown, W.Va. His chute was to be twenty feet wide (Potomac Company records). The 1822 Potomac survey noted only Prather's sawmill and dam, so Edward Colston likely never built the proposed works. He later built the Honeywood Mill at the C&O Canal's Dam No. 5. The slack water behind Dam No. 5 now covers the rapids and island at Colston's originally proposed site.

⁵ See Appendix II.

⁶ See Appendix I.

⁷ Thomas and Williams, *History of Allegany County, Maryland*, Volume 1, page 202. September 7th 1798, "Memorandum of the examination of the work done by Capt. Thos. Beall on the Bed of the River Potomac" by John Templemen and Col. Eduard McCarty (Potomac Company records).

Boats, Cargo, and Tolls

Although the business and engineering of in-river navigational systems focused on the works to overcome rapids and obstacles, we should not lose sight of the fact that a voyage to market consisted mostly of open-water travel. The boats and their cargo were the key components of in-river navigation, as they had been since prehistoric times.

Boats

Lacking good archeological and historical evidence, we do not know for sure what boats were commonly used by the Indians on the upper Potomac River. Archeologists have found dugout canoes made from pine trees on the tidal Potomac. Without iron tools, the Indians could have used their burn and scrape process to make dugouts from the straight and soft wood of the tulip poplar tree, which was readily available along the upper Potomac. But could this crude process produce the smooth thin sides and bottoms needed to make the crafts nimble and portable enough for freshwater river use?¹



Dugout canoe at Virginia's Great Falls Park visitors' center. (D. Guzy)

Europeans with iron tools and carpentry skills carved dugout canoes for the upper Potomac, which they used at least as early as the 1736 Potomac River survey. A display at the Great Falls Park in Virginia features a 27-foot dugout found buried on the Potomac's South Branch. (Burying dugouts in river mud prevented both theft and cracking from drying.) As seen in the accompanying photograph, the sides of this canoe are well shaped, smooth, and thin. The display claims the tulip poplar dugout is "circa 1775–1802" and speculates that it was carved by a slave, perhaps following a long-remembered Ugandan design.

Anecdotal evidence shows that Indians used bark canoes on the upper Potomac River. In 1608, Captain John Smith found the Massawomecks, who traveled on this river, in bark canoes. Philemon Lloyd's 1721 map noted an Indian water route between the Susquehanna and Potomac Rivers, connected by an eight-mile portage between Conodoguinet and Conococheague Creeks. Lightweight bark canoes would lend themselves to such a long portage, whereas heavy, burned-out wood canoes would not.²

Baron von (or “de”) Graffenried claimed to have witnessed the construction and use of a bark canoe while visiting “those enchanted islands in the Potomac River above the falls” in 1712. (This might have been an elm bark canoe. Birch trees did not grow in this region.) Graffenried described a most entertaining return trip down the river from the Conoy (Piscataway) village of Canavest on Heaters Island, featuring a wild ride in a bark canoe through what must have been the Seneca Falls:

For the purpose of the descent, the Indians with marvelous skill made us in less than a half day a small boat of the bark of trees. We got into it, five of us, besides two savages, who managed the boat. We even put in our baggage. It was charming going down the river to see the beautiful country on the sides and the pretty islands, but when we came close to a great rock in the middle of the river, not far from the falls . . . we found the passage dangerous, for about this rock . . . there are still a number of small rocks and great stones, which make the passages swift, narrow, and bad. I did not want to go down it, and we all got out except Mr. Rosier, who, knowing the skill of the Indians, risked it. When we saw from a distance the turns they had to make, what inexpressible skill it needed to steer this canoe or boat, we almost thought there was some magic in the act, and we were very glad to be out of it, especially when we heard the Indians singing as they passed at great speed, almost striking against a great stone or rock. But this made my good Mr. Rosier pray, bold as he might be. At a quarter of a league beyond this bad passage they stopped and we got into the boat again. Good Rosier, still very pale with fear, assured us that he would never be so rash again. We went down the river very nicely and easily from there to the falls.

As the baron and the shaken Mr. Rosier mounted their horses above Great Falls and rode to the latter’s home, they saw:

how the Indians carried the boat upon their shoulders into the forest to repair it, they taking good care not to tell us that the end was damaged by striking against a rock. It was necessary to shorten the boat by cutting off the end. After having it well repaired, the Indians brought it back to the river and were rash enough to go down the rapids or great falls of the Potomac. They passed down very nicely, according to their story, but yet they caused us considerable anxiety because they delayed very much before they joined us at Mr. Rosier’s where we lodged.³

Despite “their story,” it is highly doubtful that the two singing Indians paddled over Great Falls in their bark canoe. The canoe might survive the Class II–III rapids of the Seneca Falls with only minor damage, but the Class V+ Great Falls rapids would surely crush it and its passengers. Had the Indians indeed shot the larger rapids, we would need to correct the current claim that 1986 saw the first descent of Great Falls in an open canoe.⁴

Be they dugout or bark, canoes were the chief vessels for early exploration and for the fur and peltry trade. However, boats capable of carrying several tons were needed to transport iron, flour, and other heavier products that rose in commercial importance during colonial times. During the French and Indian War, batteaux as well as canoes were mentioned as means of transporting military supplies on the upper Potomac. The term “batteaux” or “battoes” continued to be used before and during the Potomac Company’s operations; however the company itself commonly used the rather nondescript term “boats” to describe all cargo-carrying vessels.

On the Chesapeake Bay, the dugout canoe evolved into the sophisticated sailing workboat still called the “log canoe.” History also shows that the lumber-constructed, James River tobacco batteau owed its origin to the dugout. The James River batteau was typically 40 to 60 feet long, 6 to 8 feet wide, with a draft of 12 to 18 inches when fully loaded. These were generally smaller than Potomac River flour boats.

On several rivers, batteau-like boats were built sturdily to endure many repeated trips. Pointed ends and walkways allowed these boats to be poled upriver during return trips from downstream markets. The Durham boats on the Mohawk and Delaware Rivers are the batteau’s relatives, as are the keelboats of the Mississippi and Ohio Rivers.



Replica of a James River tobacco batteau. Note the sweeps at both ends used to steer the boat. (D. Guzy)

Given the ledges, shoals, and shallow stretches of the upper Potomac River, good design would dictate flat bottoms on all upper Potomac boats, like those used on the James River. There are a few contemporary references to Potomac “keel boats,” but these probably did not have external keels like those that aided sailing on the Mississippi and Ohio Rivers keelboats. Sailing on the narrower upper Potomac would be impractical in most stretches, so perhaps the keels were just strengthening members that did not extend through the boats’ flat bottoms.

Flatboats were another common type of boat on many rivers. These were square-ended, barge-like cargo vessels used for one-time downriver trips. Upon reaching their destination, flatboats were dismantled and their sawn lumber sold as merchandise.

Flatboats on the James, Shenandoah Rivers, and upper Potomac Rivers were sometimes called gondolas or “gundalows.” A number of old buildings in Harpers Ferry have lumber identified as being from Shenandoah River gondolas. “Ark” is another term for flatboat, and at least one account noted vessels of this name being disassembled and sold for lumber after being unloaded at Georgetown.⁵



Gondola sideboards carved into curved joists. The stingers nailed below the joists were cut from gondola ribs. (D. Guzy)

The Potomac Company records occasionally mentioned “rafts” as being distinct from “boats.” “Rafts” were likely just harvested logs or timbers tied together, which then were poled and guided lengthwise down the river. As such, the cargo itself became the vessel.⁶

There is much archeological, historical, and pictorial information about commercial boats on the James and some other eastern rivers, but unfortunately such information is lacking for upper Potomac commercial vessels. Other than the dugout canoe mentioned before, there are no preserved boats or discovered boat ruins that date from the time of the Potomac Company.

The Potomac Company’s records and correspondence fail to answer fundamental questions such as whether batteaux or flatboats were more commonly used on the upper Potomac. The company did not own cargo boats. However, it did want to stimulate better boat building. At their February 4, 1804, meeting, the Potomac Company’s president and directors approved two “premiums,” or awards, for this end. They approved \$100 to be paid for the best boat of:

improved construction, best calculated for interior navigation, the conveyance of produce, etc. . . . [T]he following considerations will govern, viz.—The safety of the Cargo—the gunwale not to be less than six inches above the water when fully loaded—the burden of the vessel, which shall not be less than One Hundred Barrels of Flour—the least draught of water, the Beam on the fork not exceeding eight feet, and the strength and workmanship of the boat and its capacity of ascending the stream.

Another award of \$50 would be paid to the boat “exhibiting the cheapest effectual covering to secure the cargo from the weather, and also the best means and devices for keeping the Cargo clean, and free from damage by water.”⁷

Boats had to fit inside the Potomac Company’s locks. So we know their widths had to be less than the standard 12-foot lock width, and their lengths had to be less than the 80- to 100-foot lock chambers and also allow for lock gate swings. (See Appendix III for variations in descriptions of lock lengths.) The drafts of commercial boats should have been less than the one-foot draft specified in the acts chartering the Potomac Company, the less the better to accommodate low-river conditions.

Potomac Company accounts typically equated minimal navigational conditions with those allowing the passage of “boats with 100 barrels of flour.” A barrel of flour traditionally weighs 196 pounds, so 100 barrels of flour would weigh nearly 10 tons. Considering vessel and crew weight, a rectangular boat made of one-inch poplar boards would have to be a minimum of 60 feet long and 6 feet wide to carry 10 tons of cargo and maintain a draft of one foot.

Calculations using the data in the accompanying table, *Potomac Company Tolls – 1800 to 1824*, and making a few assumption about the about the average weights of cargo types, will yield a 25-year average of around 12 tons per boat. The largest annual average cargo burden was 18 tons per boat in the fiscal year ending in August 1820. These values are averages, so some boats likely carried burdens greater than 20 tons.

The following will present several anecdotal accounts that collectively give information on upper Potomac boat designs and cargo weights:

- In February 1789, George Washington stated that although more river clearing work between Fort Cumberland to the Great Falls was needed, “two or three boats have actually arrived at the last mentioned place; one with 50 and another with near 100 Barrels. of flour.”⁸
- After completion of Seneca and Shenandoah Falls bypass canals in 1790, Thomas Johnson, the next Potomac Company president, wrote that: “Inland navigation is now constantly performed by Batteaux of ten tons burthen and upwards.”⁹
- In 1793, Tobias Lear, another Potomac Company president, gave the heaviest cargo estimates. “Boats carrying from one hundred and fifty to two hundred barrels of flour already pass from Cumberland to Great Falls; and many thousand barrels of flour have actually been brought in boats to the later place in the present year.”¹⁰

- In 1796, three years later, but still six years before completion of the Great Falls locks, Lear scaled back his estimates of cargo sizes. “Boats from 60 [to] 70 ft head and 9 [ft] beam ply constantly between Cumberland and Williams port on the Connigochegue, each carrying from 100 to 120 bbls flour, they come down in 1½ days, deposit their Cargoes and return home in 5 days—from Williams port, Shepperds town and the junctur[e] of the Potomac and Shanandoah they bring their flour, etc. Boats of the same description to the G. Falls and to Watts Branch, at both which places good store Houses are erected, from whence it comes (at present mostly by land) to the shipping port. Between 25 and 30,000 barr’ls flour was brought in boats to the falls and branch last year. About 30 boats ply upon the River and such was the demand for them when I was last up (in feb’y) that one hundred could have found full employment. In the present unfinished state of the works and scarcity of boats, it costs but one half to bring flour to market in this way for the distance of 60 to 70 miles of what it does by Waggon. Increase the distance and you make the expense less in a very high ratio.”¹¹
- A 1793 Virginia legislature act gave expectations for boats on Virginia’s Potomac tributaries (i.e., the Shenandoah River and South Branch). This act required the boats to be “well ceiled with strong plank, and sufficiently high to prevent the water in the bottom from damaging any part of the cargo, and shall be furnished with a tarpaulin cover, stretched over hoops in the manner of wagon covers, sufficient for defending the weather, and also with a hand pump, and shall have a plank footway upon each side of the boat . . . and shall be numbered.” (Interestingly, Maryland passed no similar acts for the Potomac River and North Branch, over which it had jurisdiction.)¹²
- In January 1800, the Potomac Company president and directors decided to design future locks to a reduced standard size of 12 by 80 feet. A justification for this was based on their observation that “the Boats which Navigate the River are rarely more than 7 to 8 feet wide and 60 odd feet long, none are more than 10 feet wide and 70 feet long.”¹³
- In 1802, Potomac Company president James Keith noted that as a result of the river clearing efforts that year: “I am completely fully satisfied that when the work is completed as intended in the part of the river from the upper end of Seneca Falls to Tide Water, which space also comprises the Great and Little Falls, a boat may pass at any season of the year carrying from 60 to 100 barrels of flour.”¹⁴
- One observer at Harpers Ferry in 1808 described boats longer and narrower than those mentioned earlier. “Batteaux descend the river in spring and fall, to Georgetown and Washington; they carry from 70 to 120 bbls. of flour, and are from 70 to 75 feet long, and 4 or 5 feet wide; the expence [sic] of transport is one dollar per barrel. Accidents rarely happen, and one per cent would be ample insurance for the whole navigation.”¹⁵
- An account of an 1812 visit gave a similar description of boats on the Shenandoah and upper Potomac Rivers. “The boats employed for the navigation of these rivers are seventy-five feet in length, five feet wide, draw eighteen inches water, and carry twenty tons burthen. Two of them, with more than a hundred barrels of flour each, pass the locks of the great falls in the space of an hour, and it rarely happens that the boat or cargo is injured.”¹⁶
- In discussing an overture from a private company to take over its Shenandoah River works, the Potomac Company “recommended to the president and directors [of the New Shenandoah Company] to aim at rendering the navigation of the river navigable in such manner that boats with burthen of 100 bbs [barrels] flour may at any period of the year when not prevented by frost pass down it.”¹⁷
- In the report of his 1820 Potomac River survey, Thomas Moore used the term “keel boats carrying 100 barrels of flour” as an attainable goal for river improvements between the mouth of New Creek (Keyser, W.Va.) and Cumberland.¹⁸

Considering all the quotes above, we can surmise that upper Potomac commercial boats carried from 50 to 200 barrels of flour. The dimensions of the boats mentioned ranged from 60 to 75 feet in length, 4 to 10 feet in width, and the drafts were as great as 18 inches.

Cargo and Tolls

The 1784 acts chartering the Potomac Company established 23 separate categories of tolls based on cargos that included flour, tobacco, whiskey, iron, coal, various food types, building materials, and even barrel staves. Empty boats paid a toll as well, but boats returning upstream after paying tolls on commodities on their downstream trips were exempt. Interestingly, although the western fur trade was a major consideration in the initial planning for opening the Potomac, by 1784 fur was not considered significant enough to make the list.

Potomac Company Toll Rates Specified in 1784 Virginia and Maryland Acts

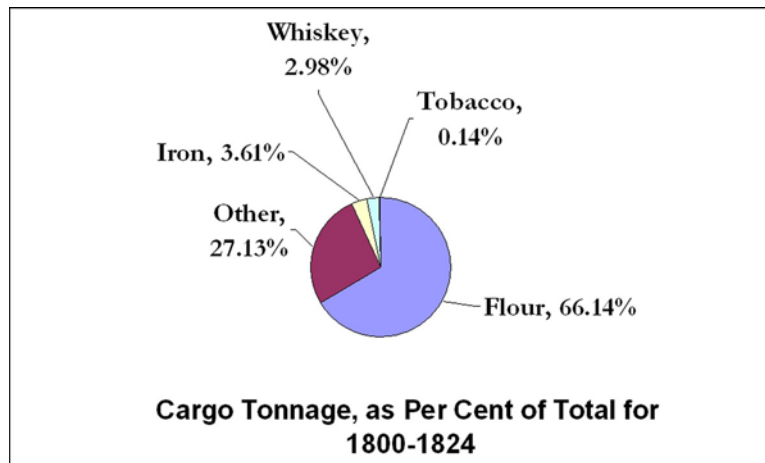
(Ref. Hanson's Laws of Maryland 1763–1784, Volume 203, page 387)

	At the mouth of the South Branch	At Payne's falls	At the great falls
	Sterling [pounds, shillings, pence]		
Every pipe or hogshead of wine containing more than sixty-five gallons,	£ 0 1 6	£ 0 1 6	£ 0 3 0
Every hogshead or rum or other spirits,	0 1 3	0 1 3	0 2 6
Every hogshead of tobacco,	0 1 0	0 1 0	0 2 0
Every cask between sixty-five and thirty-five gallons, one half of a pipe or hogshead; barrels, one fourth part; and smaller casks or kegs in proportion, according to the quality and quantity of their contents of wine or spirits.			
For casks of linseed oil, the same as spirits.			
Every bushel of wheat, peas, beans, or flaxseed,	0 0 0½	0 0 0½	0 0 1
Every bushel of Indian corn or other grain, or salt,	0 0 0¼	0 0 0¼	0 0 0½
Every barrel of pork,	0 0 6	0 0 6	0 1 0
Every barrel of beef,	0 0 4	0 0 4	0 0 8
Every barrel of flour,	0 0 3	0 0 3	0 0 6
Every tun of hemp, flax, pot-ash, bar or manufactured iron,	0 2 6	0 2 6	0 5 0
Every tun of pig-iron or castings,	0 0 10	0 0 10	0 1 8
Every tun of copper, lead, or other ore, other than iron ore,	0 2 0	0 2 0	0 4 0
Every tun of stone or iron ore,	0 0 5	0 0 5	0 0 10
Every hundred bushels of lime,	0 1 3	0 1 3	0 2 6
Every chaldron of coals,	0 0 5	0 0 5	0 0 10
Every hundred pipe staves,	0 0 2¼	0 0 2¼	0 0 4½
Every hundred hogshead staves, or pipe or hogshead heading,	0 0 1¼	0 0 1¼	0 0 3
Every hundred barrel staves, or barrel heading,	0 0 1	0 0 1	0 0 2
Every hundred cubic feet of plank or scantling,	0 0 10	0 0 10	0 1 8
Every hundred cubic feet of other timber,	0 0 5½	0 0 5½	0 0 11
Every gross hundred weight of all other commodities or packages,	0 0 1½	0 0 1½	0 0 3
And every empty boat or vessel which has not commodities on board to yield so much, except an empty boat or vessel returning, whose load has already paid at the respective places the sums fixed at each, in which case she is to pass toll free.	0 2 6	0 2 6	0 5 0

As seen in the toll rate table, the tolls for processed goods were higher (per volume or weight) than those for raw goods. Tolls for flour were about twice that for wheat. Tolls for “bar or manufactured iron” were three times that of “pig iron or castings.” And the toll for pig iron was twice that of iron ore.

Obviously, flour was the most important product shipped during the Potomac Company's operation. Wheat grew nicely in the Shenandoah and Cumberland Valleys, and maps show the streams feeding into the upper Potomac dotted with mills. The warring Great Britain paid a high price for exported American

flour, at least until these two countries began their own war in 1812. Flour accounted for two thirds of the tonnage reported in the Potomac Company's tolls (see accompanying chart and table). Whiskey, tobacco and iron were the only other items specifically named in the Potomac Company's toll records; the rest were grouped as "other articles."



By the time the Potomac Company ceased operations, coal shipments would become significant. The 1736 survey of the Potomac River found and mapped exposed coal seams along the North Branch near Georges Creek. George Gilpin's 1789 report noted that coal from that region was already being shipped to Hagerstown for a nail factory there. The U.S. Armory at Harpers Ferry was another early customer for "stone coal" (i.e., mineral coal, not charcoal) and Williamsport merchants advertised it for sale. However, before the mid-1820s, coal mining was only a part-time industry in which farmers dug out small surface or pit mines during their off seasons.¹⁹

During the winter, farmers would haul coal by wagons from the mines to Cumberland. At the river, coal would be loaded into boats in anticipation of the spring freshets needed to launch them downstream. "The price of coal in the east depended on the number of freshets the previous year." When a freshet came, men "from around the country" would quickly hire on for the downstream trip that "usually took three days." The return trip upriver would take "eight to ten days." Boats were "chiefly flat bottom, though some of them were 'keeled.' They were about seventy feet long and ten feet wide and were covered with tarpaulin stretched over hoops—the top resembling that of a Conastogo wagon, and were manned by a crew of four men, a steersman, a head oars man and two side oars men."²⁰

In 1828, as the Potomac Company was shutting down and the C&O Canal and the B&O Railroad started construction, the Maryland Mining Company became the first incorporated company to mine coal in Maryland. By 1850, Maryland would have incorporated thirty.²¹

Before the railroad reached Cumberland in 1842 and the canal in 1850, large boats shipped coal down the river to those sections of the C&O Canal already watered. There would be fifty or sixty shipments per year. "The boats as then built contained from one thousand to fifteen hundred bushels of coal, according to size; some were called flat-boats, and others keel-boats. The flat-boats were not brought back, but occasionally a keel-boat would return with salt, fish, or other commodities."²²

A cargo of fifteen hundred bushels of coal weighs about 60 tons—several times the burden carried by a flour boat during Potomac Company operations. Another source noted that coal shipments were "done in flatboats eighty feet long, thirteen feet wide, and three feet deep." The Potomac Company's locks were only twelve feet wide, so such boats must have passed through only the wider C&O Canal locks. Navigation during spring freshets avoided the shallow water hazards of the upper river, but the large river flows caused some coal boats to wreck.²³

Potomac Company Tolls – 1800 to 1824
(Ref: House of Representatives Report No. 228, 19th Congress, 1st Session, page 64.)

Years ending Aug.	Flour Barrels	Whiskey Barrels	Tobacco Hhds	Iron Tons	Other articles Estimated value	Return goods Estimated value	Total Estimated value	Number of Boats	Tonnage	Tolls collected
1800	16,584	84	25	0	\$2,950	\$7,851	\$129,414	296	1,643	\$2,138.58
1801	28,209	619.5	100	187.5	14,060	6,180	328,445	413	2,993	4,210.19
1802	17,250	379	5	238.5	27,233	0	163,916	305	1,952	3,479.69
1803	45,055	257	32	480.5	3,936	10,386	345,473	493	5,549	9,353.93
1804	39,350	578	8	88	3,250	7,514	284,041	426	3,823	7,765.58
1805	28,507	436	11	137	32,975	7,486	340,334	405	3,208	5,213.24
1806	19,079	459	5	20.5	3,553	4,998	86,790	203	1,226	2,123.69
1807	85,248	971	20	35	11,796	7,314	551,896	573	8,155	15,080.42
1808	48,463	1,535	3	13	10,532	7,613	337,008	508	5,994	9,924.27
1809	40,039	1,527	37	494	8,537	11,510	305,628	603	6,767	9,094.89
1810	40,757	1,080	13	191.5	5,703	0	318,238	568	5,374	7,915.85
1811	118,222	3,768	27	200	6,810	6,000	925,075	1,300	16,350	22,542.89
1812	55,829	3,143	6	360	1,694	7,320	515,526	613	9,214	11,471.37
1813	55,902	3,464	11	252	1,899	6,119	423,340	623	7,916	11,816.22
1814	38,769	2,684	18	361	676	5,314	311,094	596	5,987	9,109.82
1815	47,183	4,616	9	314	2,075	5,211	489,498	613	6,354	9,789.57
1816	35,918	1,774	29	419	9,292	6,371	357,661	550	6,152	7,501.52
1817	57,662	1,385	10	335	4,094	14,000	787,994	856	8,197	13,948.23
1818	58,226	3,126.50	2	428.75	8,750	15,124	681,925	746	9,778	10,332.26
1819	66,543	1,479	0	278.5	9,988	15,521	565,011	775	7,550	12,514.04
1820	75,272	1,215	14	227.5	16,588	12,230	420,818	917	16,506	13,107.32
1821	67,557	1,391	10	115	11,515	10,027	318,810	760	11,400	12,490.61
1822	50,138	2,416.50	31.5	300	17,245	6,508	369,523	782	11,730	11,103.51
1823	28,543	1,331	39	445.5	12,125	3,726	246,465	414	6,210	6,238.85
1824	47,599	2,738	55	564	13,512	3,562	331,641	662	9,546	9,857.14
Total	1,211,903	42,456½	520½	6,485 ¾	\$240,788	\$187,886	\$9,935,564	15,000	179,554	\$238,117.66 ¼

Note: The actual sums of annual amounts of whiskey, return goods, tonnage, and tolls collected vary slightly from the reported totals.

Although the Potomac Company had hoped and planned to collect tolls years before, it was not allowed to do so until the inclined plane and cargo lifting machine at Great Falls served as a temporary completion of its navigation system, while the Great Falls locks were still being constructed. The Maryland legislature passed such a law in 1798. However, the Potomac Company seems to have not recorded tolls until the fiscal year ending August 1, 1800.²⁴

Toll records show that the average number of annual shipments was 600 for fiscal years 1800 to 1824. Fiscal year 1811 was a record year in terms of shipments (1,300), barrels of flour (118,222), and tolls collected (\$22,542.89). This reflects the surge in the British demand for America flour, which peaked just before the War of 1812 ended such trade. Slightly more tonnage was reported for 1820 than in 1811 (16,506 vs. 16,350 tons), although the recorded number of shipments (917), barrels of flour (75,272), and tolls (\$13,107.32) were significantly less.²⁵

Tolls were collected at established locations along the Potomac, which varied somewhat over time. The 1784 acts chartering the Potomac Company stated that tolls would be collected below the mouth of the South Branch, near Paynes Falls, and at or above Great Falls. It also said that the South Branch toll would be reduced by two thirds if the river was made navigable only as far upstream as Fort Cumberland. The Great Falls tolls were twice those at the South Branch and Paynes Falls (see accompanying table on Potomac Company toll rates).

The several acts passed by the Maryland and Virginia legislatures to accommodate delays in opening navigation on the Potomac also established new toll locations. These locations included the mouth of Conococheague Creek (Williamsport, Md.), Hooks Falls (above Point of Rocks, Md.), Watts Branch (above Great Falls on the Maryland side) and Little Falls. When the locks at Great Falls were finally completed in 1802, the Potomac Company set Williamsport, Hooks Falls and Great Falls as its toll collection locations. The company reduced its toll rates after the wooden locks at Little Falls collapsed around 1815, and restored them when the new stone locks were completed there in March 1818. Between 1826 and 1827, company records cited tolls collected at Shepherdstown and Harpers Ferry, as well as Williamsport.²⁶

There were toll houses along the canals and locks at Great Falls and Little Falls, and we know that tolls were collected along the Potomac Company's Shenandoah River works. It is easy to understand how tolls were collected at these canals and locks, where boats had to stop as locks filled and drained. However, it is not obvious what procedure was used to halt boats and collect tolls at the other locations where there were no canals and locks, particularly where the channel was wide, such as at Williamsport.

As noted above, during spring freshets in the late 1820s, an increasing amount of coal was shipped downstream in flatboats larger than the Potomac Company works allowed for. Traditionally, timber rafts were also launched in the spring. Upstream of the Shenandoah Falls (and the armory dam and canal at Harpers Ferry), the weirs and sluices were built to aid low water navigation and were not needed during the high-water freshets. So even if toll collectors could stop these fast-moving, heavily-laden crafts, the boaters and rafters had some justification for not paying tolls.

Nevertheless, the Potomac Company's annual report for 1827 indicated some success in gathering such tolls. It noted that "[w]ithin the last few years the supply of . . . coal, lumber and timber from the upper of the Potomack to intermediate points on its banks above Great Falls has been gradually increasing . . ." And that "collectors have been appointed at Williamsport, Shepherdstown and Harpers Ferry" where "considerable tolls have already been collected."²⁷

¹ Private communication with Stephen R. Potter, Regional Archeologist, National Capital Region, National Park Service.

² The Iroquois, Shawnees and Susquehannocks each visited the upper Potomac region from the European contact period through the early 1700s. These tribes built elm bark canoes because their native lands, like the Potomac region, were too far south of where the large birch trees grow. William B. Marye discussed Philemon Lloyd's map and the portage route in his "Patowmeck Above Ye Inhabitants," *Maryland Historical Magazine*, Vol. 30, No.1, March 1935, page 3, and Vol. 32, No. 4, December 1937, pages 292–300. Paul A. W. Wallace, *Indian Paths of Pennsylvania* (Harrisburg, 1993, page 39) also discussed the eight-mile portage.

³ Vincent H. Todd, *Christoph Von Graffenried's Account of the Founding of New Bern*, Raleigh, 1920, pages 384–385.

⁴ The Conoy (Piscataway) Indians had long lived along the tidal Potomac where dugout canoes were used. It is noteworthy that they had learned bark canoe making in their new upper Potomac home.

The introduction of durable plastic kayaks and canoes in the 1970s soon led to the “first descents” of falls worldwide. Ed Grove, *Classic Virginia Rivers*, Arlington, Va., 1992, pages 118–123, describes the history of paddling through Great Falls.

⁵ W. E. Trout, *Shenandoah River Atlas*, Richmond, 1997, pages 80–83 discusses the reuse of gondola wood in Harpers Ferry buildings in general, and in the historic Masonic Hall in particular (where the accompanying photo was taken). See Bacon-Foster, Appendix E, page 193 for a discussion of “arks,” a term said to be used “by those who lived on the upper Potomac.” Flatboats on the Ohio River and its tributaries were also called arks (Ref. Solon J. and Elizabeth Hawthorn Buck, *The Planting of Civilization in Western Pennsylvania*, Pittsburgh, 1939, page 244).

⁶ William H. Shank, *The Amazing Pennsylvania Canals*, pages 4 and 75, notes the use of arks and sawn-lumber rafts on Pennsylvania rivers. Rafts made from sawn timbers were navigated down the Susquehanna and Allegheny Rivers, and both “arks” and “rafts” were used on the navigation system on Codorus Creek.

⁷ Advertisement in February 22, 1804, *Maryland Herald & Elizabethtown Advertiser*. Williamsport Chamber of Commerce, *Williamsport and Vicinity Reminiscences*, Williamsport, Md., 1933, page 24.

⁸ February 13, 1789, letter to Thomas Jefferson (George Washington papers).

⁹ January 16, 1790, letter from Thomas Johnson to Virginia Governor Randolph (William P. Palmer, editor, *Calendar of Virginia State Papers and Other Manuscripts*, Vol. 5, New York, Kraus Reprint Corp., 1968, pages 99–100).

¹⁰ Tobias Lear, *Observations on the River Potomack, etc.*, New York, 1793 (Edited and republished by Samuel T. Chambers, Baltimore, 1940).

¹¹ Letter from Tobias Lear to Thomas Jefferson, March 13, 1796 (Nute, page 722).

¹² *An Act for Regulating Inland Navigation on Potomac River, above the Tide Water*, passed December 9, 1793 (Samuel Shepherd, *The Statutes at Large of Virginia, from October Session 1792, to December Session 1806 [i.e. 1807] Inclusive, in Three Volumes (New Series,) Being a Continuation of Henning*, 1835, reprinted 1970, New York, AMS Press, Chapter 24, pages 239–240). The act is also cited in Bacon-Foster, page 226, and in W.E. Trout, *Shenandoah River Atlas*. This act was one of several navigation laws, for several Virginia rivers, issued in the Virginia legislative session beginning October 1793.

¹³ January 20, 1800, *Report of the President and Directors to the Stockholders* (Potomac Company records).

¹⁴ Letter from James Keith to the Governor of Virginia, November 24 1802 (William P. Palmer, editor, *Calendar of Virginia State Papers and Other Manuscripts*, Vol. 9, New York, Kraus Reprint Corp., 1968, pages 335–337).

¹⁵ John Edwards Caldwell, *A Tour through Part of Virginia, in the Summer of 1808*, New York, 1809, page 8.

¹⁶ David Bailie Warden, *A Chorographical and Statistical Description of the District of Columbia: the Seat of the General Government of the United States*, Paris, 1816, page 7 (republished by Lost Cause Press, Louisville, in 1978). Warden’s estimates of draft and burthen are not consistent with each other, and so either may be incorrect. Note that Warden referred to both Caldwell’s *A Tour through Part of Virginia, in the Summer of 1808* and Albert Gallatin’s report on internal improvements in his book, so his descriptions may not have been based on personal observation.

¹⁷ Minutes from August 7, 1815, meeting (Potomac Company records).

¹⁸ See Appendix I.

¹⁹ Donna M. Ware, *Green Glades & Sooty Gob Piles – The Maryland Coal Region’s Industrial and Architectural Past*, Maryland Historic Trust, 1991, pages 217–218.

Howard Eavenson (*The First Century and a Quarter of American Coal Industry*, 1942, pages 230–237) noted that the Harpers Ferry Arsenal purchased stone coal at least as early as 1802. Between 1818 and 1827, the arsenal purchased 8,447 tons of stone coal—for an average of 845 tons per year. Eavenson speculated that this coal was delivered by river, but noted there were no records of such transport.

Horatio N. Parker, et al (*The Potomac River Basin*, USGS, HR Document No. 786, 1907) wrote that “[t]hree or four bateaux arrived at Washington April 20, 1820, laden with coal from the rich mines at Cumberland.” Eavenson (page 237) referenced Potomac Company records of coal passing through the locks on the way to Washington, D.C. or Alexandria, beginning at least as early as 1826. For the years from 1826 and 1830, these records cited annual quantities of coal to be, respectively, 58, 243, 508, 81 and 11 tons. These average to 180 tons per year, much less than the 845 tons per year (see above) purchased upstream at the Harpers Ferry armory.

²⁰ James W. Thomas and T. J. C. Williams, *History of Allegany County, Maryland*, Volume 1, 1923 (reprinted in Baltimore, 1969), pages 201–207

²¹ Ware, page 218

²² J. Thomas Scharf, *History of Western Maryland – Being a History of Frederick, Montgomery, Carroll, Washington, Allegany, and Garrett Counties – Vol. II*, Baltimore, Regional Publishing Company, 1968 (reprint of original, published Philadelphia, 1882), page 1435

²³ Harry Steigmaier, Jr., David Dean, Gordon Kershaw, John Wiseman, *Allegany County – A History*, Allegany County Commissioners, Cumberland, Md., 1976, page 121

²⁴ “An Act to authorize the Patowmack company to receive tolls on produce carried through the canal at the Great Falls, and for other purposes therein mentioned,” *Maryland Session Laws of 1797*, Chapter 93, passed January 20, 1798.

²⁵ The numbers cited in this paragraph used data from the accompanying table of Potomac Company tolls from 1800 to 1824 and assumed that the “number of boats” equated to the number of shipments.

²⁶ Maryland law passed December 26, 1793 (William Kilty, *Laws of Maryland* Chapter 29 of 1794 session). Minutes of directors meetings on October 3, 1797, February 8, 1798, January 6, 1802, and November 23, 1826 (Potomac Company records). August 25, 1817, letter from John Mason to Lewis Sewall and *Draft report of the Treasurer*, June 13, 1827 (Potomac Company records). Maryland act passed January 8, 1803 (*The Laws of Maryland*, Chapter 84 of 1802 Session).

The Va. BPW version of the joint commissioners' report showed Potomac Company salaries totaling \$1,700 being paid to the "treasure and two toll-gathers" for the fiscal year ending August 1, 1822.

²⁷ Corra Bacon-Foster, page 148

The North Branch

During his trip to and from western Pennsylvania in 1784, George Washington made several inquiries about the navigational possibilities for the Potomac's North Branch and its connections to western waters. The year before, the Maryland State Council had sponsored Colonel Normand Bruce and Charles Beatty to perform a survey for essentially the same purpose. Bruce told Washington about possible portages to western waters beginning from where McCullough's Path crossed the North Branch (near present-day Gorman, W. Va.), although Bruce had not yet thoroughly checked out all the water and land routes. A portage to the Cheat River from McCullough's Path would be shorter than one from the mouth of the Savage River, which was 32 miles downstream. The possibility of a shorter portage enhanced the preference for a route along the Cheat instead of the Youghiogheny River.¹

Returning from western Pennsylvania in September 1784, Washington followed McCullough's Path to the North Branch. His inquiries there "could obtain no good account" of the navigation of the North Branch between the path's crossing and Cumberland. However, a Joseph Logston told him that "from Fort Cumberland to the Mouth of Savage river the water being good is frequently made use of in its present State with Canoes and from thence upwards, is only rapid in places with loose Rocks which can readily be removed."²

Had Logston or Washington actually ventured down the North Branch stretch from McCullough's Path to the mouth of Savage River, they would have understood it could not have been tamed by the mere removal of loose rocks. As the North Branch descends through the Allegheny Front in this stretch, it has a gradient of over 40 feet per mile, and has steep ledges that still offer whitewater paddlers Class III and IV rapids, despite a long dammed portion that now forms the Jennings Randolph Lake.³

However, as late as 1789, Washington was still considering North Branch upstream of the Savage River as possibly being improved by canals and locks:

It is, however, supposed by some, not professional men I should add, that the navigation of Potowmac from the mouth of Savage to Stoney river [six miles downstream of McCullough's Path], is impracticable; on account of the many falls, rapid water, and rugged banks which are to be found in its course: But as there is an abundance of water, I should conceive that with the aid of Canals and Locks, it might be accomplished.⁴

The more serious plans ended navigation at the mouth of Savage River and the Potomac Company never performed work upstream of there. The Potomac Company's charters set a goal of making the North Branch navigable as far upstream as the road(s) going to the Cheat River. On New Year's Day in 1788, Washington wrote to Thomas Jefferson that the states of Maryland and Virginia had opened such roads from the mouth of the Savage to Dunkards Bottom on the Cheat.⁵

It is somewhat curious that company records often referred to the upper navigation terminus as the mouth of Georges Creek, and not the Savage River. The town at the mouth of Georges Creek was named "Westernport," whereas "Bloomington" at the mouth of the Savage River offers no clue of it being a port. However, this is a minor point because Westernport is just downstream and around a two-mile bend from the mouth of the Savage River, and is even closer by land distance. A more significant point is that the Potomac Company's upper terminus was 34 miles upstream from Cumberland, the eventual terminus of the C&O Canal. Those that see the B&O Railroad rather than the C&O Canal as the true successor to the Potomac Company would probably note that the railroad took a route along the North Branch to Savage River, which it followed up to the Allegheny Plateau.

According to Thomas and Williams' *History of Allegany County, Maryland*, "Patrick McCarty was the first person that boated from the upper waters of the North Branch of the Potomac. He sent his pig iron and hollow ware to Georgetown." The McCarty family built and operated an iron furnace at Paddytown (later called New Creek, and now Keyser, W. Va.). The infamous Indian chief Killbuck captured and burned Patrick McCarty at the stake in 1755.⁶

Patrick's son, Edward McCarty, continued to run the furnace. He also purchased and cultivated a large tract of land known as Black Oak Bottom, six miles below Keyser, from where he shipped grain, flour, lumber and charcoal downstream. Edward McCarty and his sons played an important role in improving navigation on the North Branch.⁷



Mouth of Savage River—below and the Potomac's North Branch—above, looking upstream.
(D. Guzy)

Further upstream at Westernport, Peter DeVickman (or Devecmon) built a prosperous gristmill in the 1780s. He played a part in clearing the North Branch for navigation so it is most likely that he boated his flour downstream from there. Also in the Westernport and Bloomington area, Notely Barnard made gunstocks and John Brant manufactured muskets and bayonets before and during the War of 1812. They shipped their products by flatboat down to U.S. army in Harpers Ferry.⁸

Captain Thomas Beall of Samuel, the founder of East Cumberland, “sent the first boat from that village.” Beall played a key, but controversial, role in making river improvements.⁹

In 1792, the Potomac Company awarded contracts to Thomas Beall for improving navigation on the Potomac River and its North Branch from Conococheague Creek to Cumberland. The company awarded another contract jointly to Beall and Major Edward McCarty to clear the river from Cumberland upstream to the mouth of New Creek. And lastly, they contracted Peter DeVickman to clear the river from New Creek to Georges Creek. In their August 1793 annual report, the company president and directors expressed optimism over the progress made in improving these sections of the North Branch.¹⁰

Unlike George Washington, who was off serving as his nation's first president, the succeeding Potomac Company officers were less inclined to personally make onsite visits, and relied more on what others told them. The company's president and directors did travel upriver in the fall of 1794 to check on Beall's works; however sickness and high water hindered their inspection. Beall claimed to have finished his contracts, but the president and directors knew enough to complain in their August 1795 annual report: “The several Contracts for clearing the River from New Creek to Cumberland, from thence to Greggs Mill [at Town Creek] and from Greggs Mill to the Mouth of the Conagocheague have not as yet been fully complied with.”¹¹



The Potomac's North Branch just below Cumberland—looking downstream. (D. Guzy)

Beall continued to work on his river improvements over the next few years. In August 1799, when Beall and McCarty's joint contract was still in effect, Beall was responsible for clearing the North Branch from "Thos. Cresups Bottom" (presumably at Oldtown, Md.) to Cumberland, and McCarty responsible for the stretch from "Thos. Cresups Bottom to Lloyd V. Marshall's Mill." In a long series of letters and legal documents, Beall claimed to have completed his work. The Potomac Company disputed Beall's claim.

In an era when "the appearance of a conflict of interest" was not so well appreciated as today, Edward McCarty, Beall's erstwhile partner, joined company director John Templemen and performed two inspections that concluded that Beall's work was not finished in most places, at least not to the company's expectations. McCarty and Templemen's September 1798 report gave estimates for completing navigational improvements along various stretches of the Potomac and its North Branch. Unfortunately, like most Potomac Company accounts, the report did not detail what river improvements had been made. But it did contain a number of interesting observations:

We find that Capt. Beall has done some work since last year and has at some places, set up long stones and sticks, as marks to find the Canals by, but these marks cannot stand long. We took him in at the upper end of Willots Bottom last year and offered him the steering oar, which he refused and to our great surprise he could not tell where some of his Canals lay . . . We were obliged to go in all directions to search out deep water, which was frequently not to be found, and the men were obliged to get out and lift the Boat over the shoals. This was tedious and laborious to the men and destructive to the Boat . . . The Channels were too crooked for a Long Boat to turn in. This circumstance makes it troublesome and dangerous to descend with loaded Boats and particularly difficult for Rafts . . . The work from the mouth of the South Branch up to Cumberland is done nearly as well as the nature . . . will admit . . . for all the water is generally in the Canals, and still there is not a foot in depth. Therefore it is impossible to complete that part of the Contract, according to law, for any sum of money . . .¹²

During 1799, the Potomac Company's dispute with Beall went into arbitration. The arbitrators concluded that Beall had not fulfilled his contracts. However, given that it was "difficult to ascertain with precision what portion of the intended work was done, and that if on such a settlement he [Beall] should become debtor to the Company, it might not be an easy matter to obtain a reimbursement—we [the directors] thought it best and consented to receive what was done, for the money which had been paid . . ." Thus ended the company's "tedious and disagreeable" association with Thomas Beall of Samuel.¹³

Edward McCarty kept a longer and more agreeable association with the Potomac Company. In 1813, McCarty and others loaned the company \$10,000 for further improvements to the upper Potomac and its North Branch "from Coxes Falls [below the mouth of the Little Cacapon River] to the mouth of New Creek." The loans were to be paid off in tolls.¹⁴

That year, 1813, the Potomac Company presented the status of its river-clearing effort in a letter to the Virginia legislature. The "Potowmack Company have long since removed the great obstacles to navigation of the Potomac river from tide water to about thirty miles above Cumberland so as to render the navigation safe and easy for boats with a moderate rise of water and for the last three years have used all means within their power to increase the depth of the water in the bed of the river by making dams in the shallow parts of the river and although considerable progress has been made in effecting that object yet it is not fully accomplished as they wish and the interest of the community requires . . ."¹⁵

Potomac Company records left little information about the navigational structures it built and used on the North Branch. The company treated "river improvements" as generic actions. The reports from the 1820 and 1822 Potomac River surveys added not much more about the specifics of North Branch works. The joint commissioners' report of their 1822 survey only cited a sluice "6 miles above Old Town" and one near Oldtown. One should note that while today the North Branch flows relatively smoothly between Cumberland and its conjunction with the South Branch, early accounts cited numerous falls—at "Cumberland," "Mountz's," "Nicholl's," and "Hector's"—and riffles—at "Beards," "Sap's or Martins," and "Sprigs"—as geographical locations.¹⁶

Thomas Moore's 1820 survey included the stretch from Savage River to Cumberland, but his report's description of it is very general. Moore calculated the North Branch gradient from the Savage River to New Creek (Keyser) to be a "tolerably regular" 23 feet per mile. However, despite whatever river improvements the Potomac Company had made previously, Moore concluded that this stretch "may perhaps be made safe for descending boats 4 or 5 months in the year; but it will always be excessively laborious to ascend with any loading." Moore stated that the 22 miles of the North Branch between New Creek and Cumberland, with a gradient of only 11½ feet per mile, was more navigable. "On this section some money has been very usefully expended, and with a little more improvement, might be rendered navigable for keel boats carrying 100 barrels of flour, 6 months in the year."

For the stretch downstream of Cumberland, Moore concluded:

The work that has been done for the first 9 or 10 miles is not in every part as well designed as I think it might have been; but much better than is usually seen. There has been, however, more money expended on some parts than necessary, and other parts left unfinished, which require the expenditure of a small sum to render the whole in the greatest degree useful. Thence down to the mouth of the South branch, the river has been partially improved, but for want of a little annual attention, many of these improvements are gone out of repair; a moderate sum would place the river from Cumberland to the South branch in a tolerable state for sluice navigation, where there is a sufficiency of water, which perhaps cannot be counted on more than half the year.¹⁷

Unfortunately, the lack of detail in this information leaves us wondering what parts of Beall's and McCarty's river improvement efforts remained in the 1820s, what additional work had the Potomac Company done since, and where should we begin to look today for the ruins of old navigational structures.



The Potomac's North Branch at Oldtown (looking upstream, D. Guzy)

¹ Diary entries for September and October 1784 (George Washington papers).

² Diary entry for September 26, 1784 (George Washington papers).

³ Edward Gertler, *Maryland and Delaware Canoe Trails*, The Seneca Press, Silver Spring, Md., 3rd edition, 1989, pages 46–49.

⁴ Letter to Thomas Jefferson, February 13, 1789 (George Washington papers).

⁵ Diary entries for September 1784 and letter to Thomas Jefferson, January 1, 1788 (George Washington papers).

⁶ Thomas and Williams, *History of Allegany County, Maryland*, Volume 1, page 205

⁷ Michael J. O'Brien, *The McCarty's in Early American History*, New York, 1921, pages 94–96. Edward McCarty (1756–1824) had commanded a Virginia company as a colonel in the Revolutionary War. He and his sons also built roads in Hampshire County, W.Va.

⁸ Harry Steigmaier, et al, *Allegany County – A History*, pages 85–86. Donna M. Ware, *Green Glades & Sooty Gob Piles – The Maryland Coal Region's Industrial and Architectural Past*, Maryland Historic Trust, 1991, page 29.

⁹ Thomas and Williams, *History of Allegany County, Maryland*, Volume 1, page 205. Thomas Beall of Samuel (1744–1823) was a captain in the Revolutionary War. He bought “Walnut Bottom” and “Limestone Rock” (near or in present Cumberland) in 1783, and cleared and laid out the land in 1785. Beall and thirty-four others petitioned the Maryland legislature in 1787 to incorporate the city of Cumberland. (Steigmaier et al, *Allegany County – A History*, pages 70–73). Some accounts used the spelling “Bealle,” but Beall signed his name without the last “e.” The “of Samuel” was appended to distinguish him from other Thomas Bealls.

¹⁰ Potomac Company's August 6, 1792, annual report and report by Philip Fendall, September 6, 1793 (Potomac Company records). On page 85 of her book, Bacon-Foster notes: “About the same time [1792] Edward McCarty was paid 150 pounds Maryland currency for completing the navigation from the upper part of the Ohio Bottom, or lot No. 5, to the still water below Thos. Dameron's by carrying the water by a cut of thirty feet wide.”

¹¹ Annual report, August 6, 1795 (Potomac Company records). On page 92 of her book, Bacon-Foster notes that Beall's 1792 contracts had over-optimistically planned to complete river navigation within one year.

¹² September 7th 1798, “Memorandum of the examination of the work done by Capt. Thos. Beall on the Bed of the River Potomac” by John Templemen and Col. Eduard McCarty (Potomac Company records). “Willot's Bottom” is likely the same as the “Willith Bottom” mentioned as being upstream from Sideling Hill in the “Memorandum of Thos. Beall of Sam'l” dated December 3, 1792 (Potomac Company records) and near “Willet's Falls” cited in the joint commissioners' report of their 1822 Potomac River survey. A stream now called Willet's Run enters the Potomac downstream of Sideling Hill. Note that Bacon-Foster refers to Potomac Company director John Templemen as “Templeman,” and that Edward McCarty became “Eduard” in the aforementioned report.

¹³ January 20, 1800, “Report of the President and Directors to the Stockholders” (Potomac Company records).

¹⁴ August 26, 1799, “Memorandum of Agreement between the Potomack Company & Thos. Beall of Samuel” and minutes of meetings of June 8, 1813, August 2, 1813, and August 1, 1814 (Potomac Company records). Bacon-Foster, pages 114–119.

¹⁵ Bacon-Foster, page 116.

¹⁶ Thomas and Williams, *History of Allegany County, Maryland*, Volume 1, mentioned Cumberland and Mountz's Falls respectively on pages 203 and 205. The “Memorandum of Thos. Beall of Sam'l” (dated December 3, 1792, in Potomac Company records) cited the other falls and riffles.

¹⁷ The printed Va. BPW version of Moore's report said: "The work that has been done for the first 9 or 10 miles, is not in every part as well *designated* . . .", while the version copied by Bacon-Foster in Appendix F of her book said "designed," which makes more sense. The reader should be aware of sporadic variations in words used in different versions of both Moore's and the joint commissioners' reports. See Appendix I and II for discussions of the different survey report versions.

Between the South Branch and the Shenandoah River

The Potomac's North Branch meets the South Branch and forms the main stem of the river a mile or so below Oldtown, Md. The two branches are similar in length and size, and the combined flow at their confluence is about double that of either branch. Between this confluence and Harpers Ferry, the feed from other tributaries makes the Potomac's flow roughly double again. At its mouth just below Harpers Ferry, the Shenandoah River's flow is also about double that of either Potomac branch. So, a boat traveling downstream from Oldtown on the North Branch would see the flow increase about six-fold by the time it passed the mouth of the Shenandoah River, 115 river miles downstream.

This chapter will focus on navigation on that stretch of the river. The next chapter will cover navigation on the upper Potomac's tributaries.

South Branch to Conococheague Creek

Below the mouth of the South Branch, the main stem of the Potomac continues to cut relatively smoothly through the mountain ranges that cross the river. The Paw Paw Bends are still a particularly wild and beautiful section. At Hancock Md., the river reaches its northernmost point and then heads in a generally southeasterly direction into the Great Valley and toward tidewater.



The main stem of the Potomac River at the Paw Paw bends—looking downstream. (D. Guzy)

As discussed in the last chapter, between 1792 and 1799, the crews of Thomas Beall of Samuel worked on improving navigation on the North Branch and main stem of the Potomac as far downstream as Conococheague Creek (at Williamsport, Md.). Just before Beall was awarded his contract, Denton

Jacques had been “engaged to employ hands and clear a small rapid near Fort Frederick called Garrison Falls.” Apparently Jacques’s works were not finished, or did not last long, because Potomac Company records noted Beall working at Garrison Falls at various times. For example, Beall was at these rapids in 1797 when he sent a letter to the company saying he was out of money. Company records in 1812 noted the directors’ desire “to inspect Beall’s Canal near Fort Frederick and, if it is out repair, fix it.”¹

With the exception of “Beall’s Canal,” the Potomac Company’s navigational structures upstream of the Blue Ridge Mountains were generally unnamed and usually just vaguely described as “river improvements.” The records gave little information on the location and construction of these works.

Thomas Moore’s 1820 report (Appendix I) groused about the number of navigational structures in disrepair in the 47 river miles between the South Branch and Hancock. However, his report only specifically mentioned two structures—a “good sluice” at the “Tumbling dam falls” and a poorly located “long sluice made many years ago” at “Bare [Bear] Falls.” Moore’s report cited no navigational works between Hancock and the “long canal” near Harpers Ferry.

On the other hand, the report of the joint commissioners’ 1822 survey (Appendix II) noted about a dozen sluices, wing dams, and “canals” between the South Branch and House Falls. Interestingly, although the joint commissioners’ report also cited the “Tumbling dam falls” and “Bear falls,” it only mentioned fish weirs nearby, not the sluices Moore’s report noted.²

An April 1835 newspaper advertisement indicates that Little Georgetown (in what is now Berkeley County W.Va.) may have been a minor port before the C&O Canal was completed across the river. The advertisement read: “Coal! Coal! Coal! The subscriber has just received two thousand bushels of Stone Coal, from the Allegany Coal Mines, near Cumberland, Md., which will be sold for twenty three Cents Cash per bushel. He also has a large quantity of well seasoned Pine Plank at one dollar per hundred feet. Apply to George H. Dugan near Little Georgetown. April 2, 1835.” The well-seasoned pine plank may have been the wood of the flatboats that delivered the coal.³



Potomac River—left, looking upstream and mouth of Licking Creek—right. (D. Guzy)

Williamsport

Williamsport has been called a “quintessential canal town,” but the area was a center for river commerce long before the C&O Canal was built. Philemon Lloyd’s 1721 map showed an Indian trading post at the mouth of Conococheague Creek site. Later in colonial times, posts at this site supplied the 1736 river survey, the Ohio Company, and troops during the French and Indian War.

By 1791, the Potomac Company’s river improvements helped turn the newly named Williamsport into a thriving river port with grist mills, warehouses, and boat builders. A town merchant declared that year: “as many thousand bushels of wheat came down the river in boats and were unloaded on its bank, and many boats loaded with more than a hundred barrels of flour were sent down the river to Georgetown from this Port.” Grain was also shipped down Conococheague Creek from Franklin County Pa. to the Williamsport mills.⁴

Another reminiscence noted that boats would leave Williamsport after supper and reach Georgetown for the next evening’s supper:

The upward run took two and a-half days, and the round trip on no account (unless by accident) consumed more than five days. . . The boats were built in the streets of the town (at least some of them), but many were built on banks of the creek, near the bridge and also near the mouth of the creek. The tonnage was about one hundred barrels of flour, and freight to Georgetown, one dollar per barrel. Captains carried to the city markets, eggs, butter and poultry. . . Groceries, fresh and salt fish, were brought back on return trip.⁵

Flour was the chief commodity during Potomac Company operations. Whiskey and “stone coal” were also important, as noted in the accompanying newspaper advertisements. These advertisements show that Thomas Kennedy, Joseph Hollman, and the Ardingers were among Williamsport entrepreneurs who owned warehouses and ran boating services. Anthony Stake was another.⁶

Williamsport seems to have made a smooth transition from river to canal navigation. On September 22, 1827, citizens of Washington County met at Williamsport, formed the Washington County Canal Association, and appointed a committee to collect subscriptions. Boats could travel down the Potomac and lock into new sections of the canal as the dams were completed and sections watered. The section below Dam No. 3 was completed in 1833. When Dams No. 4 and 5 were completed in 1834 and the canal watered past Williamsport, it then became a true canal town.⁷

A March 1830 newspaper article depicted river commerce in the interim period before the C&O Canal reached Williamsport. It noted how a rise in the Potomac water levels enabled rafts and boats to come down to Williamsport:

On Thursday we counted 13 gondolas with coal along the bank, averaging about 600 bushels to the load. A large proportion of this was brought down to be delivered, according to contract, to one individual, a proprietor of iron works. The balance was purchased by individuals of this place, chiefly for the market at 15 cents per bushel, or 17 cents including the boat.

We observed only four rafts of boards, pine; besides saw-logs, house-logs, shingles, hoop-poles, locust posts, &C. The rafts of plank were disposed of at 85 to 90 cents. The quality very superior.

A large quantity of wheat, also brought to market by water, was disposed of at 66 cents. To the above articles may be added a lot of Hay, conveyed by a raft.

The river, though falling, is still boatable, and additional arrivals may be expected.”⁸

BOATING OF FLOUR.

THE subscriber will engage to carry any quantity of FLOUR that may be delivered at his WARE HOUSE, before the last day of April next, at one dollar per barrel of Flour, and in proportion for other produce, including all charges till delivered on any Wharf in George-Town.

THO: KENNEDY.

Williamsport, March 20, 1804.

N. B. Flour delivered after the above time will be carried at the current rates.

February 21, 1804 Hagerstown
Maryland Herald & Weekly Advertiser

Boating! Boating!

THE subscriber has that large and convenient Ware-house next to the mouth of the Conococheague Creek in complete order, to receive Whisky, Flour and all kinds of Country Produce, on Storage. He has a good supply of Boats, by which he will convey all the Whisky, Flour, &c. that may be sent to his care, to George-town or any part of the District of Columbia, on the shortest notice, and will be responsible for accidents. He will boat from Jacob Tice's Ware-House, four miles above Williams-Port, in like manner.

He intends purchasing a large quantity of the best Stone Coal that can be procured from the Allegany mountain—From his long experience in that line, he considers himself a perfect judge of that article. Blacksmiths can be supplied, by applying to him in Williams-Port.

JOSEPH HOLLMAN.

February 24.

February 24, 1819 Hagerstown
Maryland Herald & Weekly Advertiser

Boating, Boating!

THE subscriber (formerly a partner of Peter Ardinger, dec'd.) informs his customers and others, that he intends carrying on the Boating business in all its variety. He will receive all kinds of loading, viz. Whiskey, Flour, and every other sort of loading, to convey to George-Town at a moderate price. As he intends to devote his attention particularly to Boating, he hopes to merit and receive a liberal share of public patronage. In the absence of the subscriber, Mr. James Shoaff will receive all kinds of loading, at his Ware-house at the Conococheague Bridge, who has SHINGLES and a quantity of LUMBER on hand.

CHRISTIAN ARDINGER.

Williams-Port, Feb. 3.

N. B. He will carry Flour from Jacob Tice's Ware-house, which will be received by Mr. Tice, at a reduced price.

C. A.

February 10, 1824 Hagerstown
Maryland Herald & Weekly Advertiser

To Farmers, Millers and Distillers.



THE subscriber continues to hold that large and commodious Ware-House, situated near the mouth of Conococheague creek,—where he will store Flour, Whiskey, &c. He is also provided with Boats to carry produce to Washington City or Georgetown, on terms suitable to the times; and will be responsible for accidents that may occur in carriage.

He will deliver Flour in Baltimore much lower than wagon carriage; it would be advisable for millers to turn their attention to that route, as wagons become scarce in the spring and summer seasons.

JOSEPH HOLLMAN.

Williams-Port, Feb. 7. 15—1f.

February 7, 1826, Hagerstown
Torch Light & Public Advertiser

Conococheague Creek to House Falls

The Williamsport boatmen drank whiskey during their trips, but they stayed sober enough to navigate through the tricky rapids and sluices. One such boatman recalled the prominent places along the Potomac as: “Shepherdstown was a clear run, then the shute in Reynold's Dam, head of Harper's Ferry Falls, Bull Ring, Punch Bowl Spring, Hen & Chickens, Rogue's harbor, Horse-pen Culvert, Beaver Dam Culvert, Seneca, Long Acre, White Oak Spring, Big Falls, Stubblefield's Falls, Magazine, Little Falls, Chain Bridge, Granddaddies, Georgetown.”⁹

At what is now Hard Scrabble, W.Va., Joseph Franceway and William Ray established a boating operation from Franceway's plantation. From there they shipped down the Potomac “freights of flour to Georgetown or Alexandria.”¹⁰

The reports of the river surveys of 1820 and 1822 noted that most of the navigational structures upstream of House Falls were in disrepair. We can assume that several, perhaps many, navigational works had disappeared altogether by the time of the 1820 and 1822 river surveys. For example, the Potomac Company's annual report of 1792 noted that a Captain Henry was “clearing the Shepherds Town Falls.” However, in 1820, Thomas Moore could find “no connected channel either natural or artificial” through these rapids. Similarly, the joint commissioners found only “very difficult navigation” there in 1822.¹¹

The Potomac Company continued to make repairs on navigational structures on the upper stretches of the river when it could find funds. As late as 1827, the Potomac Company's annual report stated that there had been some repairs “between the mouth of the Opecon [Opequon Creek] and Williamsport, and between the mouth of the South Branch and Cumberland.” The company also had to ensure that new milldams proposed across the Potomac and its tributaries had sluices or locks to accommodate boat passage. For example, at the Boteler and Reynolds' mill below Shepherdstown, the mill owners proposed a sluice twenty feet wide and sixty feet long along the Maryland shore opposite the mill. Ruins of that mill's dam can be seen today, but not those of the sluice.¹²

House Falls Sluice

Five miles upstream of Harpers Ferry, a rock ledge running diagonally across the Potomac River at Dargan Bend creates House Falls. In the summer of 1769, John Semple built a sluice through House Falls to ship pig iron upstream from his Keep Triste furnace on Elks Run to a forge on Antietam Creek. The Potomac Company maintained and likely improved the sluice. Potomac Company records mentioned “a company of hands under an overseer is now at work at House's Falls” in September 1793.¹³

In its 1808 report to the secretary of the U.S. treasury and again in its 1817 report to the Virginia Board of Public Works, the company noted the three-foot drop at House Falls and the 50-yard sluice there. These two summary reports included the House Falls sluice as one of the Potomac Company's five major navigation works on the Potomac River. We should recognize that the company built works at more challenging rapids, like Paynes and Stubblefield Falls, which were not mentioned in these reports. Perhaps being long-standing and well-designed made the House Falls sluice more noteworthy than the others.

Although the joint commissioner's report generally criticized the Potomac Company's works, it gave the “Cow Ring Sluice” at House Falls a favorable review:

This sluice is formed in the most approved manner, by the assistance of nature, and a ledge of rocks so situated as to throw the collected water of the river into the sluice. With this advantage, the greatest that can be obtained by wing dams, you have the increased rapidity of the current to surmount, which is so great as to require a [capstan], which is placed at the head of the sluice, by which a boat is drawn up slowly, and with much labor.

Today, the sluice and its wall along the West Virginia shore are clearly visible during low water levels. Canoes, fishing boats and the large recreational pontoon craft that ply the deep water above Dam No. 3

regularly use the sluice. The House Falls sluice is among the oldest navigational structures still in use in America.



House Falls sluice, looking upstream. Note rock ledge in background, parallel wall and weir, and ring on the wall. (D. Guzy)

Long Canal at Shenandoah Falls

Just upstream from Harpers Ferry, ledges of Harpers shale running across the Potomac River form a mile-long set of rapids. George Washington and the Potomac Company called these the Shenandoah Falls, but later they would be known as “Harpers Ferry Falls.” Today, whitewater paddlers call these Class II-II+ rapids “the Needles.”

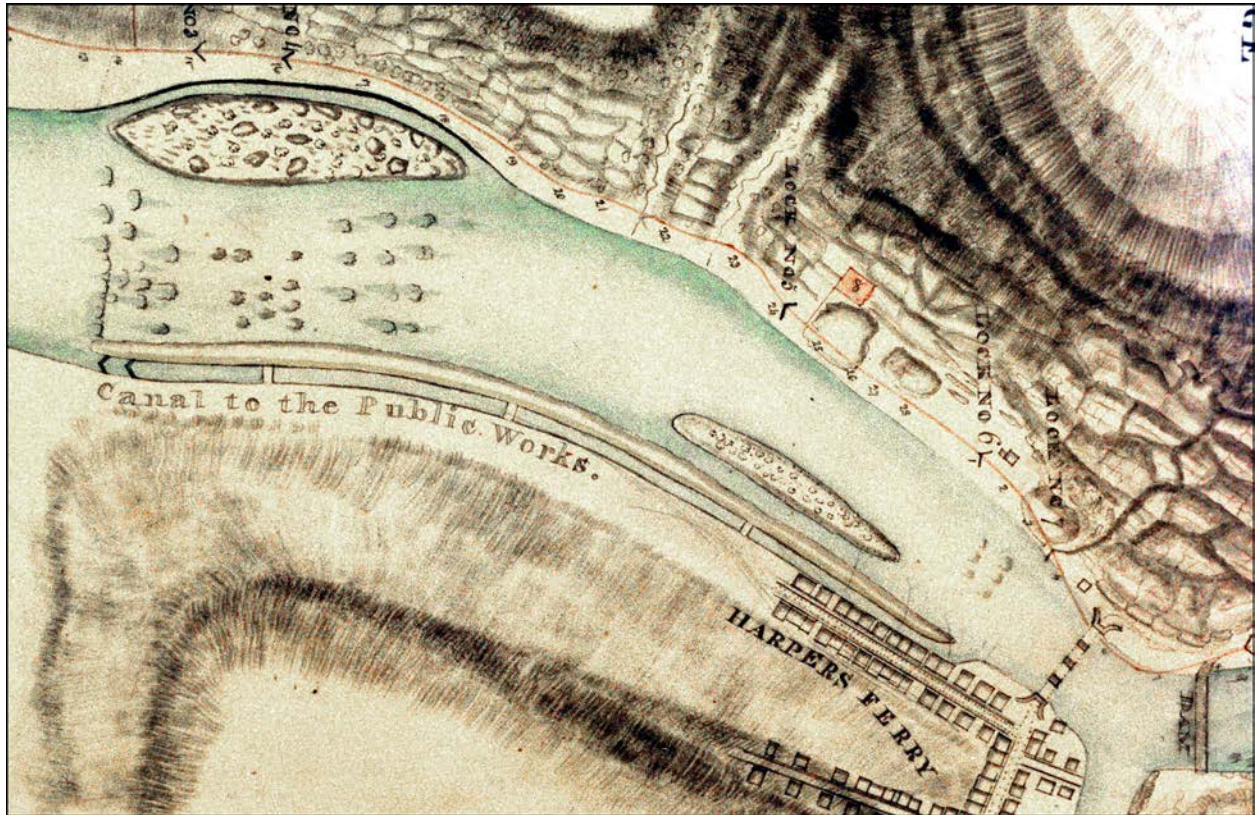
John Semple’s 1769 “Proposals for Clearing the Potomac” noted an attempt to dig out a natural channel between an island and the Maryland shore to improve navigation at the head of Shenandoah Falls. However, the work had not been completed and the channel had filled up with sediment.¹⁴

Washington and the Potomac Company directors inspected Shenandoah Falls by canoe in August 1785. Washington’s diary entry for August 7th suggested the need for river improvements along the Maryland shore for three separate sections through the falls. The uppermost of these would have been through a natural 300-yard semicircular “gut or swash.” This must have followed the island channel noted by Semple. The other sections needing improvement downstream were separated by stretches of “good water.”¹⁵

The Potomac Company began construction of its sluices without locks at Shenandoah and Seneca Falls in 1785. The company would work simultaneously on these two works and the canals with locks at Great and Little Falls for many years, frequently switching work crews from one place to the other.

In June 1788, Washington inspected the works at Shenandoah falls. “Found that the Canal at the head was accomplished, & appeared to be well walled on both sides; and a tow path on the Maryland side for some distance below—but that much of the work remained yet to do.” By January 1790, the work at Shenandoah Falls and other locations was sufficient for company president Thomas Johnson to declare that: “Inland navigation is now constantly performed by Batteaux of ten tons burthen and upwards, from

East Cumberland, and a considerable distance within the South Branch to the Great Falls.” However, in November 1791, crews were still blasting rocks at Shenandoah Falls.¹⁶



Harpers Ferry – detail from James Geddes and Nathan Roberts’ 1827 map (courtesy of National Archives).

The upstream part of the long canal followed the channel between the Maryland shore and the island in the map’s upper left

The Shenandoah Falls works became known as “the long canal,” although this “canal” apparently comprised three separate sluices. The joint commissioners’ 1822 report described the works as such:

To improve the navigation through the rapid, the Potowmac Company has constructed, at great expense, partial channels on the Md. Side, 3 in number. The first with a tolerable level bottom, clear course, 18 or 20 feet wide; and the two others, with very unequal bottoms, and irregular courses, affording an imperfect and dangerous navigation in high water. Along the whole course of these rough passage ways, a broad wall, at the foot of the rocky mountain, which here binds the river, is used for a tow path; along which, boats are dragged up.

Descriptions in the Potomac Company’s records instead seemed to imply a continuous mile-long sluice along the Maryland shore (see Appendix III). These records also stated that the Shenandoah Falls works had a total fall of 15 feet. But the reports of the 1820 and 1822 Potomac River surveys respectively gave fall heights of 26.75 and 27 feet “from the head of Shenandoah falls, to the landing at Harper’s ferry.” The landing was at least a half mile downstream from the foot of the Potomac Company’s works, and perhaps the two surveys accounted differently for the head of water at the dam feeding the long canal than had earlier measurements.¹⁷

The Harpers Ferry Armory, and the Armory Dam and Canal that fed its waterwheels, were constructed about the same time as the long canal. The initial Armory Dam (also called the “Potomac Dam” and “the United States Dam”) was completed by May 1801, and served to feed both the Armory Canal and the Potomac Company’s long canal. Replacement dams were constructed in 1809 and in 1820

through 1821. After 1833, the dam and its upgrades would feed the C&O Canal and become known as “Dam No. 3.”¹⁸



Harpers Ferry Armory Canal (looking downstream from near upper entrance, D. Guzy)

Because the Armory Dam fed the long canal as well as the Armory Canal, the long canal would drain waterpower supplies to the Armory. During the droughts of the 1820s, James Stubblefield, the Armory’s superintendent, had temporary dams built at the head of the long canal to raise the level of water at the dam. In June 1826, the Potomac Company granted permission to Stubblefield to fix a permanent lock gate at the head of the long canal. The Potomac Company’s treasurer’s inspection of the gate in 1827 found it difficult for boatmen to enter and suggested extending the entrance to the long canal upstream. Stubblefield agree to modify the gate in 1828.¹⁹

Contemporary maps gave little information about the long canal. Abert’s 1825 map and Geddes and Roberts’ 1827 map showed proposed routes for a new independent canal along the Maryland shore, but did not specifically point out the existing Potomac works. Both maps showed an island near the Maryland shore just below the location of the Armory Dam, as does John Wood’s 1820 map of Jefferson County. Wood’s map labeled the channel between the island and the shore as “Canal.” This must have been the upper section of the long canal.²⁰

The island has since washed away, or the C&O Canal altered it. Most historians agree that the construction of the C&O Canal completely destroyed the long canal. Unlike the other major works of the Potomac Company, we do not have ruins at the Shenandoah Falls to complement the sketchy information we have about its design. So the details of the long canal of the long canal’s design remain somewhat of a mystery today.

¹ Minutes for August 6, 1792, and November 3, 1812, meetings. Memorandum and letter to the Potomac Company from Thomas Beall of Samuel, dated respectively December 3, 1792, and September 4, 1797 (Potomac Company records). Garrison’s Falls were downstream of McCoy’s Ferry, and are now covered by the slack water behind the C&O Canal’s Dam No. 5.

² Gilpin and Smith’s 1789 survey (see table in this book) placed the Tumbling Dam Falls 11¹/₈ miles below Town Creek, and Bear Falls 7⁷/₈ miles below the lower end of Tumbling Dam Falls. Before independent still-water canals became commonplace, the term “canal” was also used to describe river channels.

³ “History of Little Georgetown,” *The Berkeley Journal*, Issue 14, 1990, Berkeley County Historical Society (pages 20-21) referenced the April 1835 *Martinsburg Gazette* advertisement.

⁴ Williamsport Chamber of Commerce, *Williamsport and Vicinity Reminiscences*, Williamsport, Md., 1933, page 22

⁵ *Williamsport and Vicinity Reminiscences*, page 70.

⁶ Stake is mentioned in Thomas J. C. Williams, *A History of Washington County*, 1906, page 64. Joseph Hollman also built C&O Canal Dams No. 4 and 6 (Ref. Harlan D. Unrau, *Historic Resource Study: Chesapeake & Ohio Canal*, Hagerstown, Md., 2007, pages 199 and 242). Thomas Kennedy (1776-1832) owned a mill on Conococheague Creek before he built his home in Williamsport in 1804. He was a merchant, lawyer, poet, postmaster and member of the Maryland House of Delegates. Although born in Scotland and did not personally know any Jews, Kennedy fought a long but successful fight for the political rights of Jews in Maryland.

⁷ *Williamsport and Vicinity Reminiscences*, page 24. Unrau, pages 202 and 204.

⁸ The excerpt is from the March 13, 1830, *Williamsport Republican Banner*, republished in March 26, 1830, *Hagerstown Mail*.

⁹ *Williamsport and Vicinity Reminiscences*, page 70

¹⁰ "History of Buttstown and Scrabble Areas-Early Members of the Catholic Church," *The Berkeley Journal*, Issue 13, 1989, Berkeley County Historical Society, page 3.

¹¹ Minutes for August 6, 1792, meeting (Potomac Company records). Today the Potomac River is smooth and deep at Shepherdstown and above, so the "Shepherds Town Falls" must have been the rapids downstream, at what has been called "Pack Horse Ford" and "Boteler's Ford."

¹² September 18, 1826, "Report on proposed dam of Messrs. Boteler & Reynolds" sent to Mr. Bernard (Potomac Company treasurer) and August 1827 annual report (Potomac Company records). Also, Bacon-Foster, pages 146-149. It is likely that the sluice was removed and the dam altered while, or after, the C&O Canal was built. Boteler's Mill first ground flour and later hydraulic cement, which was shipped into the C&O Canal via a river lock near Shepherdstown.

¹³ House Falls were likely named for John House, an early landowner on the Maryland shore. For more information on the sluice, see "1769 Sluice Still in Use" by Dan Guzy in *The Tiller*, Fall 2002, Virginia Canals & Navigations Society.

¹⁴ Nute, page 501.

¹⁵ Diary entry for August 7, 1785 (George Washington papers).

¹⁶ Diary entry for June 2, 1788 (George Washington papers). January 16, 1790, letter from Thomas Johnson to Virginia Governor Randolph (William P. Palmer, editor, *Calendar of Virginia State Papers and Other Manuscripts*, Vol. 5, New York, Kraus Reprint Corp., 1968, pages 99-100). Nute, pages 717-718.

¹⁷ Gilpin and Smith's 1789 survey (see accompanying table) opted not to specifically measure the fall at Shenandoah Falls. Instead they measured a fall of 43 feet from the head of Shenandoah Falls to the lower end of the island at Paynes Falls, five miles away.

¹⁸ David T. Gilbert, *Waterpower*, Harpers Ferry Historical Association, 1999.

¹⁹ "Draft report of the Treasurer in obedience to the resolutions of the Board of August 9, 1826 and June 13, 1827" (Potomac Company records). *Records of the War Department, National Archives and Records Service*, Washington, D.C.: 1957-1958, Reel 21, Volume 9, Page 935 and Reel 22, Volume 4, Page 374.

²⁰ John Wood's 1820 map of Jefferson County can be viewed on the Library of Virginia's website (www.lva.lib.va.us/) and searching for Board of Public Works or by selecting <http://bit.ly/mB6IMG>.

Tributaries and the South Branch

At the start of the nineteenth century, the Potomac Company's plans began to emphasize extending navigation to the Potomac River's major tributaries rather than pursuing the original goal of establishing trade routes into the Ohio Valley. The National Road, authorized in 1806, would offer an alternative overland route from Cumberland to the West. The Potomac Company was looking toward more immediate means to increase toll revenues, particularly from the mills developing along the Potomac's feeder streams.¹

The Potomac Company considered improving and using the South Branch and several Potomac tributaries for navigation. In its 1808 response to the secretary of the U.S. treasury, the Potomac Company summed up the extent of navigation on these streams as:

The Monocacy 40 miles—Pattersons Creek 20 miles—the South Branch 100 miles—Cape Capecon 20 miles—the Opecon 25 miles—the Shanandoah from Port Republic to its mouth 200 miles—on the north Fork (which branches at 60 miles from the Mouth) by Stovers Town, 60 miles. It is further believed, that one day the navigation may be extended from Port Republic by the middle Fork to the Mouth of Lewises Creek, 20 miles and, within 6 miles of Staunton; and thence by Lewis's Creek to Staunton.²

However, this response went on to clarify: "Nothing has yet been done in the upper part of the Conogocheague—on Pattersons Creek—on the South Branch—on Cape Capecon—on Opecon, or on the Shenandoah above the great Fork." The company made a similar statement in 1817, indicating that it likely never implemented its plans for improving these tributary stretches.³

On the other hand, the Potomac Company did complete river improvements on the Monocacy and Shenandoah Rivers, and on the lower part of Conococheague Creek. It also began, but aborted, an effort to make Antietam Creek navigable.

In 1821, the Virginia legislature passed a resolution for its principal (or "public") engineer to survey the Potomac's South Branch, Great Cacapon River, North River, and Patterson Creek. In 1823, after replacing the deceased Thomas Moore as principal engineer, Claudius Crozet completed these surveys. Crozet's reports described the state of navigation on those streams and gave estimates of what might be done as improvements. These improvements apparently never were implemented.

Between 1849 and 1854, locks and bypass canals were constructed along Goose Creek by the Goose Creek and Little River Navigation Company. However, actual navigation on the creek was apparently limited to a single demonstration run.

The following will describe more thoroughly navigational efforts on the upper Potomac's tributaries, following their order going downstream.

Patterson Creek

Patterson Creek enters the North Branch ten miles downstream from Cumberland and was the furthest upstream of all of the tributaries that the Potomac Company considered for navigation. Washington's 1754 survey of the Potomac River began its assessment of the river's navigational potential at the mouth of this creek.

Neither the Potomac Company nor the Commonwealth of Virginia made improvements to Patterson Creek. However, the creek saw some navigational use, as reported in Claudius Crozet's 1823 report: "In a swell, boats can navigate this creek from Frankfort down to its mouth, with a load of 120 barrels of flour. It is said to be navigable from two to three months in a year. There is no obstruction worth noticing below the town."⁴

The South Branch

The Potomac's South Branch begins as three forks that converge into one main stream above Moorefield, W.Va. Some sections in the upper parts of the three South Branch forks have significant rapids (Class III or IV). However, the lower 75 miles downstream from Petersburg, including the approximately 58 miles between Moorefield and the South Branch's confluence with the North Branch, have nothing more spectacular than Class I and II rapids, and are easily canoed.

John Ballendine considered the South Branch in his navigational schemes. His 1773 map of the Potomac and James Rivers included the South Branch and Lunice Creek (which he labeled as "Luney's Creek"), a tributary to the west of Petersburg. The map showed a 20-mile portage, a "Waggon Road," between Lunice Creek and the Cheat River. It also showed a shorter 11-mile portage to the Cheat from near the head of the North Branch.⁵



The Potomac's South Branch at the upper entrance to the Trough—looking downstream. (D. Guzy)

George Washington, who had surveyed land along the South Branch in 1748, advocated navigation on the branch. In 1784, referring to observations made by others, he wrote: "... the navigation of the South Branch in its present State, is made use of from Fort pleasant to its Mouth ... the most difficult part in it, and that would not take £100 to remove the obstruction (it being only a single rift of rocks across in one place) is 2 Miles below the old Fort." In 1785, Washington wrote that the South Branch could "with great ease be made navigable 100 miles." And, in 1791, he claimed that the "South branch of Potowmac ... for a hundred miles of its extent, may be made navigable for ... much less" than £2,000.⁶

Although the Potomac Company initially established toll collections at the mouth of the South Branch and repeated Washington's claim that the branch was (or could be) navigable for 100 miles, it apparently did nothing to improve the branch's navigation and made scant mention of commerce from it. One exemption was a statement by Thomas Johnson in 1790 about batteaux coming from "a considerable distance within the South Branch." When William Taylor petitioned the company for permission to build

a dam at his saw mill on the South Branch in 1822, the company referred this “to the Principal Engineer of Virginia to say whether the erection of such would be injurious to the Navigation it being expected that he [Thomas Moore] will be at the site soon.”⁷

Around 1818, William Fox erected a merchant mill in Fox’s Hollow, near Mechanicsburg on Mill Creek, which enters the South Branch just upstream of Romney. Local history noted that: “Large quantities of flour were shipped from this mill to Georgetown by boat. Boats for this purpose were built in a yard near where Franklin Herriott now lives.” Several other mills, furnaces, distilleries and tanneries were built along the South Branch. “From Moorefield and lower points of the fertile valley of the South Branch, flatboats floated down to tidewater on the Potomac with flour and iron from Hampshire [County], beginning at an early period and continuing until about 1830. The principle markets for flour were Washington and Alexandria.”⁸

When Claudius Crozet surveyed the South Branch in 1823, he concluded that the gap two miles below Petersburg would be its highest point of navigation. However, Crozet believed that the South Branch, like the North Branch, was navigable only for a few days each year, during freshets. And because the South Branch “would admit no permanent improvements” he suggested that a “lateral canal was the only mode to procure a safe and constant navigation in the valley.”⁹

The South Branch was surveyed at least once again by Charles B. Shaw, principal engineer, as attested to by an 1835 survey map that now resides in the Library of Virginia. However, there apparently were never any real navigational improvements made on the branch. It is telling that the C&O Canal never constructed a river lock near the mouth of the South Branch to receive boats coming down it.¹⁰

Cacapon and North Rivers

Despite their names, Cacapon River and its tributary, North River, are more like creeks than rivers. Conococheague Creek has greater flows. The Cacapon has ledges near its mouth that make paddling into the Potomac tricky today. Nevertheless, this “river” had some navigational use.

Flat boats and rafts transported iron downstream from the iron works at Bloomery Gap, near the Forks of Cacapon. Presumably Robert Sherrard’s “large stone-mill” and . . . woolen-mill” at Bloomery Gap, and other mills along the Cacapon and North Rivers, also made some use of river navigation.¹¹

When Claudius Crozet surveyed the “Great Capehon” in 1823, he noted: “Some rafts indeed have, in time of freshets, descended the river from the fork; but numerous wrecks attest the dangers of this only temporary navigation.” Crozet’s report recommended improvements to Cacapon and North Rivers that totaled \$2,810, to “secure the descent of rafts and boats in ordinary swells.”¹²

Conococheague Creek

Franklin County, Pa. history books say that boats carried grain down Conococheague Creek to the Potomac from at least as far upstream as the confluence of the creek’s East and West Branches. In discussing a town proposed at this confluence in 1787, but never built, one account stated:

A wharf and a warehouse were erected at the site of this [proposed] town many years ago, and wheat and other grains purchased and floated down the Conococheague in flat boats to the Potomac and by that river to Georgetown, which was then the principal market for the products of this region of the country. The erection of mill dams on the creek interfered with this trade, and it was long ago abandoned.¹³

The Potomac Company’s first attempt to open any Potomac tributary for navigation was on Conococheague Creek. This creek’s only major obstruction to navigation was, as it is today, the milldam at Swingleys (or Swingles, Swindleys, and now Kemps) Mill, about three and a half miles upstream from its mouth.

In what the company must have (mistakenly) thought to be a quick and easy task, it agreed to award a contract for a lock at Swingleys Mill in June 1795. The lock was never completed and, beginning in 1798, the company's accounts referred to a proposed "chute" rather than a lock at the milldam. Finally, in August 1803, the company directors noted: "there has been a Chute placed in Swingleys Milldam upon the Conococheague [sic] to facilitate the passage of vessels in the Creek." The chute was presumably a sluice without locks, or possibly one with only a simple flash lock.¹⁴

Also in 1803, the Governor of Pennsylvania signed an act enabling him to "incorporate a company for opening the navigation of Conococheague (sic) Creek from the mouth of the falling spring in the town of Chambersburg to the Maryland line." However, there seems to have been no action by such a new company, if it ever was formed.¹⁵

The chute at Swingleys Mill must have remained effective because as late as 1817 the company was stating that the creek was navigable for 15 miles. (Following the many bends of Conococheague Creek, the Broadfording, Md., area is 15 miles from the creek's mouth. However, by following a straight line, the confluence of the creeks branches in Pennsylvania is only 10 mile from the mouth.) The Potomac Company's records indicated a desire to clear the creek further upstream, perhaps as far as Chambersburg on the West Branch, but did not detail any actual effort for this purpose.¹⁶

Later, others considered connecting Conodoguinet Creek in Pennsylvania to the headwaters of Conococheague Creek, thus creating an all-water route between the Susquehanna and Potomac Rivers that would link Harrisburg, Pa., with Washington, D.C. On April 11, 1825, the Pennsylvania legislature passed an act to have canal commissioners survey potential canal routes through Cumberland and Franklin Counties. By 1826, these commissioners had recommended a Conococheague to Conodoguinet Canal. However, the development of railroads made the canal obsolete before any such work began.¹⁷

Today, the milldam at Kemps Mill (formerly Swingleys Mill) is a 13-foot concrete-covered structure, which has been breached since 1998. There appears to be no trace of the chute built by the Potomac Company there. The mill, which once served as a night club, is now a private residence.



Kemps Mill, formerly Swingleys Mill, on Conococheague Creek—looking upstream. (D. Guzy)

Antietam Creek

The Potomac Company did not initially include Antietam Creek among the tributaries considered to be candidates for navigational improvements. In 1811, however, merchants solicited the Potomac Company and promised to loan money for an effort to open navigation on the creek, and thus improve their trade with Washington, D.C. The goal was to make the Antietam navigable from its mouth “to the Pennsylvania line at all seasons for Boats of at least one hundred Barrells (sic) of flour burden.”¹⁸

In January 1812, the Maryland legislature passed an act extending the rights of the Potomac Company beyond the Potomac itself, allowing it to condemn lands along the Monocacy, Conococheague, and Antietam “for the purposes of making canals and locks in improving the navigation on such branches.” The Potomac Company’s works on the first two streams had long been completed and likely involved no lock construction. So the proposed Antietam Creek plan must have been the real driver for the 1812 act.¹⁹

The Antietam project would be unlike any the Potomac Company had undertaken before. The company viewed the almost twenty milldams across the creek as navigational opportunities, each raising stream levels over natural obstructions upstream of the dams. The effort would convert millraces into boat canals (enlarging them and adding new segments where needed) and install locks to raise and lower boats. The Potomac Company had built only a total of thirteen locks before, preferring to construct sluices without locks wherever possible. On Antietam Creek, it planned to build twenty-one new locks.

The work on the Antietam began relatively quickly in 1812. Josias Thomson, the Potomac Company’s “general superintendent of works” since 1810, had the overall lead. The company also appointed John Ragan as superintendent of the Antietam works and hired Thomas Harbaugh to make “Lock Gates and other works.” In an April 1812 advertisement notifying Antietam Loan subscribers that their first installment was due, Thomson optimistically stated that he had “already contracted for a number of the locks—the work is progressing, and will be finished at an earlier period than was originally contemplated.”²⁰

The report of Potomac Company’s annual stockholders meeting held in August 1812 summarized the status of the project: “The farmers and merchants on Antietam Creek have agreed to loan the Company twenty thousand Dollars at an Interest of 6 per cent to be expended in making the Creek navigable which it is believed sufficient for that purpose. But should this sum not be sufficient, they are willing to increase the loan, the principal and interest of the money loaned by them to be paid and refunded out of the tolls on produce, etc. which shall descend that creek in no other way. Contracts have been entered into for the building of ten locks on the Antietam, nearly all of which have been commenced.” Work on almost half of the planned locks had begun.²¹

The report of the next annual meeting stated: “The works on the Antietam have been regularly progressing, but not so rapidly as was expected and might be wished, owing principally to the difficulty of procuring workmen and labor in that country.” However, financial, not labor, problems would lead to the downfall of the Antietam project. The subscribers to the Antietam Loan (consolidated at the Bank of Hagerstown) suspected gross cost overruns and refused to pay their loan installments. The War of 1812 and subsequent loss of the British market for flour also must of dampened investors’ enthusiasm and commitment.

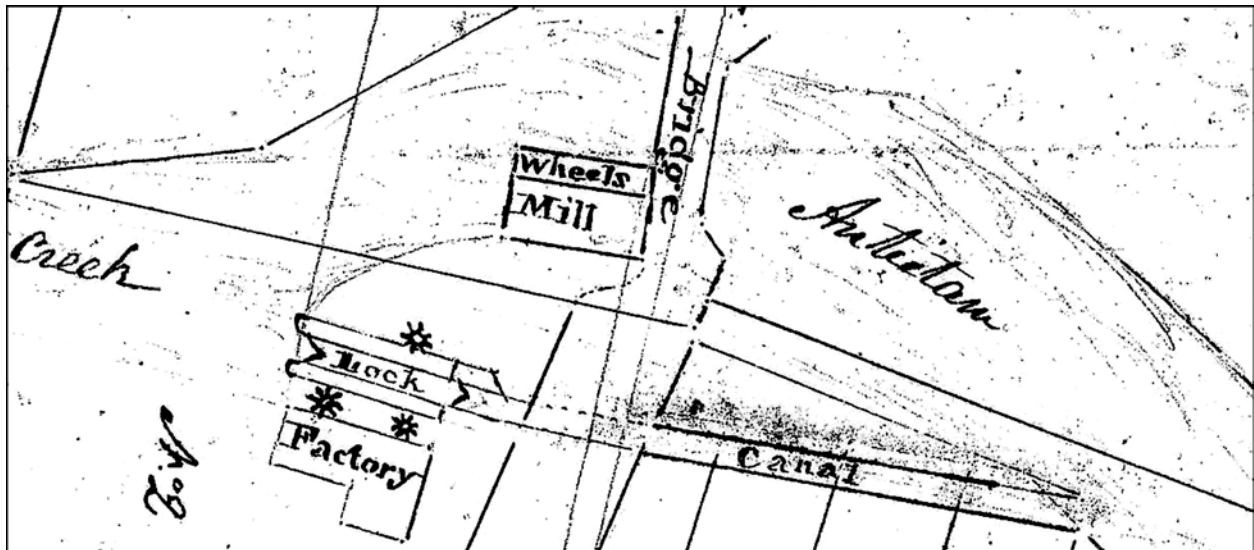
The Potomac Company directors met with subscribers in Hagerstown in November 1813 to work out measures for a “speedy completion” of the work. They hoped to find a separate company to which they could transfer the Antietam project, as they had for the Shenandoah River project. But there were no takers and the Potomac Company failed to resolve its financial problem. So in March 1814, it suspended Antietam operations and dismissed Thomas Harbaugh.²²

The unpleasant aftermath of the Antietam works suspension included Harbaugh and Ragan charging Josias Thomson of “misconduct and mismanagement.” The Potomac Company directors investigated and concluded that the charges against Thomson were “groundless and without foundation.” The Potomac Company blamed the delinquent payment of loans as the cause for the Antietam project failure. However, one must note that the company originally promised to make the Antietam navigable with a loan of \$20,000, whereas Harbaugh later estimated the total cost to be \$100,000—five times the original loan.²³

The suspension of the Antietam project continued through 1814 and 1815. The company placed notices in local papers in May and June 1815 soliciting proposals for completing the navigation on Antietam Creek, but again there were no takers. The company's minutes of its August 1815 annual meeting implied that the Antietam project was dead.²⁴

In 1818, Thomas Harbaugh wrote a memorandum to the Potomac Company describing not only every canal and lock planned along Antietam Creek, but also the mills and dams as well. See the accompanying table for a summary of information from Harbaugh's memorandum. This shows that the effort would have taken advantage of nineteen milldams, two of which were not finished in 1814 when work stopped.

In most cases, the Antietam plan called for converting millraces into canals and placing a lock at the end of each canal. Harbaugh noted that the races were "generally long, narrow and crooked, winding round the rocks to avoid the expense of blowing," and thus expensive to modify for navigation. Harbaugh also thought the company's plan to extend navigation through the upper four dams was impractical. While stone had been cut for many of the locks and a few locks were "commenced," only the canal and lock at Henry Shafer's mills and factory in Funkstown were fully completed before the Antietam effort stopped.²⁵



Canal/millrace and lock at Funkstown, former site of site of Henry Shafer's mill on Antietam Creek.
(Courtesy of Western Maryland Room, Washington County Free Library)

Funkstown local history says that at least one boatload of flour was shipped through the lock at Henry Shafer's mills, but this seems to be more legend than fact. With the canals and locks unfinished downstream, there would have been no practical reason to build a boat and ship flour for only a short distance.²⁶

After abandoning the Antietam project in 1814, the Potomac Company reassigned Josias Thomson to supervise the construction of the new stone locks at the Little Falls on the Potomac. The new Little Falls project also struggled financially and within two years the company suspended work there and dismissed Thomson.

Today, there is little to see from the aborted Antietam Creek effort. The mills at Funkstown went through major modifications and there seems to be no trace of the millrace/canal there. Perhaps the best surviving mill ruins, including a dam and millrace, are the Antietam Iron Works, just upstream from the stone bridge crossing the creek near its mouth.

Thomas Harbaugh's Description of Antietam Creek Canals, Locks & Mills

(Ref. Thomas Harbaugh's *Memorandum of the Antietam Creek*, in the Potomac Company records)

Mill owner and type	Miles from previous	Dam fall (ft)	Proposed or constructed navigational structure	Lock lift (ft)	Side of creek
Col. Daniel Hughes—Rock Forge—near Pa. border	—	10	proposed canal around dam and past obstructions for 400 yards below—proposed a lock	15	east
Christopher Burckhart — merchant and sawmill	1 ½	5 ½	“commenced” canal and lock	5 ½	west
John Russell—merchant mill	1	4 ½	proposed ½-mile canal and lock cut below mill	8 ½	east
Christian Lantz—merchant mill	1	4	proposed a “long canal” and lock	8 ½	east
Col. Daniel Hughes—forge, furnace & mills	2	12	proposed to widen existing race—noted obstruction between here and Rock Forge Dam—proposed a lock	12	east
Jacob Rohrer—merchant mill & sawmill	2	6	proposed to widen mill rack and place lock at “end of mill”	6	east
John Rohrer—merchant mill	2	4	Proposed canal and lock	7	east
Henry Miller—paper & sawmill	1	4	proposed lock and canal—stone cut for lock	4	east
Messrs. John & George Harry—one mile from Hagerstown	2	5	canal and lock seats dug out—stone cut—gates, sills and iron made but wood and iron items not at site	6	east
Gerhart Buckwalter—sawmill	¾	3	proposed a lock—dam was built during the Antietam work	3	east
Henry Shafer—merchant mill, saw mill & factory, at Funkstown	1 ½	7	300-ft, 17 ft-wide canal and lock “all finished”—walls support bridge for “the main street of Funkstown”	8	east
Christian Bashler [Boerstler]—small powder mill & woolen factory	½	1	proposed only a “sluice gate” due to small fall (i.e. no lock)	1	
Messrs Clagets—merchant mill and sawmill	1 ¾	6	proposed following the millrace and then turn to right with a long canal and lock	8	west
John Sharrer—merchant, saw & hemp mills	1 ½	6 ½	proposed a 150-yard canal and lock	8	west
Benjamin Emmert	4	3 ½	proposed a lock here if no long canal built past Chaney Falls (see next)—dam built after Antietam effort began	3 ½	east
Col. Daniel Hughes— no dam then— at Chaney's Falls	½	9	proposed canal and lock, beginning at Emmert's dam and going past Falls. Or, a 12½-ft.dam could raise water to Emmert's, and then a canal and lock be built around the dam	9	east
John Shafer—merchant mill & sawmill	2 ½	9	proposed to make millrace into a canal and lock	9	west
John Booth—merchant mill & sawmill	1 ½	8	proposed to make millrace into a canal and lock	8	west
possible new dam, lock & canal			“it might be well to add . . . another lock and canal” between Booth and Mumma's Dams	6	
Jacob Mumma—merchant mill & sawmill	7	9	proposed “perhaps . . . the shortest canal” and lock here—stone cut for lock	9	west
Messrs McPherson & Brien—forge, furnace, “etc.” [Antietam Iron Works] - 350 yds from mouth of the creek	4 ½	13	proposed to convert race to a 150 yard canal and build two locks—“works commenced,” but not completed—dug out lock seat and set the lower sill—cut stone for works and built some walls— made sill for second lock	19 ½	east
Total	38 ½		“21 locks and 1 sluice gate” Total fall between Pa. border and Potomac, including stretches with no dammed slack water = “224 feet”	164 ½	

Shenandoah River

The Shenandoah River, the Potomac's largest tributary, was undoubtedly the Potomac Company's number one choice of "feeder streams" to open for navigation. Its main stem and two forks ran hundreds of miles through the grain-producing Shenandoah Valley of Virginia.

In October 1784, on his return trip from Pennsylvania, George Washington visited people on the upper reaches of the Shenandoah River. He concluded: "The South [Fork], or principal branch of Shannondoah at Mr. Lewis's [near Port Republic] is, to traverse the river, at least 150 Miles from its mouth; all of which, except the rapids between the Bloomery and Keys's ferry, now is, or very easily may be made navigable for inland Craft."²⁷

The Virginia legislature attempted to establish an independent navigation company for opening the Shenandoah River for navigation, but failed. So in 1802 and 1803, it granted a charter to the Potomac Company for that purpose. In January 1805, after obtaining the necessary start-up loans, the company assigned Leonard Harbaugh to lead the Shenandoah River effort.²⁸

In the summer of 1805, Harbaugh had a boat crew check out the Shenandoah from Harpers Ferry to Port Republic on the South Fork. The Potomac Company focused its efforts toward overcoming the rapids in the river's lowest five miles, the stretch just above Harpers Ferry. The company erected a series of five canals with a total of five locks, all along the left bank of the river. Harbaugh managed to do this in only two years, a remarkably short period compared to that needed for other Potomac Company works. Leonard's son, Thomas, assisted in this effort. Thomas Harbaugh became the toll collector for the Shenandoah River works before working on the Antietam Creek project.

In summarizing the extent of navigation on the Shenandoah River in 1808, the Potomac Company president said the river was navigable from "from Port Republic to its Junction with the Potomac." Note that this statement did not cover the smaller North Fork of the Shenandoah. Work to open the North Fork and further improve the South Fork would commence later.²⁹

The Potomac Company was unable to gather enough capital from new loans and lottery proceeds to fully support navigation improvements to the upper stretches of the Shenandoah River. In 1816, after years of bargaining, the Potomac Company sold its Shenandoah works and rights to the New Shenandoah Company. The new company's first navigational clearing contracts focused on the South Fork, and later contracts addressed the North Fork. Test runs between Port Republic and Harpers Ferry in 1822 and 1823 convinced the company's directors that navigation was a success. However, the directors recommended further work at fourteen sites and the addition of beacons along the course. They also recommended that milldam owners provide ropes and windlasses to assist upstream travel. Records of the New Shenandoah Company indicate that navigation on the Shenandoah's North Fork was extended to up to the dam at Pennybakers Mill by May 1832.³⁰

Fish weirs and milldams were obstacles on the Shenandoah. This led to legislation in 1840 requiring owners to remove dams, or add sluices to enable navigation.

One account of boating on the Shenandoah River between 1830 and 1840 said:

Zack Raines . . . and a number of others made their living by boating to Harper's Ferry. There—the flour having been disposed of—the boats were sold for the lumber in their construction, and the boatmen would walk back to their homes.

The floatboats used were made of heavy undressed lumber, and were guided by rudders at each end. At the dams in the river, next to the shore, chutes were placed, constructed of strong timber, for the passage of the boats. When the rise in the river was sufficient, the boats would go over the dams.³¹

Harpers Ferry served as a terminus for Shenandoah River navigation after the B&O Railroad and C&O Canal reached that town. Lumber was salvaged from the "gundalows," or flatboats, some of which can still be seen as timbers in local houses. However, boats and their cargos could continue onto the C&O Canal, by crossing the Potomac River and entering into the canal river lock built opposite Harpers Ferry.

Jacob Sipe, a boat builder and shipper in Rockingham County, advertised in January 1841 that the previous year he had taken 5,623 barrels down the South Fork and main stem of the Shenandoah River, and through the Shenandoah River locks. Sipe charged \$1.25 per barrel to ship flour from Mount Crawford to Georgetown and \$1.20 from Port Republic to Georgetown. The charge to ship flour just to Harpers Ferry was \$1.00 per barrel.³²

Iron was another Shenandoah River cargo. In an account written around 1900, a fellow recalled witnessing in his youth an iron boat wreck near Shenandoah City, plus other details of Shenandoah River navigation:

[W]e heard that the fleet was in Kite's dam, so my grandmother took me to the High Rock to see the boats come through the shoot. We got in sight just in time to see the first boat go thro, strike a great rock, split in twain, and the whole cargo of pig iron went to the bottom. Each boat was manned by six men, and when the boat broke those on it were carried to such deep water that they had to swim. There were 18 boats in this fleet, and soon the men began to wade in and gather the iron together in a pile. The broken boat was then taken to the bank and repaired, reloaded and started on its way again. This was in March, I think, so you can see that a River sailor had his perils and hardships. . .

Nearly all boats were provided with tin horns about 8 feet long, and when they would start from stations on the River, all would blow. War songs were the favorite tunes, and the music they made would make your hair stand on end. These horns could be heard for five miles.

A Shenandoah River survey begun by Claudius Crozet in 1831 and finished by James Herron in 1832 considered the possibility of lock and dam navigation on the river, but nothing came of this. C&O Canal engineer C.B. Fisk headed another Shenandoah canal survey in 1848. However, the work was done by a subordinate, and again nothing became of the survey. Eventually, the building of the Valley Turnpike, railroads, and even the James River and Kanawha Canal drew commerce away from navigation on the Shenandoah River.



Upper end of lower lock at Shenandoah River's Little Falls. (D. Guzy)

Appendix III includes a summary of descriptions of the Potomac Company's canals and locks along the lower Shenandoah River. Remnants of these structures are along the left (western) shore, with the locks and canal at Little Falls at Millville, W.Va. being in the best condition. Except for portions of the old canal that run through Virginus Island at Harpers Ferry National Park, the ruins of these navigational structures are on private land, or along the railroad tracks. To see these, one should get permission to avoid trespassing by land, or else brave the Bull Falls (Class III) and Staircase (Class II) rapids on the lower Shenandoah by boat or raft.



The sparse remains of the canal without locks at the Shenandoah River's Bull Falls—flow is toward the left. (D. Guzy)

Monocacy River

The Monocacy River is Maryland's largest non-tidal tributary of the Potomac. It begins near the Pennsylvania border and flows about 60 miles south through Frederick County to the Potomac. Davis and Griffith Falls (located, respectively, at the later sites for Michaels and Greenfield Mills) were the major obstacles to navigation in the 17 miles between the city of Frederick and the Potomac.

In May 16, 1765, the *Maryland Gazette* reported: "a Batteau, loaded with Iron, was navigated from the Hampton Furnace on Pipe Creek, to the Mouth of the Manockasy (sic) in Frederick County." This might have been the first major commercial shipment down the Monocacy River. However, where the batteau was destined, and how it maneuvered through the Monocacy's rapids, remain mysteries today.³³

Navigation on the Monocacy River was apparently very limited in the eighteenth century, with efforts directed more toward planning rather than actually clearing the river. *An Act to Prevent Any Obstruction of the Navigation in the River Potowmack* passed the Maryland General Assembly of 1768 and prohibited "fish dams" and other structures that hindered navigation on the non-tidal Potomac and on the Monocacy below Double Pipe Creek. In 1790, Captain Campbell and John Kerr experimented with dams (probably small weirs) to enable the shipment of flour from their Ceresville mill to Frederick, a downriver trip of only a few miles. However, this limited navigational improvement effort "proved impractical." In 1798, a local newspaper speculated that the Monocacy "may be made navigable for a

course of forty miles for flat bottomed boats, which must be equally advantageous to a country abounding in grain, etc, when the Potomac becomes completed and the government removes to the city of Washington.”³⁴

In 1802, the year the Great Falls locks first operated, the Potomac Company arranged for the loan needed to begin navigational improvement of the Monocacy. The directors announced at their August 1802 annual stockholders meeting:

It having been represented to the Stockholders of the Potomack Company by the Landholders on the River Monocasy (sic) in the State of Maryland, that they are willing to advance a sum of money sufficient to remove the obstructions to the Navigation of that River at an interest of 6 per cent from the time of making the advance till refunded, and to wait reimbursement until convenient for the Company, withholding, until such reimbursement be made, all the Tolls upon the articles transported from that River by the Potomack to tide water. Resolved that the Board of Directors be empowered to engage and proceed to the removal of the obstructions to Navigation of that water canal upon the terms proposed, as enabled so to do by the advance of money for that purpose.³⁵

The company gave Leonard Harbaugh, who had just supervised the completion of the Great Falls works, the assignment of surveying, planning and leading the Monocacy effort. In August 1803, a Frederick newspaper advertised for laborers to meet with Harbaugh “who proposes to commence his operations on the improvement of the navigation on the river Monococy, at Griffith’s falls” on August 17, 1803. The plan was for a crew to work its way upstream clearing obstructions, beginning at the lower falls. The initial \$1,500 loan was not finalized until at least September 1803, which slightly delayed the start of the project.³⁶

The Monocacy clearing effort met with some immediate success, as reported in the March 16, 1804 *Bartgis’s Republican Gazette*. “We understand that on Monday, the 12th instant, a new boat belonging to Captain Campbell of this county started from the late General Williams’s mill on the Monocasy about four miles from Town [the Ceresville Mill, and actually on Israel Creek near its mouth] loaded with 80 barrels of flour for the Georgetown market. This, we believe is the first boat built for the purpose of trading down the Monocasy and Potomack rivers to Georgetown.” The March 23, 1803 *Gazette* reported that “Capt. Campbell’s flour boat . . . made a prosperous voyage down” to Georgetown “and returned home in safety on the morning of Monday the 19th instant.”

Despite this newsworthy voyage, the spending of the loan that had grown to just under \$2,800, and a few declarations in 1804 that the Monocacy work was done, more work was needed. In September and October 1804, Leonard Harbaugh’s crews were still working on Davis Falls and clearing fish weirs as far upstream as Double Pipe creek. In August 1805, the Potomac Company authorized a loan “not exceeding 500 dollars for the further improvement of the River Monocasy.” And in 1807, the Maryland legislature passed a new law again declaring fish weirs a nuisance to navigation and outlawing them on the Monocacy below Double Pipe Creek.³⁷

With the Monocacy effort nearly done, the Potomac Company directors reassigned Leonard Harbaugh to the Shenandoah River project in January 1805. Harbaugh returned to the Monocacy River in 1808 and 1809 to supervise the construction of Jug Bridge on Frederick County’s extension of the National Road.

Potomac Company records do not give details of what comprised “clearing” along the Monocacy. Consequently, we do not know if sluices were constructed through Davis and Griffith Falls, or if ledges and rocks were simply blasted away to form a smoother passage through the rapids. In the 1808 and 1817 reports summarizing the status of its works, the Potomac Company simply stated that the “extent of navigation” on the Monocacy was “forty miles.” Because these reports did not mention canals and locks on the Monocacy, but did so in detail for the Shenandoah and Potomac, we can assume that canals and locks were not constructed on the Monocacy, or at least not until dams for merchant mills were constructed across the river.³⁸

The merchant mill and dam across the Monocacy at Davis Falls were built sometime between 1812 and 1816. Potomac Company records noted that Ignatius Davis made navigational improvements at his mill, and for this he could forego “tolls on flour” from his mill. Isaac McPherson began the erection of his merchant mill and dam at Griffith Falls in 1827, having received permission from the Potomac Company to do so. Unfortunately, the details of navigational structures at both mills are not known today.³⁹

After the Maryland legislature approved the building of the C&O Canal, it also considered the possibility of a “Maryland Canal” connecting Baltimore to the C&O Canal. Two proposed routes would parallel the Monocacy River upstream from the C&O Canal aqueduct, continue along either Linganore or Little Pipe Creek and their upper tributaries, tunnel through Parrs Ridge, and proceed down the Patapsco River watershed to Baltimore. Isaac Briggs’ 1823 canal survey, sponsored by the state of Maryland, proposed building a 13-foot dam at Griffith Falls to raise waters there to the level of the C&O Canal. The City of Baltimore commissioned similar surveys by Isaac Trimble, Charles Fisk, and John James Abert in 1837 and 1838. The latter surveys concluded that water supplies on the upper parts of Linganore and Little Pipe Creeks were insufficient to make canal routes there practical.⁴⁰



Ruins of Michaels (Davis) Mill dam on Monocacy River—flow is towards the right. (D. Guzy)

Frederick County citizens pushed for their own still-water canal along the Monocacy, independently of the plans for a cross-Maryland canal. There must have been a general dissatisfaction with navigation on the Monocacy and also an understanding that no further in-river improvements or maintenance would be made after the Potomac Company ceased operations in 1828. A proposed Frederick County Canal would go “so far toward the heart of the county as to place, beyond doubt, its designation to the boundary of the state, and probably to the Susquehanna itself.” There were attempts to persuade representatives from Adams and York Counties to initiate a Pennsylvania canal connecting the Monocacy to the Susquehanna River, presumably along Codorus Creek.⁴¹

However, when Erastus Hurd (in 1828) and John Martineau (in 1829) surveyed for the Frederick County Canal, both of their proposed canal routes ended at a feeder dam across the Monocacy below the Creagerstown Road. Thus the canal would be only 24 miles long, with an upper terminus far from the Pennsylvania border. Disagreements between the C&O Canal Company and Frederick citizens over how

the Frederick County Canal would be funded, coupled with the arrival of the B&O Railroad near Frederick in 1831, ended the project.⁴²

In 1833, the same year the C&O Canal's Monocacy aqueduct was completed, the 1807 act outlawing Monocacy fish dams was modified to restrict such obstructions to only the ten-mile stretch below "Kemp's, lately Davis's, mill dam" (i.e., Michaels Mill). This change implies that while river navigation from that mill to the Potomac was still wanted, river commerce from the city of Frederick, seven miles upstream, was no longer needed or practical.⁴³

Unfortunately the Potomac Company records do not detail the locations of its Monocacy River structures, except at the two falls. Interestingly, John Martineau's 1829 survey maps show what appear to be twelve stone weirs in the Monocacy—eleven V-shaped and one single-winged. These might have been navigational weirs built by the Potomac Company, or perhaps just illegal fish weirs.

Goose Creek

Goose Creek flows through Loudoun County, Va. and enters the Potomac River at the site of Edwards Ferry. It was near the mouth of Goose Creek that the joint commissioners abandoned their Potomac survey in 1822 due to "bilious fever" and went to convalesce at William T. T. Mason's home, Temple Hall, outside of Leesburg, Va.

The Goose Creek and Little River Navigation Company was chartered in 1832, after the Potomac Company had been dissolved. Its goal was to make Goose Creek navigable for 20 miles, its north fork navigable one mile to Coes Mill, and the Little River navigable five miles to the mill at Aldie. The Snickers Gap and Ashbys Gap turnpikes met at Aldie, so this canal terminus would serve to connect with western commerce routes. The C&O Canal's two river locks opposite the mouth of Goose Creek would be the terminus at the other end. The C&O Canal Company (whose president, Charles F. Mercer, owned the Aldie mill) also helped in the Goose Creek effort by assisting in the survey of Goose Creek and Little River in 1832.⁴⁴

Although the C&O Canal and its river locks were available in the 1830s, construction on the Goose Creek works did not begin until 1849. As with the Potomac Company's Antietam Creek effort, the Goose Creek and Little River Navigation Company's approach was to take advantage of slack water behind existing milldams, and build canals and locks around the dams. Dams were raised to increase the length of slack water behind them. The locks were made of stone, with chambers measuring 52 by 11½ feet. This lock size was smaller than those for the C&O Canal, and meant to accommodate smaller boats that could be poled upstream.

By 1854, nine locks and dams were constructed. The furthest upstream were at Balls (now Evergreen) Mill, where the current Route 621 crosses the creek. The works furthest downstream were the mile-long canal and two staircase locks at Elizabeth Mills, near Goose Creek's mouth.

Only one boat ever navigated these works. A 42-foot boat built in Cumberland was hauled up Goose Creek to satisfy the construction contract. The boat had to be pulled over sandbars by oxen and slaves, but made it as far as Balls Mill. The Goose Creek and Little River Navigation Company was dissolved in 1857, with its last annual report blaming the "languishing condition" of the canal and competition from railroads drawing off investors.

Remains of this canal system can still be observed today. The Elizabeth Mills canal and locks are on land that once was part of the Xerox Corporation's training center, but is now publicly accessible as part of Loudoun County's Elizabeth Mills Riverfront Park. These locks are only a short paddle across the Potomac and up Goose Creek from the Edwards Ferry boat ramp and parking area on the C&O Canal, downstream from which the C&O Canal's river locks on the Maryland shore can also be visited.⁴⁵



Remains of staircase locks at Elizabeth Mills off Goose Creek. (D. Guzy)

¹ In a December 5, 1791, letter to Arthur Young, George Washington proposed improving navigation on the Shenandoah River and the Potomac's South Branch. He also stated, "the Monocacy and Conococheague are capable of improvement to a degree which will be convenient and beneficial to the Inhabitants of that State, and to parts of Pennsylvania" (George Washington papers).

² January 20, 1808, Potomac Company response to inquiries by the secretary of the U.S. treasury, Albert Gallatin (Potomac Company records).

³ December 9, 1817, letter from John Mason to Bernard Peyton, secretary of the Va. BPW.

⁴ *Eighth Annual Report of the President and Directors of the Board of Public Works to the General Assembly of Virginia*, Richmond, 1824, page 132. Frankfort was at the current location of Fort Ashby, W.Va.

⁵ Arthur G. Burton and Richard W. Stephenson, "John Ballendine's Eighteenth-Century Map of Virginia" in the July 1964 issue of the *Quarterly Journal of the Library of Congress*. The Library of Congress's *American Memory* website has an online version of Ballendine's 1773 map at <http://hdl.loc.gov/loc/gmd/g3880.ct000399>

⁶ Diary entry for September 28, 1784, and letters to Robert Morris, February 1, 1785, and to Arthur Young, December 5, 1791 (George Washington papers). Fort Pleasant, also known as Henry Van Meter's Fort, was a French and Indian War fort built near Old Fields, W.Va., and was downstream of Moorefield.

⁷ Minutes of June 22, 1822, meeting (Potomac Company records).

⁸ Hu Maxwell and R.L. Swisher, *History of Hampshire County, West Virginia*, Morgantown, 1897, pages 534-536. James Morton Callahan, *History of West Virginia Old and New*, Chicago and New York, 1923, page 135.

⁹ *Eighth Annual Report of the President and Directors of the Board of Public Works to the General Assembly of Virginia*, Richmond, 1824, pages 119-128.

¹⁰ The 1835 map, "Survey of the South Branch of the Potomac River," is online on the Library of Virginia website <http://www.lva.virginia.gov/index.htm> by searching for Board of Public Works, or at <http://bit.ly/kf425g>

¹¹ Hu Maxwell and R.L. Swisher, pages 534 -536. James Morton Callahan, page 135.

¹² *Eighth Annual Report of the President and Directors of the Board of Public Works to the General Assembly of Virginia*, Richmond, 1824, pages 129-131.

¹³ I. H. McCauley, *Historical Sketch of Franklin County, Pennsylvania*, Chambersburg, Pa., 1878 (reprinted 1979), page 134. J. Fraise Richard, *History of Franklin County Pennsylvania*, 1887 (reprinted 1975), pages 561-562, stated that David Kennedy, the son of the original settler of the land at the confluence of Conococheague's East and West Branches, was a boatman who traveled from this confluence to Georgetown and Alexandria, presumably via the Potomac Company's works.

¹⁴ Dan Guzy, "Bateaux, Mills, and Fish Dams: Opening Navigation on the Monocacy River and the Conococheague and Antietam Creeks," *Maryland Historical Magazine*, Volume 93, No. 3 (Fall 2003), pages 284-286.

¹⁵ The act was approved and signed by the governor on February 7, 1803 (Gertrude MacKinney, editor, *Pennsylvania Archives*, Ninth Series, Volume III, 1931, page 1900).

¹⁶ Potomac Company records. The January 20, 1808, response of the Potomac Company to inquiries by the secretary of the U.S. treasury stated inconsistently that Conococheague was navigable first for "14 miles" and then for "24 miles." It also stated that

work on the creek had only been done “near its mouth.” Except for the minutes of a September 12, 1810, meeting authorizing the contracting of work to clear the Conococheague, work on the creek after the Swingleys Mill chute was finished seems never to be mentioned in Potomac Company accounts.

¹⁷ George Armroyd, *A Connected View of the Whole Internal Navigation of the United States*, Philadelphia, 1830, pages 205–206. Conodoguinet Creek Watershed Association and Timothy A. Lemke, *A Long Way with Many Bends*, published before 1993.

¹⁸ Potomac Company records and Bacon-Foster, page 111. Susan Winter Frye, *Evolution of Mill Settlement Patterns in the Antietam Drainage, Washington County, Maryland* (1984 M.A. thesis in the Western Maryland Room of the Washington County Free Library) discusses the evolution of small local “custom mills” in the Antietam Valley to larger merchant mills designed to produce flour for export.

¹⁹ Act passed January 7, 1812 (1811 Session, Chapter 208).

²⁰ Potomac Company records. The advertisement regarding Antietam loan payments was in the *Maryland Herald and Hagerstown Weekly Advertiser* on April 8, April 15 and April 29, 1812, and in the *Hagers-Town Gazette* on April 7, 1812. “Josias Thomson” was how the man signed public advertisements; however, some Potomac Company records referred to him as “Josiah” and “Thompson.”

²¹ Potomac Company records.

²² Potomac Company records.

²³ Potomac Company records and *A Journal of Accounts and etc., Thomas Harbaugh with the Potomac Company and other from 1803 to 1833* (written circa 1833, copies at the Western Maryland Room of the Washington County Free Library). Thomas Harbaugh’s *Journal* presented detailed accounts of his projects, including the Antietam effort. On page 77 of his *Journal*, Harbaugh referred the reader to material he sent to John Mason, Potomac Company president, in 1818 that gave detailed descriptions of “the Locks and the Creek.” This apparently is the 15-page *Memorandum of the Antietam Creek* now in Potomac Company records, signed by Thomas Harbaugh, but undated.

²⁴ Potomac Company records. The notice was placed in the *Maryland Herald and Hagerstown Weekly Advertiser* on May 10, May 31, and June 14, 1815. The Potomac Company directors also planned to place similar notices in the *Federal Republican* and a newspaper “in Lancaster.”

²⁵ Thomas Harbaugh’s *Journal and Memoranda*.

²⁶ John W. Stonebraker bought Shafer’s mills and factories in 1859 and briefly turned them into a paper mill. Afterwards, he made large additions to Shafer’s old mill and established the Antietam Flour Milling Company (David E. Wiles, *Antietam Paper Company—Spanning the Years*, published by Antietam Paper Company, Inc., 1982). His son, Joseph R. Stonebraker, wrote (probably inaccurately) of the canal in his memoirs, *A Rebel of ’61* (Wynkoop Hallenbeck Crawford Co., New York and Albany, 1899, pages 19–20): “In 1812, the company built two locks, and connected the two dams by digging a canal some eight hundred feet long. The boat which was about one hundred feet long, gondola shape, sharp at both ends, without a deck, was loaded with one hundred and twenty-five barrels of flour, passed safely through the canal and lock, but was wrecked while passing into the lower dam, and the cargo became a complete loss. This accident so discouraged the company that the project was abandoned and Schafer afterwards utilized the canal by building a saw and cement mill over the locks.” This story was repeated in an article on Johnstons Island (Funkstown) in the August 4, 1970, *Morning Herald*.

²⁷ Diary entry for October 4, 1784 (George Washington papers).

²⁸ For much more detail about Shenandoah River navigation, see W.E. Trout, *The Shenandoah River Atlas*, Virginia Canals & Navigations Society, 1997.

²⁹ January 20, 1808, response of the Potomac Company to inquiries by the secretary of the U.S. treasury (Potomac Company records).

³⁰ Potomac Company records. W.E. Trout, *The Shenandoah River Atlas*, pages 93 and 97. Trout suggested that, despite the windlasses and ropes, return travel upstream on the Shenandoah was rare because most cargo shipments were one-way downstream in disposable “gundalows” (flatboats).

³¹ John Wayland, *History of Rockingham County Virginia*, Dayton Va., 1912, page 418

³² Advertisement in the January 16, 1841 *Rockingham Register*, cited in Wayland, pages 418–419

³³ The *Maryland Gazette*’s reference to “Hampton Furnace on Pipe Creek” is another mystery. Hampton Furnace was on Toms Creek near Emmitsburg (Basil Crapster, “Hampton Furnace in Colonial Frederick,” *Maryland Historical Magazine*, Vol. 80, No.1, Spring 1985). William Trout in “Evidence of Bateau Navigation on Monocacy River” (*Quarterly*, Frederick County Landmarks Foundation, July–September, 1986) speculated that because Toms Creek is not navigable today, and because the Hampton Furnace’s ironmaster was Normand Bruce of Bruceville on Big Pipe Creek, perhaps the *Maryland Gazette* confused Hampton Furnace with one at Bruceville. However, this current author could find no mention of a Bruceville furnace in Carroll County historical resources.

³⁴ Campell’s and Kerr’s navigational effort is discussed in “Ancient Mills of the Monocacy,” in the April 11, 1926, *Baltimore Sun*. The *Sun* article speculated that what many consider to be the stone ruins of fish weirs in the Monocacy might instead be ruins of navigational weirs. The 1798 quote was from *The Key*, as reproduced in T. J. C. Williams, *History of Frederick County, Maryland* (1910 edition reprinted in 1979 by the Regional Publishing Company, Baltimore, page 269). The “forty miles” of potentially navigable water noted in the *Key* article is the stretch of the Monocacy below Double Pipe Creek, near Detour, Md. This is the extent of potentially navigable Monocacy waters considered in 1768 fish dam act, as well as several Potomac Company accounts.

³⁵ Report of August 1820 annual report (Potomac Company records).

³⁶ Minutes for meetings of August 27, 1802, September 13, 1803, and September 17, 1803 (Potomac Company records). The advertisements for laborers appeared in the August 12 and 19, 1803, *Bartigis's Republican Gazette*.

³⁷ The *National Intelligencer* noted the completion of the Monocacy works in 1804 ("Observations of the Intended Canal in Washington City—City of Washington—1804," reproduced in *Records of the Columbia Historical Society, Washington D.C.*, Vol. 8, 1905, pages 159–166). Similarly, the Potomac Company directors stated at their August 1804 annual meeting that the Monocacy "has been rendered very safe and practicable for the distance of about forty miles" (Potomac Company records). The Maryland legislature passed the Monocacy fish dam act on January 4, 1807 (1806 Session, Chapter 79).

³⁸ January 20, 1808, response of the Potomac Company to inquiries of the Potomac Company by the secretary of the U.S. treasury and December 9, 1817, letter from John Mason to Bernard Peyton, secretary of the Va. BPW (Potomac Company records).

³⁹ The August 29, 1812, *Frederick-Town Herald* mentioned that the merchant mill at Davis Falls was then "now building" in a public notice for a proposed road from Jefferson to New Market, Md. Minutes from February 1816 and July 1819 Potomac Company meetings note Ignatius Davis's navigational improvements (Potomac Company records). McPherson's mill at Griffith Falls would later be known as "Greenfield Mills." This mill and dam are now gone, but traces of the millrace and iron rods to secure the dam to bedrock can still be found.

⁴⁰ The reports of Briggs, Trimble, Fisk, and Abert are in the Maryland Historical Society library. For more background on proposed independent canals along the Monocacy River, see Dan Guzy, "Down the Monocacy—River Navigation and Canal Surveys in Frederick County, Maryland" (*Catoctin History*, Issue #5, Spring/Summer 2005, pages 33–41).

⁴¹ August 16, 1828, *Frederick-Town Herald*. Letters from Abraham Shriver to Jacob Shriver dated January 3, 1829, January 13, 1829, January 18, 1829, and February 5, 1829 (Shriver Family Papers, Maryland Historical Society library).

⁴² John Martineau's handwritten report, maps and canal profiles for a Frederick County Canal are located today in Frederick's City Hall. These also note Hurd's survey. A May 18, 1853, article in the *Frederick Examiner* expressed regret over the Frederick County Canal's demise and printed Martineau's February 1830 report in its entirety.

⁴³ The 1833 Monocacy fish dam act is in the *Archives of Maryland Online*, Volume 141, pages 1922–1924. The act remained unchanged in 1860, 1888, and 1930 publications of the *Maryland Code of Public Local Laws*.

⁴⁴ W.E. Trout, *The Goose Creek Scenic River Atlas*, Virginia Canals and Navigations Society, 1994, and Eugene Scheel, "On Goose Creek, High Hopes Foundered on Sandbars," *Washington Post*, May 21, 2006.

⁴⁵ See W.E. Trout, *The Goose Creek Scenic River Atlas* for information on the ruins of canal structures. The Elizabeth Mills staircase locks are also next to the 13th green of the Greg Norman Course at the golf club at the Lansdowne Resort.

Between the Shenandoah River and Tidewater

While passing through Bath (Berkeley Springs, W.Va.) on his 1784 trip, George Washington was impressed by James Rumsey's demonstration of a model boat that magically moved upstream against the current, the mechanical pole boat Rumsey called his "streamboat." Unable to find a person with good canal-building experience, Washington endorsed the inventive Rumsey to become the first principal superintendent of the Potomac Company. Beginning in July 1785, Rumsey directed the initial engineering of the Potomac Company's navigational works from Shenandoah Falls to tidewater. By September 1785, James Rumsey had proposed a new "mechanical discovery" that would use "chains floated by buoys" to pull boats up the Potomac River and somehow avoid the construction costs of elaborate canals. Unfortunately, Rumsey quit the Potomac Company in July 1786 over a dispute and never implemented his "mechanical discovery."¹

Lacking a more-inventive and easier way, river improvements in the 57-mile stretch between the Shenandoah River and tidewater came only after arduous and lengthy efforts to clear obstacles and build sluices, canals and locks. The navigational works were not fully completed until the opening of the Great Falls locks in 1802 and required continual maintenance afterwards.

In this stretch of the upper Potomac through the piedmont plateau and fall line, the Potomac Company build three of its four major navigational works—its canals with locks at Great and Little Falls and the sluice without locks at Seneca Falls. The company also continually worked on other smaller rapids, beginning as early as 1785 when it ordered the clearing of obstructions from Paynes Falls through Shenandoah Falls. Clearing of minor rapids in this stretch continued until the time the Potomac Company went out of business in 1828.²

Despite these efforts, even this most-watered part of the upper Potomac River presented navigational problems in dry seasons. The joint commissioners' report only covered the river as far downstream as Goose Creek, but cited navigational problems from the long canal above Harpers Ferry to Lucketts Ferry and through Hooks Falls.

The following discusses navigational features on the Potomac River below the mouth of the Shenandoah River.

The Spout

The Potomac River rapids just below the mouth of the Shenandoah River are today called "Mad Dog" (Class II) and "White Horse" (Class III). Thomas Moore, in his 1820 report, seemed to collectively call the two rapids the "Bull Ring Falls" and estimated their fall as six feet—twice that of House Falls upstream.

The White Horse Rapids, located a half mile below Harpers Ferry, are apparently what George Washington called "the Spout," and what nearly sank his canoe during his 1754 Potomac canoe trip. John Semple called the Spout the most dangerous rapid above Great Falls. Washington again noted the "rapidity of the Water and its dashings" there during his 1785 inspection.³

The joint commissioners' report said the Spout was "extremely rapid and rocky for a distance of three hundred yards, or more, making a very crooked passage among dangerous rocks, and must be a most hazardous navigation at any time, and cannot be improved, but at an expense which would make a good independent canal for the same distance." In 1826, Solomon Buchles reported bad navigation conditions at "the Bull Ring" due to gravel sediment buildup.⁴

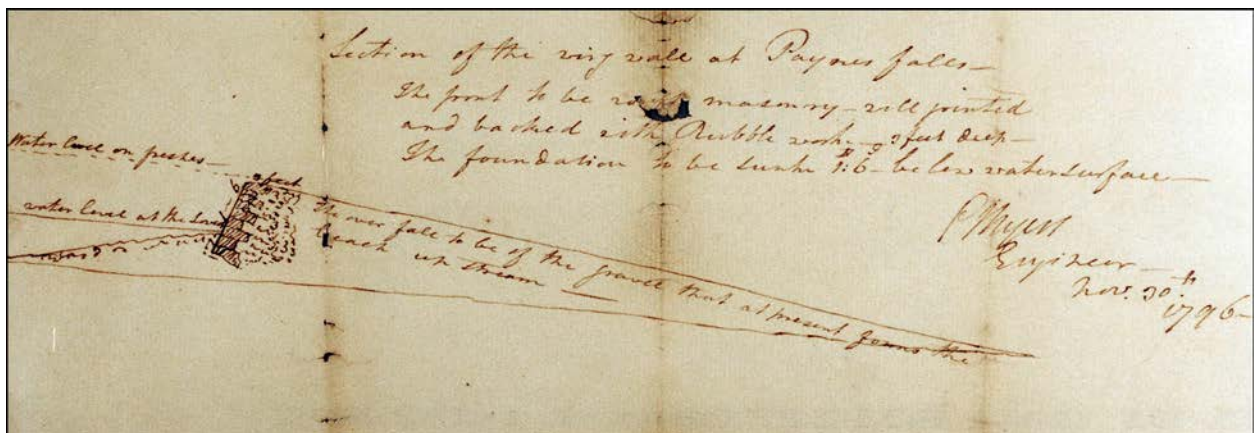
The Potomac Company records and independent surveys never specifically noted dams, walls, or sluices at the Spout. Thus, despite its notoriety, we must assume that the company's work at the Spout was limited to removing rocks and sediment, and not to erecting navigational structures.



The Spout—flow is towards the left. (D. Guzy)

Paynes Falls

Paynes Falls are between Weverton and Knoxville, Md., downstream from the end of the Short Hills on the Virginia side. John Semple described these falls as a “Rift of Rocks, extending across the River which may be passed through a naturall channel in land that may be improv’d so as to admit the passage of Vessells.” The 1785 inspection by George Washington and the Potomac Company directors recommended improving the channel along the Maryland shore. In 1791, a work crew at Paynes Falls “cleared out the fall there, and made a Dam of Considerable length in order to turn the water thro. the Cut and lined the cut on the maryl’d side, with stone and wood the whole length of the cut.” Company records cited further work done at Paynes Falls a half dozen times between 1795 and 1828.⁵



Sketch of “wing wall” at Paynes Falls. (Courtesy of National Archives)

The joint commissioners’ 1822 report noted that at “Devil’s Elbow, at Payne’s Falls, opposite Payne’s island, between which and the Md. Shore, is wall work made by the Potowmac Company, as a canal

[channel] for boats.” In 1826, Solomon Buchles reported that “the Devil’s Elbow requires removal of gravel at the lower end & the wall repairing at Paynes falls.”⁶

Today, no trace remains of the Potomac Company’s works at Paynes Falls. The C&O Canal is too far from the shore for its construction to have destroyed previous works. So we must assume that floods and age are to blame for removing whatever navigational structures the Potomac Company built at Paynes Falls.



Paynes Falls—looking upstream from Maryland shore. (D. Guzy)

Lucketts and Hooks Falls

Lucketts Falls were presumably the ledges just upstream from the mouth of Maryland’s Catoctin Creek and near the old Lucketts Ferry. The rapids downstream between Maryland’s and Virginia’s two Catoctin Creeks were known as Hooks Falls. In August 1791, a crew worked on clearing Hooks Falls “from one End of the Falls to the other, blowing and moving of rocks and Every obstruction that could be done.” Afterwards, the crew moved upstream to work on Lucketts Falls.⁷

Early maps show that, like today, islands in the middle of the Potomac divided the Potomac into two channels at Hooks Falls. The Potomac Company’s annual report of 1792 noted that: “The Navigation at Hooks Falls was rendered perfectly safe by making the Passage straight along the Virginia shore.” Presumably these improvements restricted boat traffic to that shore, making it a logical location to collect tolls. As with its navigational works at Paynes Falls, Potomac Company records cited several efforts to improve the works at Hooks Falls over the years.⁸



A section of Hooks Falls—flow is towards the left. (D. Guzy)

Seneca Falls

The Seneca Falls or “Breaks” are at the Fairfax and Loudoun County (Virginia) border, about a mile below Seneca Creek on the Maryland side. After canoeing these 1½-mile, Class II rapids in August 1754, George Washington concluded that “the Seneca Fall is easily pass'd in two places” going downstream, but was difficult to navigate upstream. Recognizing also the much greater obstacles at Great Falls eight miles below, Washington advised that Potomac River navigation to Wills Creek (at Cumberland) start at “the Landing place at the Sugarland [Lowes] Island,” near the head of the Seneca Falls.⁹

Similarly, Thomas Johnson’s 1770 Potomac navigation proposal recommended avoiding the Seneca, Great and Little Falls rapids by a land carriage of “12 or 14 miles” between Seneca and tidewater. However, the more ambitious schemes of John Semple and John Ballendine sought to improve navigation through the Seneca Falls.

Semple recommended modifying a millrace and a dam along the Virginia shore already built by Ballendine, and adding “only two Short Dams with Gates placed in them, four or five feet in height in a narrow natural channel between a chain of Islands and the Main.” Semple’s suggestion of single gates through the three dams implies the use of simple flash locks at the three dams, and not the double-gated pound locks commonly used by later canals.¹⁰

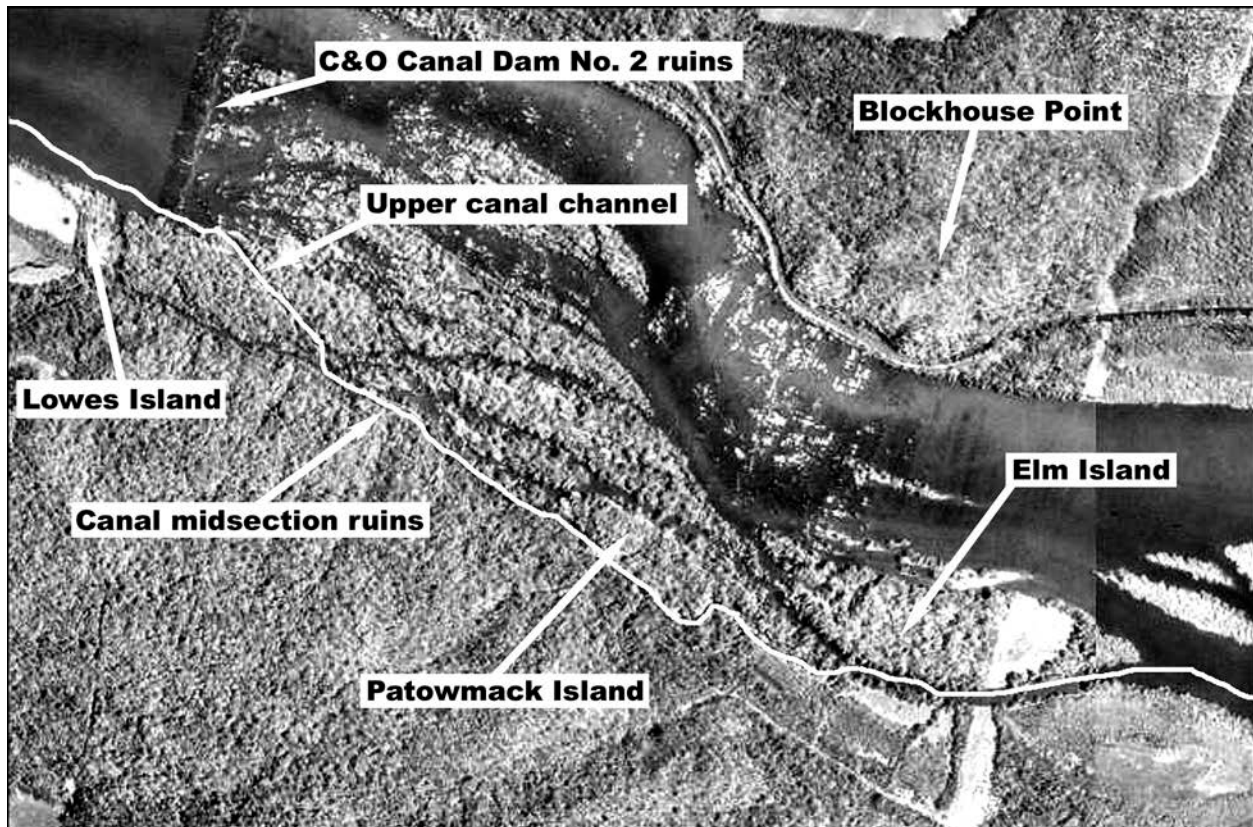
Ballendine’s plan called for a single, 10-foot-high lock at Seneca. His plan stated that because the fall at Seneca was “too rapid for a river navigation, a level cut must be made on the Virginia side, from the Mill Branch to the Iron Landing at the head of the falls, one mile and an half in length, thirty feet wide, and four feet deep.”¹¹

It seems that neither Semple nor Ballendine made any real navigational improvements at the Seneca Falls. However, George Washington and the Potomac Company directors were well aware of their proposals when they inspected Seneca Falls in August 1785. They specifically dismissed “the choice of

Mr. Ballendine for a Canal with Locks.” The Potomac Company began construction of a canal without locks (i.e., a sluice) along the Virginia shore at Seneca that same month, and by September 1785 there were 50 men working when Washington revisited the site and observed their “blowing rock” in the channel.¹²

Washington and the directors frequently went to Seneca to inspect progress of the works. In 1787, Washington described the sluice then still under construction. “At the Seneca falls six miles above the great fall a channel which has been formed by the river in freshes [freshets] is under improvement for the navigation.” That is, work crews deepened and walled a high-water channel through land along the Virginia shore. The sluice artificially created Patowmack Island, making it one of only very few Potomac River islands within Virginia’s border.¹³

Labor problems, heavy rains, and high water levels slowed progress on the Seneca and Shenandoah Falls sluices. However, by January 1790 the Seneca works were completed.¹⁴



Route of Seneca Falls sluice—modified by D. Guzy from USGS aerial photograph

Potomac Company records show that the Seneca works underwent continuing maintenance and improvement like all the other Potomac Company works. Around 1814, a wing dam was constructed (or reconstructed) at the head of the Seneca sluice to feed water into it. In 1820, when Thomas Moore surveyed the river, he noted that water levels in the Seneca sluice were so low that boatman instead went down through the falls. “The dam at Seneca requires repairing so as to turn more water into the canal, at present there is not enough to float our little skiff, we were under the necessity of going down through the falls. Boatmen who are acquainted with the outer course may pass down with safety, but it is very hard to ascend. There certainly ought to be at least as much water in the canal at all times as would float an ascending boat with a small load.”¹⁵

In 1830, the C&O Canal Company completed its Dam No. 2 across the Potomac at the head of Seneca Falls. This dam supplied water into the new canal along the Maryland shore through an inlet lock

next to Violettes Lock (Lock No. 23). The new dam and inlet lock made the Potomac Company's Seneca sluice obsolete.

Potomac Company reports noted that a seven-foot difference in level at the Seneca rapids was overcome by a canal without locks (a sluice), said (generically) to be "16 to 20 feet wide, and from 4 to 5 feet deep." Curiously, the reports consistently stated the canal had a distance of "thirteen hundred and twenty yards." That is only three quarters of a mile—only half the distance of the Seneca Breaks. Perhaps the stated distance applied only to the cut that created Patowmack Island, which USGS topographical maps show to be about three quarters of a mile long.¹⁶

Today, well-defined ruins of the Seneca sluice can still be seen. Remnants of the walls for the upstream entrance to the sluice can be found in an upper channel that starts near the Virginia end of Dam No. 2, about 50 feet from Lowes Island. This channel can only be reached by water and is downriver from the channel next to Lowes Island that paddlers normally take in a circuit route they call "George Washington's Canal." The circuit route starts at Violettes Lock, crosses the Potomac above the dam, moves through Virginia shore channels, re-crosses the Potomac to Blockhouse Point, and moves up the watered stretch of the C&O Canal, back to Violettes Lock.¹⁷

Roughly halfway along the Seneca Breaks, starting about 50 yards downstream from a steep bluff along the Virginia shore, two stone walls form a 15- to 18-foot wide channel for what probably was the upstream entrance to the sluice midsection cut along Patowmack Island. The upper portion of the wall along the shore is constructed of large stone slabs, some in an upright position "like rows of leaning books." You can visit these sluice midsection ruins by parking at the gated entrance to the Northern Virginia Regional Park at the end of Seneca Road, and then hiking along a gravel service road built for the Potomac Interceptor Sewer. After heading right and downhill towards the Potomac, you should continue straight to sluice ruins on the river rather than following the service road where it bends to follow the floodplain.

Downstream of these sluice midsection ruins, the rest of the channel along Patowmack Island now has little evidence of being a sluice. The channel is breached in some places and un-navigable in most. Its higher banks are irregular and consist mainly of clay. However, during low water conditions when parts of the channel are dry, rows of stones resembling collapsed walls can be seen in some sections of the channel.

Although the Seneca sluice ruins are today in public parkland, there has been no attempt to stabilize them. The entrance to the midsection channel was clogged with trees and debris when this author last visited. No interpretive sign marks where once passed batteaux loaded with flour, whiskey, iron, and building stone. The Potomac Company's Seneca sluice is left to decay and be forgotten.

Seneca to Great Falls

The river distance from the bottom of the Seneca canal to the wing dam at the entrance to the Great Falls canal is roughly 5 miles. Watkins Island divides the Potomac into two channels for much of this distance, and it is logical that the Potomac Company removed obstacles only in the Virginia-side channel.

In 1787, the Potomac Company cleared river obstacles and constructed "a good Towpath" along the Virginia shore in this stretch. The company's annual report of 1792 noted that "the Passage between the Sinica [sic] & Great Falls has been made Safe and easy by making it Straight in many places, removing Rocks, throwing up Dams to Collect & Deepen the Water wherever it was necessary." Other accounts noted the clearing of this stretch in 1802 and 1803.¹⁸

In his 1820 survey report, Thomas Moore gave the improvements in this stretch a somewhat favorable review. "Between Seneca and Great Falls there has been some work done to improve the bed of the river, generally to pretty good effect, but for want of timely attention some of these works are gone out of repair, and do not answer the purpose intended."

The Potomac Company's annual report of 1826 said: "The sluices and dams between the Great Falls and Seneca canal were repaired and rebuilt . . ." Unfortunately, the company records do not detail the location and construction of these navigational structures.¹⁹

One modern author noted that "low wing dams and walls in the main river . . . can be made out during low water" in this stretch. However, it is uncertain whether these are the ruins of fish weirs or navigational structures. Given that a towpath was along the Virginia shore, any weir ruins far away from that shore likely were not for navigational purposes.²⁰

Great Falls

The Great Falls with their 76¾-foot fall were by far the greatest obstacles to navigation on the upper Potomac River. The 1762 Potomac navigation scheme left it up to "some Skillful Gentlemen" to determine whether "opening or passing" them was "practicable." John Semple's and Thomas Johnson's navigational plans avoided both Great and Little Falls by proposing portages to tidewater start upstream of Great Falls. However, the intrepid John Ballendine intended to build a bypass canal around the falls. The Potomac Company also boldly took on the challenge of Great Falls. It began work on the Great Falls canal and locks in 1785 and finally completed them seventeen years later.



Great Falls Locks 4 and 5 were set in the cut through the rock palisades—river flow is towards the left. (D. Guzy)

When George Washington inspected the Great Falls site on the Virginia side in September 1785, he felt that nature had clearly marked out the route for a bypass canal "along a glade which runs quite from the still water above the spout." However, George Gilpin was still "leveling" possible routes the next month, and apparently Washington and Gilpin did not settle on a line for the canal cut until after return visits the next February and March. By then, the construction huts at Great Falls were erected, enabling Washington and the directors to dine at the site during these and several subsequent meetings at the site.²¹

In December 1787, Washington reported good progress in digging the canal: "At the Great falls the labour has indeed been great; the water there is taken into a canal about 200 yards above the Cataract and

conveyed by a level cut (thro' a solid rock in some places and very Stoney ground in others) more than a mile to the lock seats; [five] in number, by means of which the Craft when these locks are compleated will be let into the River below the fall." In June 1788, Washington noted more work had to be done on the canal above the lock seats, and hoped that this portion would be completed by the end of that summer.²²

George Washington eagerly sought advice from William Weston, the English engineer for the Schuylkill and Susquehanna Canal. In 1795, Weston inspected the Potomac Company's works from Shenandoah Falls to tidewater. When he visited Great Falls, Weston advised that lock seats then under construction be relocated. Although costly and time-consuming, the Potomac Company took his advice.²³

The canal and basin at Great Falls were completed and watered before the locks were ready. The construction of a lifting machine and wooden inclined plan facilitated the transfer of cargo from the upper canal to the lower river. Thus cargo could at last be moved downstream to tidewater and tolls could be charged. The Maryland act allowing toll collection, passed on January 10, 1798, noted: "a warehouse is also provided for storing such articles when found necessary, or when boats are not ready for transporting said produce down the said river."²⁴

The Duke de La Rochefoucault-Liancourt noted the operations at Great Falls canal during this interim period:

To make some use of the canal in its present state, till the locks can be completed, large masses of earth are left to check the rapidity of the water [i.e., block the canal water upstream of the locks]; vessels proceed to the places where these are and the barrels of flour and hogsheads of tobacco which are the principal articles brought down the river are rolled down an inclined plane made of wood (for this temporary use) to vessels that wait for them below.²⁵

In July 1799, the company declared: "At the Great Falls one lock has been formed; four more are requisite; the seat of one of those is nearly excavated. To aid the intercourse till the work is completed at this place, a machine is constructed to pass articles from the waters above, to the waters below, which is found to answer extremely well." The next year the company noted that labor problems had slowed lock construction, and that although 800 cubic yards of solid rock had been excavated for the lower two locks, this was "estimated to be [only] one seventh part of the whole excavation required."²⁶

In December 1801, the company gave the status of the Great Falls works as "a Canal of three quarter of a mile was executed and a large Bason (sic) was made for the safe using of Boats and one lock finished." By the end of February 1802, all five locks were finished.²⁷

The Great Falls works included a canal fed by a wing dam above the falls, an upstream guard gate, spillways and water supplies for a gristmill and forge, a holding basin with a waste weir and guard gate, and five locks at the downstream end of the canal. Locks 1 and 2 were independent and Locks 3, 4, and 5 were combined locks, sharing common gates. A 1797 report mentioned a guard wall built "in the River on the upper side of the Entrance" of the locks, presumably to deflect river flow and help boats enter into (and exit from) the lower part of the canal. Local stone and stone quarried from Seneca were used in the first three locks (Locks 1, 2 and 3), and the lower two locks (Locks 4 and 5) were blasted out of the solid rock palisades along Mather Gorge.²⁸

In 1808, the Potomac Company stated the total distance of its Great Falls canal was 1200 yards. The total lift (or fall) was 76.75 feet, accomplished by individual lifts for Locks 1 through 5 reported respectively as 10, 16, 14, 18, and 18 feet. It said all locks were 100 feet long, Lock 1 was 14 feet wide, and the other four locks were 12 feet wide. See Appendix III for summaries of other descriptions of the Great Falls works.²⁹

The Great Falls works needed maintenance throughout their operation. The canal and locks had to be continually cleared of sediment, so much so that a cleaning machine was built in 1821. The wooden lock gates at Great Falls were replaced between 1818 and 1821.³⁰

Thomas Moore's 1820 survey report noted the need to repair and extend the wing dam at Great Falls, which was done the following year. The company's annual reports between 1821 and 1827 cited

continuing repairs of lock gates and walls. The 1828 annual report noted that “in addition to the repairs and improvements stated in the last annual report to have been made on the different locks, canals and other works in various parts of the river, three of the locks at the Great Falls have of necessity and at considerable expense undergone a thorough repair in the stone work, two of them having been rebuilt from the ground, and a large portion of no. 3 lock been replaced from the foundation. A considerable expenditure was also made in repairs of the gates and other works requiring carpenter’s assistance.”³¹

The building of the lower sections of the C&O Canal along the Maryland shore made the Potomac Company’s Great Falls works obsolete. The Potomac Company’s canal on the Virginia shore was used only until 1830, when the locks there were dismantled.³²

Today, the Potomac Company works are well preserved and interpreted at the Great Falls Park in Virginia. One can start at the upper entrance, where the wing dam is still visible in low water, and walk along the canal route down past the remains of the basin, and into the lock area. The wooden lock gates are gone (except for one set preserved and kept in the visitor center), but the five lock seats still remain in the best condition of any of the Potomac Company works.



Reconstructed walls of the Great Falls canal. (D. Guzy)

Great Falls to Little Falls

The 10-mile stretch between Great and Little Falls is bordered by rock cliffs and filled with rocky islands. Whitewater paddlers today enjoy the several Class II and III rapids there, including those at Difficult Run, Yellow Falls, Calico Rapids, and Stubblefield Falls.

In 1793 and 1794, while the canal and locks at Great and Little Falls were still under construction, the Potomac Company cleared this stretch of river for navigation. After the completion of the Little Fall locks in 1795, this stretch saw some river commerce from the cargo raised and lowered on the inclined plane at Great Falls. Further clearing in the Great to Little Falls stretch was reported in 1802 and 1803. In 1812, there was another effort to clear the river from Little Falls through Stubblefield Falls.³³

In the report of his 1820 survey, Thomas Moore noted that the river improvements in this stretch had to “a considerable degree produced the intended effect, but something still remains to be done in order to give sufficient depth of water in all places, and also to render the falls more easy for ascending boats at all stages of the water.” Moore recommended the use of chains attached to rocks by “ring bolts or pins” to aid in towing boats just below Great Falls.

Today, there are many iron rings and hooks all along this stretch of river. Some of these rings may have been used for ferries or just as boat moorings, but others could have served a navigational purpose. Osgood Smith assumed this when he wrote in 1983:

Navigation from Difficult Run up to the [Great Falls] canal lock entrance was aided by a series of chains and ropes fastened to iron rings, hooks and posts in the cliffs along the Virginia side of the gorge. Seven rings and about a dozen hooks or posts are still intact and the position of others is indicated by broken iron posts. The remnant farthest downstream is just above the bypass chute at Difficult Run Rapids, where it must have been really needed. From there up to the canal entrance they are unevenly scattered, being some 40-50 feet apart where the current is strong and apparently absent in slack water and upstream eddies. There are also some just above the lock entrance. Most of the hooks and rings are on the downstream side of projections; hence they can best be seen while paddling upstream.³⁴

With the exception of Stubblefield Falls, the Potomac Company records did not cite the specific location of navigation structures it made between Great and Little Falls. Thomas Moore mentioned navigational works at both Stubblefield Falls and a location he called Crooked Gap:³⁵

At Stubblefield Falls the pass is safe for descending boats except that the rapidity of the current over the uneven bottom produces a roughness that causes them when fully laden to ship water, but the angle of ascent is so great and situated in the middle of the river where no advantage can be derived from towing that it is vain to think of ascending with anything like a full load with the usual number of hands until a new passage is procured or the present one better graduated. At the Crooked gap (as it is called) the location of the works is very unnatural and of course very injudicious, the passage is made tolerably safe and easy to ascend and descend at some stages of the water at others dangerous and difficult; but of such a form and occupying ground as will cause it to require an annual attention and perhaps oftener, to preserve at all times sufficient depth of water.

Stubblefield Falls are located just downstream from southernmost parking lot at the Carderock, Md., recreation area. Along the Maryland shore there is a long straight channel that appears to be man-made, and which some assume are the remains of Potomac Company works. However, one should note that Thomas Moore said (in the quote above) that the passage through Stubblefield Falls was “in the middle of the river” where there is still a straight channel through the rocks, likely blasted out by the Potomac Company.

Along the Virginia shore at Stubblefield Falls is an impressive set of rock dams that are obviously newly built. In recent times, a recluse has been seen working on these dams. Their purpose appears to be fish impoundment, not navigation.

There are other stone weir ruins in the stretch between Great and Little Falls, some of which may have been fish weirs or old river walls (e.g., the stonework at and near the head of Swainson Island). However, weir ruins in the Calico Rapids (upstream of Stubblefield Falls) and near Cedar Island (much further downstream) are so long and complex that they were more likely constructed for navigational purposes.³⁶

In the Calico Rapids, between Herzog and Turkey Islands, are the ruins of a stone weir structure, hundreds of yards long and running nearly parallel with the current. This structure consisted of a long straight weir and shorter wing weirs that directed water along and downstream of the longer weir.

There is a similar set of weir ruins near Cedar Island in the main channel of the river, the lowest part of which is about 300 yards upstream from the mouth of Cabin John Creek. The ruins appear to have been from two long weirs running in series and nearly parallel with the current, and two shorter wing weirs on the left that must have funneled water near the downstream ends of the longer weirs. The lowermost weir is over 100 yards long. The long lengths and unusual shapes of the Calico Rapids and Cedar Island weirs

make them far different from the simple V-shaped fish weirs found elsewhere in the upper Potomac River, and imply that they served a navigational purpose.



Lower weir ruin near Cedar Island—looking upstream. (D. Guzy)

Little Falls

Little Falls are the last rapids of the Potomac River before tidewater. Their 37-foot fall is about half that of the Great Falls, ten miles upriver. In 1795, the Potomac Company completed a canal bypassing Little Falls, along land crossing the Maryland and District of Columbia border. The company built its first locks in this canal, and replaced them later with its last locks.

John Ballendine's English-trained crew began construction of a canal here in 1774, as part of his broader plan for "clearing the Potowmack River." Ballendine had bought land at the lower end of Little Falls in 1765, settling in "Amsterdam" on the then-Maryland shore. Ballendine aborted his Little Falls effort in 1775 and his canal apparently never was used for navigation. However, the canal must have served as a millrace because later water rights litigation between local property owners and the Potomac and C&O Canal Companies mentioned such a purpose. An 1852 statement made in such a suit noted that the Potomac Company "located and constructed their canal upon the bed of the canal made by Ballendine."³⁷

When George Washington landed at Little Falls during his survey with company directors in 1785, he observed "the Canal begun by Mr. Ballendine." Washington seemed to propose (his words are not clear) extending this canal upstream to a channel formed "by an Island which may be about half a mile above the Falls."³⁸

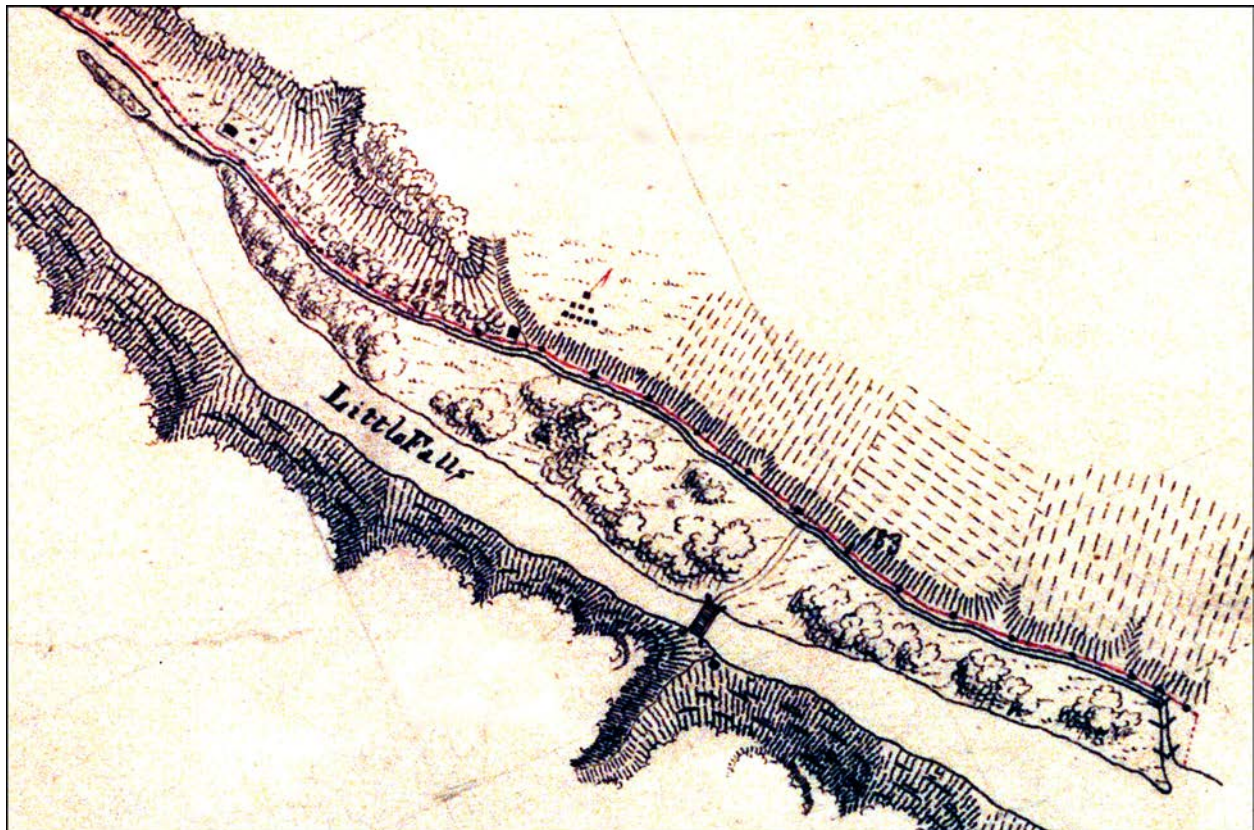
Although the Potomac Company's condemnation of land at Little Falls continued into 1793 (at least for the downriver land), work crews began clearing the right-of-way for the canal in February 1791. By

the summer of 1792, construction of the canal was well underway. As discussed in the company's annual report for that year: "A canal at the little Falls is cut on the Maryland side of the River nearly the whole distance necessary, in general to a full depth, the Stone is swept out and a wall built for nearly a mile. The Digging out of Lock Seats is let out for a specific sum and the work commenced."³⁹

The company's 1793 annual report mentioned labor problems slowing progress. However, the 1794 annual report noted that the wooden "frames of the Locks at the little Falls are put in, planked & walled up," and that the river bed between Great and Little Falls had been cleared for navigation. Washington wrote to Tobias Lear on March 5, 1795: "I am pleased to hear that the Locks which have been erected at the little falls have stood the test of a first trial so well; and this pleasure will be increased if Mr. Weston should make a favorable report of them."⁴⁰

William Weston, the English canal engineer, inspected the Little Falls locks and declared that they "met with his warm approbation." Shortly afterwards, in the spring of 1795, the Potomac Company's Little Falls works began operation.⁴¹

In February 1797, the company advertised that the river between Great and Little Falls had been cleared and allowed boats "to pass with great safety" to tidewater through the Little Falls canal. Similarly, in 1799, the company proudly declared that except for "five hundred feet at Great Falls" (where locks were still under construction), the Potomac had been opened for navigation "at certain seasons" from Georges Creek to tidewater. Because Washington died suddenly on December 14, 1799, before the completion of the Great Falls locks, navigation through the Little Falls works became the greatest engineering accomplishment of the Potomac Company he witnessed.⁴²



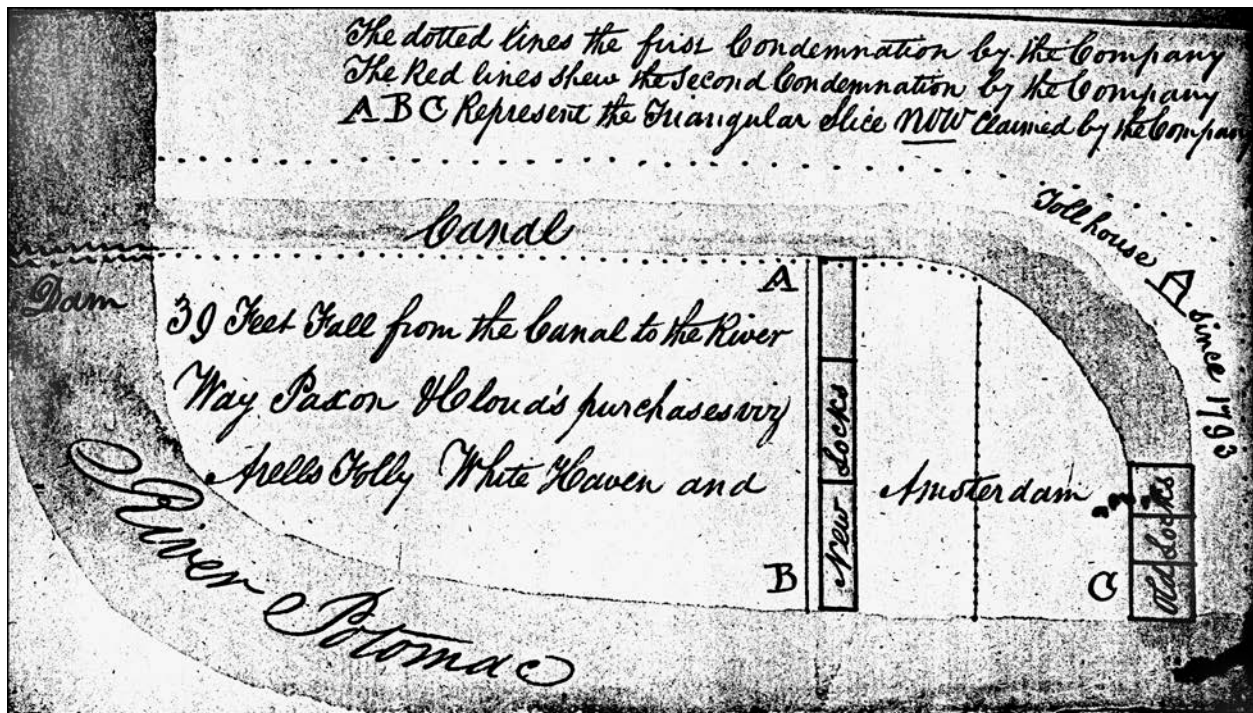
Detail of Little Falls canal from J. J. Abert's 1825 map. (Courtesy of National Archives).
Flow is towards the right. Note wing dam at entrance of canal and locks at downstream end.

The Potomac Company's Little Falls works comprised: 1) a stone wing dam to feed water at the canal's upriver entrance; 2) over two miles of canal channel dug next to the riverine terrace; 3) a guard gate near

the head of the canal; 4) sluice gates and tumbling (or waste) dams along the canal; 5) locks at the downriver end, connecting to tidewater; and 6) a tollhouse. Maps prepared by John James Abert and by James Geddes in the mid-1820s showed the general layout of the canal and locks. These depicted all locks at the canal's downstream end, in a straight section that angled off from the main canal to connect to tidewater. Abert's map showed the wing dam and Geddes' map showed the guard gate. Steven Lewis and Harlan Unrau stated that the canal had "five sluice gates and two tumbling or waste dams 'situated at convenient intervals on its line'." These latter features served to clear silt and debris from the canal. The tollhouse was originally constructed in 1793, and repaired and enlarged around 1816.⁴³

As with all Potomac Company works, the canal and locks at Little Falls needed continual maintenance and repair. Company records document expenses for repairs at Little Falls as early as 1801. The canal filled with sediment and debris, and frost and rot wore at the locks' wooden gates and lock seats.⁴⁴

In 1808, the company declared that the two greatest design mistakes in its entire works were making the Little Falls lock seats of wood, and making them too wide—18 feet wide. While the overlarge size of the original Little Falls locks wasted water and lockage time, the decay of their wooden lock seats threatened to shut down navigation to tidewater. The use of wood as a lock seat material reflects America's inexperience with lock technology at the end of the eighteenth century. Canal makers on the Mohawk River copied the Potomac Company's Little Falls design and suffered the same consequences; their locks rotted within six years. Somehow, the Potomac Company knew to avoid wood in constructing the lock seats at Great Falls.⁴⁵



William Robert's 1816 sketch showing location of old and new locks at Little Falls. (Courtesy of the Library of Congress)

The company decided to replace the wooden locks with stone masonry locks 12-foot wide, using "granite" from the quarry that the company owned at Little Falls. An 1816 sketch (see accompanying figure) shows that the new Little Falls locks were constructed upstream of the old locks. The company had hoped to complete the stone replacement locks at Little Falls while still operating the wooden ones, but the War of 1812 and low toll revenues delayed financing and construction of the new locks. The old locks did not quite hold up. Around 1812, the old wooden locks were "much decayed," and around 1815 they "gave way, in such a manner that it became necessary to renew them entirely." However, the wooden

locks may have been temporarily repaired and operated until late August 1817, when the company reduced its toll rates to reflect the unavailability of navigation through the Little Falls canal. When the new masonry locks began operations on March 2, 1818, the company restored its full rate of tolls.⁴⁶

The company's president and directors felt the stone locks at Little Falls to be "much superior" to those at Great Falls. Upon opening, the new locks were an immediate success and saw "constant use."⁴⁷

From 1819 through 1828, Potomac Company records cited continuing repairs and actions to clean out sediment from the Little Falls works. For example, the company's 1826 annual reported noted: "during the last season [the Little Falls canal was] cleaned out for its whole length, the wall at its entrance has been repaired and heightened, the boat course at its mouth cleaned of the rocks which obstructed the passage of boats, one of the tumbling dams has been made good from its foundation, and other necessary repairs have been completed. Also contracts have been made for the immediate erection of a new pair of upper gates and for the framing of other gates to be in readiness in case of accident or sudden disrepair."⁴⁸

The planners of the C&O Canal initially intended to use the Potomac Company's Little Falls works to reach tidewater, or at least they said so for political reasons. The July 4, 1828, ceremonial groundbreaking for the new canal took place at the head of the old Little Falls canal because canal digging towards Cumberland would start upstream of Little Falls. However, Georgetown merchants soon demanded that the new canal continue down to their port, and that was done.⁴⁹



Detail of stone locks at Little Falls from James Geddes' 1827 map. (Courtesy of the National Archives)

The Potomac Company's Little Falls canal was used until damaged by floods in August 1829. Afterwards, the C&O Canal was built on top of the lower part of the old canal, perhaps covering its upper lock or two. A survey plat by H.W. Brewer shows the C&O Canal following the right of way for "the old Potomac Canal" downstream of C&O Canal Lock 5. The upper half-mile of the old canal became a feeder canal for the C&O Canal, supplying water at the river inlet lock next to Lock No 5.⁵⁰

Appendix III includes summaries of descriptions of the Little Falls works. While contemporary and modern accounts have disagreed somewhat on the number and configuration of the Little Falls locks, most evidence indicates that there were three original wooden locks that were replaced by four stone masonry locks. Geddes' map showed the stone locks arranged in a "combined" (staircase) configuration, in which gates between locks were shared. Good design would have dictated that all locks be of the same dimensions, as the wooden locks were reported to be in 1808. However, no report described the lifts (or depths) of the individual stone masonry locks.

Brewer's survey plat showed the upper half mile of the Little Falls canal, the part that became the C&O Canal's feeder canal, to be narrow with a wide margin of land on the riverside. Today, part of this

margin has washed away to form a side channel to the river. However, the uppermost 200 yards of channel are still narrow and are supported by the remains of stone walls that may date from original Potomac Company construction. These walls appear similar to the walls seen in the Seneca sluice. About 100 yards from the entrance, in the stretch now used for whitewater slalom training, are stone walls on either side about 25 feet apart—the width of the original canal.

Brewer's plat showed the C&O Canal's Dam No. 1 curving out from the head of the canal, following a path similar to that of the Potomac Company's wing dam shown on John James Abert's map. The new dam may have been built over the old. Further out, Dam No. 1 turned almost perpendicular to the river, as now can be seen.

Today, a short stream flows into Lock Cove, fed by a C&O Canal waste weir about a tenth-mile upstream of the Abner Cloud House. On both banks of the stream near the waste weir are stone building ruins, including what appear to be mill ruins along the western bank. The mill ruins are likely those from the Edes-Cloud Mill, which an 1869-newspaper article said "almost occupied" the site of the Potomac Company's locks. Building the mill over the locks, as implied in the article, would explain why the stream does not follow a straight line. At the lower part of the stream, just west of the road through the C&O Canal culvert, is a footbridge supported by parallel stone walls. The location and orientation of these walls, plus their smooth-faced design, imply that they may have been part of the lower stone locks at Little Falls.⁵¹



Ruins of Little Falls lock below footbridge? (D. Guzy)

The Potomac Company's Little Falls canal and locks were among the first in America. While the Potomac Company's canal and locks at Great Falls Park in Virginia are well documented and partially restored, the much longer works at Little Falls have fallen into relative obscurity. There have been few archeological and historical studies, and there is not even a single interpretive sign or marker to note its previous existence. Competitive whitewater paddlers who practice daily on the upper end of the canal know it only as "the feeder canal," not "the skirting canal" or "old canal." The Potomac Company's Little Falls canal and locks should be better remembered.

- ¹ Diary entry for September 6, 1784, and letter to Edmund Randolph, September 16, 1785 (George Washington's papers). Unfortunately, George Washington did not detail the mechanics of James Rumsey's model boat nor his river navigation "discovery." After quitting the Potomac Company, James Rumsey (1743-1792) focused his efforts on building a steamboat, which he publicly demonstrated on the Potomac River at Shepherdstown on December 3, 1787.
- ² Minutes of Potomac Company meetings of August 18, 1785, September 15, 1800, August 2, 1802, September 17, 1802, August 1, 1803, August 5, 1811, August 7, 1826, and August 7, 1828. Letters dated October 9, 1798, and November 24, 1802, and June 13, 1827, "Draft report of the Treasurer in obedience to the resolutions of the Board of August 9, 1826 and June 13, 1827" (Potomac Company records).
- ³ Letter to Thomas Lee, dated August, 1754, and diary entry for August 7, 1785 (George Washington's papers). Nute, page 501.
- ⁴ August 9, 1826, letter from Solomon Buchles to the Potomac Company (Potomac Company records).
- ⁵ Flayle Payne owned "Pains Delight" along the Maryland shore in the 1730s. The island below Paynes Falls was called Payne's Island (Grace L. Tracey's *Pioneers of Old Monocacy*, Baltimore, 1987). Nute, page 501 and pages 717-718. Diary entry for August 7, 1785 (George Washington's papers). The need and effort to further improve Paynes Falls are cited in meeting minutes from June 12, 1795, August 6, 1796, January 6, 1797, October 4, 1797, September 15, 1800, and September 8, 1812 (Potomac Company records). The Potomac Company records also contain a sketch of the "wing wall" drawn by "P. Meyers, Engineer" and dated November 30th, 1796 (see accompanying reproduction). The wing was to have a masonry front and be backed with "rubble work—3 foot deep. The Potomac Company's 1828 annual report mentions improvements made at Paynes Falls (Bacon-Foster).
- ⁶ August 9, 1826, letter from Solomon Buchles to the Potomac Company (Potomac Company records).
- ⁷ Nute, pages 717-718.
- ⁸ Report of August 6, 1792, annual meeting (Potomac Company records).
- ⁹ Letter to Thomas Lee, dated August 1754 (George Washington's papers). For more general information on the navigation at Seneca Falls, see Dan Guzy, "Canal at Seneca Falls," *The Tiller*, Winter 2004, Virginia Canals and Navigations Society, pages 9-13.
- ¹⁰ Nute, page 500. In a private communication, Bill Trout noted that flash locks used on Virginia creeks were typically two to three feet high, less than the four-foot or five-foot gates proposed by Semple.
- ¹¹ A printed copy of Ballendine's *An Estimate of the Expence in Removing the Obstructions in Potowmack River from Tide-water to Fort Cumberland* is in the miscellaneous accounts of the Potomac Company records.
- ¹² Diary entries for August 3, 1785, and September 22, 1785, and letter to Thomas Johnson and Thomas Sim Lee, September 10, 1785 (George Washington's papers).
- ¹³ Letter to James Madison Jr., December 7, 1787 (George Washington's papers). The Virginia border was established at its mainland shore on the Potomac River and North Branch. However, natural and man-made actions have since created new channels and Virginian islands. For example, Lowe's Island, just upstream of the Seneca works, was made by a natural stream change in historic times that resulted in a channel separating land from the shore.
- ¹⁴ January 16, 1790, letter from Thomas Johnson to Virginia Governor Randolph (William P. Palmer, editor, *Calendar of Virginia State Papers and Other Manuscripts*, Vol. 5, New York, Kraus Reprint Corp., 1968, pages 99-100).
- ¹⁵ Potomac Company records that discuss maintenance and repairs of the Seneca works include minutes from meetings of June 6, 1815, July 26, 1816, and August 6, 1821, a December 5, 1820, letter from John Mason to Bernard Peyton, and the "Draft report of the Treasurer in obedience to the resolutions of the Board of August 9, 1826," (Potomac Company records). Repairs at Seneca Falls are also discussed the annual report of 1823 (Bacon-Foster, page 135).
- ¹⁶ See Appendix III for referenced descriptions and dimensions of the Seneca Falls sluice and other major Potomac Company works.
- ¹⁷ In a private communication, Bill Garrett provided information about the ruins at the entrance to the Seneca sluice. His cover article for the June 1987 *National Geographic*, "George Washington's Patowmack Canal," featured photographs of a 50-foot batteau passing through the midsection of the Seneca sluice.
- ¹⁸ Minutes of November 8, 1787, August 6, 1792 and August 1, 1803 meetings (Potomac Company records). Report of August 2, 1802, meeting, and letter from company president James Keith to the Governor of Virginia dated November 24 1802 (William P. Palmer, editor, *Calendar of Virginia State Papers and Other Manuscripts*, Vol.9, New York, Kraus Reprint Corp., 1968, pages 311-313 and 335-337).
- ¹⁹ Bacon-Foster, pages 144-146.
- ²⁰ Osgood R. Smith, *Present Reminders of Early Commerce of the Potomac River above Washington*, 1983.
- ²¹ Diary entries for September 22, 1785, October 18, 1785, February 1 and 2, 1786, and March 2 and 3, 1786 (George Washington's papers).
- ²² Letter to James Madison, December 7, 1787, and diary entry for June 1, 1788 (George Washington's papers).
- ²³ Report of the August 6, 1795, annual meeting (Potomac Company records). The Schuylkill and Susquehanna Canal became part of the Union Canal before the work was completed. In 1786, George Washington and the Potomac Company got the advice of another English engineer, James Brindley, on the Great Falls canal route. Brindley was then working on the Susquehanna canal works and was said to be the nephew of the other James Brindley, the one who built the Duke of Bridgewater's Canal in England. The younger Brindley approved of the Great Falls canal route as laid out in 1786 (George Washington papers: diary entry of March 29, 1786, and letters to John Fitzgerald and George Gilpin, March 31, 1786).

²⁴ “An Act to authorize the Patowmack company to receive tolls on produce carried through the canal at the Great Falls, and for other purposes therein mentioned,” *Maryland Session Laws of 1797*, Chapter 93, passed January 20, 1798. Brent O’Neill, the park ranger at Virginia’s Great Falls Park, told this author that based on the terrain and iron rings in that area, he believed the inclined plane began near Lock 3 and reached the river slightly upstream from the lower locks (Locks 4 and 5). For rock climbers, this location is just upstream from the cliffs known as Aid Box, and downstream of the cliffs known as Romeo’s Ladder and Juliet’s Balcony. For whitewater paddlers, the inclined plane location is just downstream from Wet Bottom Chute.

²⁵ Duke de La Rochefoucault-Liancourt, *Travels through the United States of North America, the country of the Iroquois, and Upper Canada, in the years 1795, 1796, and 1797; with an authentic account of Lower Canada, 1799*, [translated by H. Neuman from French, original published in Paris, 1799] London, R. Phillips, Volume II, pages 334-335.

²⁶ *Call from the President and Directors of the Patowmack Company, dated Great Falls, July 2, 1799* (in Bacon-Foster, Appendix B, page 169–171 and also on the Library of Congress’s *George Washington Papers* website). Minutes of August 4, 1800, meeting (Potomac Company records).

²⁷ December 3, 1801, “Report of the President & Directors of the Potomac Company to his Excellency the Governor of the Commonwealth of Virginia” (Potomac Company records). Minutes of January 5, 6 and August 2, 1802, meetings (Potomac Company records).

²⁸ The guard wall was mentioned in a “Summation of the Investigation at the Great Falls” dated January 1797 (Potomac Company records). The Potomac Company initially tried to use bricks for its locks at Great Falls, but found them to be “not suitable” and in 1796 decided to rely on stone blocks cut from “a very good Quarry of Freestone about the mouth of Seneca Creek” (minutes from August 6, 1796, meeting in Potomac Company records).

²⁹ January 20, 1808, response of the Potomac Company to inquiries by the secretary of the U.S. treasury (Potomac Company records). Other reports said that Lock 5 had a lift of 20 feet (see table in Appendix III.)

³⁰ Maintenance and replacement of the Great Falls locks was mentioned in minutes of meetings for July 26, 1816, August 3, 1818, August 2, 1819, August 7, 1820, and August 6, 1821 (Potomac Company records) and a November 29, 1819, letter from John Mason to Bernard Peyton (in Va. BPW 4th annual report pages 36–40). The canal cleaning machine is mentioned in the December 5, 1821, report from John Mason to Bernard Peyton, secretary of the Va. BPW (in Potomac Company records and also the Va. BPW 6th annual report, 1821, on pages 56–57).

³¹ Minutes of meetings for August 5, 1822, August 1823, July 13, 1825, August 1826, August 1827, and August 1828. (Potomac Company records. The August 1823, 1826, 1827 and 1828 annual reports are quoted in Bacon-Foster on pages 135 and 144–151.).

³² The dismantling of the Great Falls locks in 1830 was mentioned in Bacon-Foster, pages 151–152. Presumably this meant just the removal of gates and hardware because the lock seats still remain.

³³ Minutes of meetings for September 6, 1793, August 4, 1794, May 3, 1802, August 2, 1802, August 1, 1803, and August 3, 1812 (Potomac Company records).

³⁴ Osgood R. Smith, *Present Reminders of Early Commerce of the Potomac River above Washington*, 1983.

³⁵ The Potomac Company’s annual report for 1828 (Bacon-Foster, pages 149–151) noted improvements that year at “Stubbeville Falls,” presumably meaning Stubblefield Falls.

³⁶ In 2000, the author learned of weir ruins at Cedar and Swainson Islands and along Maryland shore at Carderock from Johnna Robinson and Betty Burchell of the Sycamore Island Canoe Club. Jim Cummins of the Interstate Commission on the Potomac River Basin informed the author about the weirs in the Calico Rapids. Tabitha Eagle took aerial photographs of the weirs in Calico Rapids and off Cedar Island that show very complex structures. These photos were included in the first printed edition of this book. Weir ruins are best observed in low water. The author’s ground level photo of the Cedar Island weir was taken on October 29, 2000, when the Little Falls gage was at 2.80 feet.

³⁷ When Ballendine returned to America in late 1774, he held meetings to gain further support and began digging his Little Falls canal. An announcement in the October 25, 1774, *Maryland Gazette* stated that Ballendine’s hands were “at work on the locks at the lower Falls on the river.” June 2, 1852, statement by William M. Stewart in “the Case of Amos Binney Heirs vs. the C&O Company” (in the “Binney Envelope” of the C&O Canal records at the National Archives at College Park, Md.). For more detail on Ballendine’s and the Potomac Company’s works at Little Falls, see Dan Guzy, “The Potomac Company’s Canal and Locks at Little Falls,” *Maryland Historical Magazine*, Vol. 96, 4, Winter 2001.

³⁸ Diary entry for September 22, 1785 (George Washington’s papers).

³⁹ “Work of Potomac Company Hands” (Nute, page 717). August 6, 1792, annual report (Potomac Company records).

⁴⁰ Tobias Lear was both Washington’s personal secretary and a Potomac Company director and president. Although Washington resigned as the Potomac Company president when he became the U.S. president in 1789, he kept a keen interest in the company and oversaw its progress. *The Petition of Capt. George Pointer* (1829, in the C&O Canal records at the National Archives) said that Washington inspected the company’s works each October. In a June 25, 1794, letter to Henry Knox, Washington noted he wrenched his back controlling his horse while on his way to inspect the Little Falls canal and locks (Washington papers).

⁴¹ Annual report from August 6, 1795, meeting (Potomac Company records).

⁴² *Bartgis’s Federal Gazette, or the Frederick-Town and Country Weekly Advertiser*, February 23, 1797. *Call from the President and Directors of the Patowmack Company*, July 2, 1799 (Potomac Company records).

⁴³ The specific features for the Little Falls works are discussed in Steven H. Lewis, *Stabilization Study, Little Falls Skirting Canal: Maryland and District of Columbia* (Washington D.C., National Park Service, August 1966) and Harlan Unrau, *Historic Structure Report, Dam No. 1 and Associated Structures, Historical Data, Chesapeake and Ohio Canal National Historical Park*,

MD–DC–WV (National Park Service, Denver, Colorado, May 1976). The Little Falls tollhouse is mentioned in William Roberts' testimony in House Report No. 116, pages 9–10, and shown on Roberts' map.

⁴⁴ August 3, 1801, annual report (Potomac Company records).

⁴⁵ January 20, 1808, response of the Potomac Company to inquiries by the secretary of the U.S. treasury (Potomac Company records). Archer Butler Hulbert, *The Great American Canals—Volume II, The Erie Canal* (1971 reprint of 1902–05 first edition pages 34, 35, and 41.) Although William Weston approved the Little Falls locks, he had used sandstone and brick to construct his own locks on the Schuylkill and Susquehanna Canal (Dean M. Aungst, *The Two Canals of Lebanon County*, Lebanon Co. Historical Society, 1968, page 15).

⁴⁶ The sketch is William Roberts' *Diagrammatic map of real property* . . . , 1816 (Library of Congress, control no. 90684578). This schematic drawing of the Little Falls canal and both sets of its locks must have been part of Roberts' testimony presented in House Report No. 116. December 9, 1817, letter from John Mason to Bernard Peyton, secretary of the Va. BPW, minutes of April 6, 1818, meeting, and August 25, 1817, and March 2, 1818, letters from John Mason to Lewis Sewall (Potomac Company records)

⁴⁷ March 2, 1818, letter from John Mason to Lewis Sewall (Potomac Company records). December 18, 1818, report from John Mason to Bernard Peyton, secretary of the Va. BPW (Va. BPW 1818 annual report).

⁴⁸ August 7, 1826, annual report (Potomac Company records).

⁴⁹ In a private communication, Karen Gray explained that Charles Mercer initially avoided a decision on the eastern terminus of the C&O Canal to ensure the support of the competing port cities of Georgetown, Washington, Alexandria, and even Baltimore. The eventual location of the canal terminus at Rock Creek in Georgetown was part of a compromise in which the C&O Canal Company promised to build a branch canal to the Washington City Canal, and help Alexandria get Federal support for a branch canal to that city.

⁵⁰ Harlan Unrau, *Historic Structure Report*, page 1. Steven H. Lewis. *Stabilization Study, Little Falls Skirting Canal*, pages 13–14. Bacon-Foster, pages 151–152, said: “The old [Potomac Company] works were used until 1830, when the locks at Great Falls were dismantled and abandoned. The canal at Little Falls was long used in its original state.” Perhaps she was referring only to the upper part of the old Little Falls canal. H. W. Brewer, *Plat of Survey of the C&O Canal from Stone No. 12 to Stone No. 1 & property acquired by the Canal Company from Henrietta Marie Brook*, no date (in National Archives map collection, Record Group 79, C&O Canal Series, No. 43).

⁵¹ Allen C. Clark, “The Old Mills” (*Records of the Columbia Historical Society*, Vols. 31–32, 1930, pages 81–116) discussed the Edes-Cloud Mill. Clark's article cites information about the location of this mill taken from the September 21, 1869, *Evening Star*.

Conclusion

Some are quick to dismiss the Potomac Company as a failure. However, we should not judge the success of first ventures solely on their profits. The Potomac Company should be considered as an initial evolutionary step toward opening routes to the West from the mid-Atlantic coast. The company's successors were not only the Chesapeake and Ohio Canal, but also the more profitable National Road (with extensions through Maryland) and the Baltimore and Ohio Railroad.

But there is no escaping the fact that the Potomac Company failed financially. The company never overcame its debts. It received its first toll revenues after unexpectedly prolonged construction delays, and these revenues could barely cover maintenance costs. Construction costs were over twice what were originally estimated, even before the company was forced to install expensive new locks at Little Falls. Except for one small dividend, the stockholders never profited.

The War of 1812 and the subsequent loss of flour sales to Great Britain greatly changed the ever-increasing flour production, shipments, and tolls collected. One study noted that the Potomac Company's finances suffered from a combination of factors. That is, the national economies of the post-Revolutionary period and during the War of 1812 were unstable. Private investors were more inclined to speculate in land to be served by improved Potomac navigation rather than in the Potomac Company itself. Attempts to raise revenue through lotteries backfired when lottery tickets had to be sold on credit, and unlucky ticket holders would not pay. While the states of Maryland and Virginia were investors, the project lacked the more substantial financial backing that might have come from the federal government. The originators of the C&O Canal learned from this and successfully lobbied Congress for major financial support for the project that succeeded the Potomac Company.¹

From a political view, the Potomac Company was indeed a success. Led by the charismatic George Washington, the Potomac Company got all the state charters and legislation it needed for rights of way, tolls, and construction delays. The Mount Vernon Compact in 1785 challenged the Articles of Confederation with its interstate agreements between Maryland and Virginia on Potomac River navigation and commerce. This inspired the Annapolis Convention of 1786, which in turn led to Philadelphia's Constitutional Convention of 1787. Some have speculated that there might not have been a U.S. Constitution without the actions that led to the Potomac Company.

From an engineering view, the Potomac Company was a limited success. That is, its sluices, canals and locks were far from optimal and required continual maintenance, but they generally worked as intended. Given America's lack of canal knowledge and experience at the time, the Potomac Company's engineering achievements were remarkable. In 1970, the American Society of Civil Engineers designated the "Potowmack Canal and Locks, Great Falls, Virginia" as a historic civil engineering landmark. The Society might have also recognized all the other Potomac Company works, but perhaps their place in history suffers from their greater state of ruin.

A key factor that caused the joint commissioners and others to turn away from in-river navigation and toward recommending an independent canal was the problem of low water levels in the Potomac's upper stretches during dry seasons. The commissioners characterized this as a design problem. However, the underlying causes may have been more meteorological and environmental than engineering. The unusually long and severe drought of 1818 through 1823, coupled possibly with effects of deforestation on ground water supplies, doomed navigation on the upper stretches of the Potomac.

We should note that the riparian environment along the Potomac River that flour boats floated down in 1820s was different from the one George Washington canoed down in 1754, or again in 1785. The extensive cutting of trees for charcoal and other industrial uses, and the clearing of land for agriculture caused more rapid precipitation runoff. One study measured the runoff from cultivated land to be more than thirty times greater than that of a forest.²

The greater runoff of deforested land resulted in greater floods in wet seasons and greater amounts of sediment released into the river, which created shoals and clogged the navigational works. Greater runoff

also resulted in lower ground water supplies, which in turn would have a lesser effect on replenishing streams and rivers during dry spells.

For those interested in the Potomac Company, a visit to the Great Falls Park in Virginia would be very rewarding. The relatively well-preserved canal and lock seats plus excellent displays at the park will give a good understanding of the company's major works there. However, the Great Falls works should be seen as an exception to the many other navigational works the Potomac Company built, most of which were in-river sluices and walled channels along the shore. The remains of some of these other works can still be found, but the search requires knowledge and effort because all are unmarked. With the exception of the House Falls sluice, all other Potomac Company works are non-functional today.

For most of their trips, the Potomac River batteaux and flatboats traveled on open water, not inside sluices and canals. Is it possible to duplicate that open water experience today and, to paraphrase Heraclitus, "boat on the same river twice?" Not fully, certainly not for the days-long trips made during the Potomac Company's operation. Rivers change over time. Sediment collects where streams slow down. River bends and islands can gradually move downstream. For example, it is easy to surmise that the islands that today block the river crossing at Nolands Ferry were not there in colonial times when the ferry was in operation.

The most significant river changes were man-made. The C&O Canal's seven feeder dams created upstream slack water areas that widened and deepened the river, covering previous navigational obstacles such as Cumberland and Garrison Falls, and the four ledges the joint commissioners called "the Fiddle Strings." In locations where the C&O Canal was built right along the Maryland shoreline, adjacent channels would be covered over, as happened to the Potomac Company's long canal at the Shenandoah Falls. And some suspect that whole islands were dredged away as sources of fill for building the canal and railroad.

Fortunately, the upper Potomac River is not completely dammed now like some other rivers once used for navigation, and we can still paddle our boats over ledges, riffles and through island channels. The C&O Canal parkland blocks most of the modern development on the river's Maryland side, as do sporadic parks and undeveloped areas along the Virginia and West Virginia shores. Applying a good dose of imagination, one might extrapolate the modern experience of paddling a 16-foot canoe through a ruined Potomac River fish weir to that of maneuvering a 70-foot flour boat down a sluice.

¹ Douglas R. Littlefield, "The Potomac Company: A Misadventure in Financing an Early American Internal Improvement Project," *Business History Review*, Winter 1984, pages 562–585.

² The runoff study was for land on an eight-percent slope in Statesville, N.C.. Ref: *Conquest of the Land through 7,000 Years*, Agriculture Bulletin No. 99, US Department of Agriculture, pages 21 and 22, written in 1938 and 1939.



Boatman using the front sweep to steer through white water in a replica batteau—looking downstream. (D. Guzy)

Appendix I – Report of Thomas Moore’s 1820 Potomac River Survey

The report of Thomas Moore’s 1820 Potomac survey was issued in several forms, including two handwritten versions in the Potomac Company records and as part of *House of Representatives Report No. 111* (for the 17th Congress, 1st Session, May 3, 1822, pages 19–27). Appendix F of Bacon-Foster’s book (pages 197–206) reproduced the letter from Moore to John Mason, but excluded two paragraphs concerning “material errors” in sluice navigation design.

The following is copied verbatim from the *Fifth Annual Report of the President and Directors of the Board of Public Works to the General Assembly of Virginia* (Richmond, printed by Thomas Ritchie, 1820, pages 46–55).

The Potowmac River and Its Connection with the Ohio

Having ascertained that much travelling and expense would be saved, by making the examination of the country between the Potowmac and the western waters, to succeed the survey of the Monongahela, when I should be on the ground, with the instruments necessary for the purpose, and the view of the Potowmac to succeed that examination, instead of first going to the New and Holstein rivers, and then returning to the same ground, and being persuaded I should be able by adopting this course, to complete the whole in good time, I ventured to depart a little from the letter of my instructions in this respect. Accordingly, on the 30th of the sixth month, 1820, I commenced the examination.

From the topography of the country it appears, that a communication between the Potowmac and the Ohio, ought to be either by way of the Cheat, or Youghiogany rivers. With regard to the former, that part which passes what is called the Dunkard’s bottom, appears to approach as near to the Potowmac as any other point that can be considered practicable for navigation. From this place for about five miles downwards, the fall is not too great for sluice navigation; but then a fall occurs of nearly 30 feet by estimation in one mile; the lower part of which is too abrupt and broken to be improved by any other means than by a lock. From thence to the mouth of Sandy creek, about 8 or 9 miles, the fall is great; particularly at one place, where it much exceeds, for the distance, the fall just described. Thence through the Laurel Hill to Henthorn’s quarry, by estimation 10 miles, the fall is comparatively much less. I saw a part of this section, and had a particular description of the remainder, from which I suppose it does not exceed 10 feet per mile, and not too abrupt in any one place to be overcome by sluices. Thence to the junction with the Monongahela, about 12 miles, it has been declared navigable by the laws of Virginia.

It appears then, that if this river is used, a great expense of lockage will be incurred on one section of about 10 miles. The remainder may be made a tolerable sluice navigation for about 8 months in the year, except when interrupted by ice.

From the Dunkard’s bottom to the mouth of Savage river, on the north branch of the Potowmac, is 37 miles. But to Crabtree river, a branch of Savage river, at Swan’s old mill, the highest point of practicable canal navigation, the distance is only 27 miles. The present road between those points is injudiciously located, and is in many places very steep. I think, however, a road may be had within 5 degrees of acclivity and declivity without increasing the distance.

If the waters of the Youghiogany should be preferred, then a branch called Deep creek will be the most eligible. There are several branches of this creek, which form a junction and compose a stream which may do tolerably well to supply the summit level of a canal. This junction is about 2 miles west of a low gap in the Alleghany ridge, which has been long spoken of as a suitable point of connection between the eastern and western waters.

From this gap the levels were taken both ways. It was found that the fall westward to the point mentioned on Deep creek, was 204.03 feet. The fall eastward, to the junction of the two branches of

Crabtree run, just above General Swan’s old mill, is 340.90 feet. The distance by estimation rather less than 2 miles.

The fall from the last mentioned point to the mouth of Savage river, is 1366.71 feet. The distance not measured, but believed to be about 13 miles.

It appears then, that the waters of Deep creek is 136.87 feet higher than the water of Crabtree run at Swan’s old mill, and of course might be brought through by a tunnel, and discharged into the Potowmac. But in case of a canal navigation, the tunnel would be on the summit level, and the water of Deep creek would supply locks both ways.

This creek lies in the Glades, and the ascent from it towards the ridge, but small for a considerable distance. I think, therefore, that by driving up an open canal as far as the ground would permit, and then taking the shortest possible distance to the level on the other side, that the tunnel would not exceed 2 miles in length. I believe a road might be made across the ridge from one point to the other, that is, from Deep creek to Swan’s mill, at 3 degrees, that would not exceed 5 miles in distance.

Deep creek flows through the Glades 10 to 12 miles below the before-mentioned point, and then, with a rapid descent (as I am told) falls into the Youghiogany. From this junction to the national road, I have seen this river but partially. I know, however, from former surveys, that at the crossing this road, the water is many hundred feet nearer to the level of tide water than the water at the forks of Deep creek.

From the national road to the falls, I am acquainted with the bed of the stream: In this section the fall is very great. Above the Turkey foot, where the three branches unite, which is about 6 miles below the road, the stream is too inconsiderable to be used as a river navigation, except in freshets; and below the Turkey foot is too rapid and dangerous, quite to the foot of the falls on the western side of Laurel Hill: So that a canal and lock navigation must be adopted from the first mentioned point on Deep creek, to the last mentioned on Youghiogany. I am not in possession of data, to determine exactly the whole fall in this distance: but in round numbers, there will probably be not much over or under 1700 feet to be overcome by locks.

On the eastern side, from the end of the Tunnel to Swain’s mill, the fall will be 136.87 feet, and from thence, as has been stated, to the mouth of Savage river 1366.71 feet, making the whole lockage 1503.58 feet.

From the mouth of Savage, to the mouth of New creek, a distance of 8 miles 33 perches, the fall, by the levelling of Col. Gilpin and J. Smith, is 190 feet 8 inches: which is rather more than 23 feet per mile. As this fall is tolerably regular, it may perhaps be made safe for descending boats 4 or 5 months in the year; but it will always be excessively laborious to ascend with any loading: So that to make the navigation materially useful for the western trade, the addition of 190 feet must be added to the before-mentioned lockage.

From the mouth of New creek to Cumberland, $22\frac{1}{4}$ miles, the fall is 254 feet; the average per mile $11\frac{1}{2}$ feet. On this section some money has been very usefully expended, and with a little more improvement, might be rendered navigable for keel boats carrying 100 barrels of flour, 6 months in the year.

The examination of the river from Cumberland, downwards, was commenced on the 10th of the 7th month; the water having fallen very rapidly for the last 3 or 4 days preceding. It was then believed to be lower than usual at the same time of the year. I think if the water had all been collected in a 20 feet sluice, and flowing with a velocity that would be acquired by a descent of 6 inches per 100 feet, it would have given about 10 inches of water. The work that has been done for the first 9 or 10 miles, is not in every part as well designated as I think it might have been; but much better than is usually seen. There has been, however, more money expended on some parts than necessary, and other parts left unfinished, which require the expenditure of a small sum to render the whole in the greatest degree useful. Thence down to the mouth of the South branch, the river has been partially improved, but for want of a little annual attention, many of these improvements are gone out of repair; a moderate sum would place the river from Cumberland to the South branch in a tolerable state for sluice navigation, where there is a sufficiency of water, which perhaps cannot be counted on more than half the year.

Below the mouth of the South branch, there was a sufficient quantity of water to give at least 15 inches depth, in a well graduated sluice. The bed of the river below the junction of the two branches becomes wider, and of course improvements will generally be rather more expensive. Many of the worst places above Hancock town have been a little improved. At the tumbling dam falls there is a good sluice, except that it requires a further extension of the lower end, to diminish the fall in that part, which is very hard to ascend. But at the bare falls just below, there has been a long sluice made many years ago; the location of which, on a convex shore, is so very injudicious, that it is nearly filled with gravel, and will probably soon be rendered entirely useless.—There are some others that are of little service; some of them have been spoiled by the interference of fish dams; several of these are a serious injury to the navigation. There are many shallow places which required improvement, in this section, but none that need be expensive. I think the proper expenditure of 5 to \$6,000 would now give water for keel boats with 100 barrels of flour at all times except in unusually dry seasons, from the South branch to Hancock town.

From Hancock to Williamsport, very little has been done to improve the navigation, or at least there are at present but few visible remains of such efforts. The greater part of this distance requires but little; I think from 2 to \$3000 would be quite sufficient to effect all that is necessary to be done on this section. From Williamsport to Shepherdstown, it does not appear that any labour has been performed in the bed of the river. But little is necessary, yet there are a few places that might be improved.

Just below Shepherdstown, a long shallow ripple occurs. The river is wide, and no connected channel, either natural or artificial, is to be found through the shoal. The water ought to be collected, and a little swelled by wings in proper directions; 5 or \$600 judiciously expended, would probably render it permanently good. The navigation is then good to the head of the long canal, at the beginning of the Shenandoah falls. The entrance of this canal is somewhat difficult in high water; it may be rendered safer by extending a pier a short distance into the river on the lower side, to prevent the strong draft of water just without the present entrance. The current is very rapid through the canal; but with care, safe to descend. The ascent is very laborious; but is much facilitated by a substantial wall, and tracking way where ropes can be used to great advantage.

About ½ mile below the ferry, are two short canals (called by the boatmen the Bull Ring Falls;) taken together, with a short sheet of smooth water between them, the distance may be ¼ mile; the fall is 6.06 feet. Opposite this point, McPherson and Brion have proposed to erect iron works, if a compromise can be made with the Potowmac Company. If such an arrangement was made, the canal above the works ought to be sufficiently capacious to admit water for the works and also for navigation and any other purposes, which the company may have occasion for, at a point rather more than ½ mile lower down; where there should be a lock to descend into the river, and where the fall will be 8.80 feet.

The fall from the head of Shenandoah falls, to the landing at Harper’s ferry, is f. 26.75; this was ascertained, by finding the difference in the levels between the surface of the water in the United States’ Canal, when the gates were all shut, and the water at the landing.

From the lower end of the Bull Ring to Payne’s Falls, the navigation is troublesome in low water; it requires swelling, so as to give 6 or 8 inches more water, and the course straightened. At these falls, Basil Deavers is now erecting a milldam, I suppose without permission of the company, but if the sluice and some other works are completed agreeably to what he proposes, the navigation will be rather improved than injured. The river below, for some miles, is wide and shallow; swelling the water will be the best remedy.

From the Bull Ring Falls, for 6 miles downward, I think the cost of improving may be estimated at \$500 per mile; though I am well satisfied a less sum would answer the purpose, if the best economy could be adopted in the expenditure. A little improvement is necessary in the low water course, between the lower end of the long canal and Harper’s ferry.

From the head of the island above Noland’s ferry, to about 1½ miles below, there are several very shallow places, with but little fall. They ought to be improved by a few low dams of brush and stone; the expense would be little, if managed to the best advantage. There is perhaps, a less depth of water on these shoals, than is found at any other place below Harper’s ferry. From these shoals, to Seneca Falls, very little improvement is necessary; in a few places the removal of some loose stones would be useful.

The dam of the Seneca Falls requires repairing, so as to turn more water into the canal. At present there is not enough to float our little skiff; we were under the necessity of going down through the falls. Boatmen who are well acquainted with this outward course, may pass down with safety; but it is very hard to ascend; there certainly ought to be at least as much water in the canal, at all times, as would float an ascending boat with a small load. Between the Seneca and the Great Falls, there has been done some work, to improve the bed of the river; generally to pretty good effect; but for want of timely attention, some of these works are gone out of repair, and do not answer the purpose intended.

The greatest obstruction to the navigation any where below Williamsport, in the present state of the water, is at the Great Falls. The dam requires repairing and extending, so as to give at least 6 or 8 inches more water in the canal. At present boats with only 50 barrels are obliged to make double trips; and when there are several in company, there is great detention for want of water to supply the locks.

The bed of the river from the Great Falls to the head of the Little Falls Canal, is generally very rough; much labour has been bestowed on it, for the improvement of the navigation, which has in a considerable degree produced the intended effect. But something still remains to be done, in order to give sufficient depth of water in all places; and also, to render the falls more easy for ascending boats at all stages of the water. The making of the tracking way over the rocks more perfect, appears to be the most important part of the work. The current for some distance below the falls is so rapid in high water, and likewise so deep, that it renders useless the common means of ascending by setting poles; and the unevenness of the crags on shore, makes it extremely difficult and dangerous to carry a towing line over them. Yet this expedient has to be resorted to. It is very probable that where the rock is smooth, or at the turning of particular points, a chain might be attached to the rocks by ring bolts or pins, so as to be very useful; it might be light, and might be a cheap improvement.

At Stubblefield Falls, the pass is safe for descending boats, except that the rapidity of the current over the uneven bottom produces a roughness, that, when full-loaded, causes them to ship water; but the angle of ascent is so great, and the sluice being situated in the middle of the river, where no advantage can be derived from towing, that it is in vain to think of ascending with any thing like a full load, with the usual number of hands, until a new passage is procured, or the present one better graduated. At the Crooked Gap (as it is called) the location of the works is very unnatural, and of course injudicious. The passage is made tolerably safe and easy to ascend and descend at some stages of water, at others, dangerous and difficult; but of such a form, and occupying such ground as will cause it to require an annual attention, and perhaps oftener, to preserve at all times a sufficient depth of water.

I think it may be relied on, that from 18 to \$20,000 would now place the navigation in such a situation that boats carrying 100 barrels of flour might descend the river at all times, from the mouth of the South Branch to tide water, except in an unusually dry season, from above Williamsport for a short time, or when prevented by ice. But in this calculation, I should certainly contemplate a more economical expenditure, than has commonly been made in this description of improvement. Two material errors have very often been made in the construction of works for this purpose. The first is, the unnatural *location* and improper *shape* given to the works; whereby, it often happens, that when the water is a little raised, but not so high as to float a boat over all the works, a strong current sets obliquely across some of the walls, and it requires great exertion to prevent boats from being wrecked, on the very works designed for safety; or when sluices are made on a convex shore, they must inevitably fill with gravel, because the current is always slack in these situations, and the gravel that may be brought down by a strong current above, must there find a place of rest, from the absence of a sufficient power to propel it further; whereas, were these sluices made in a perfectly natural direction, there would be no tendency in the boats, to run on the walls, because there would be no strong current setting at an angle across them. Boats would generally pass through the sluices, even without the aid of a steersman, nor could they fill with gravel, because the current would pass directly through them, and always with an accelerated velocity. There are some sluices in the Potomac, and also in other rivers which I have examined, that have been made in a proper direction, not one of which have ever filled with gravel or stone. In my report to the Board of Public Works, for the year 1818, I have endeavored to give a scientific explanation of the principles that must be

adhered to, in procuring a stream navigation, if ever it succeeds in a tolerable degree; and to which I refer, for further information on this subject.

The second material error, that is too generally fallen into, is the adoption of plans that are unnecessarily expensive in the execution; one is the excavation of channels in the bed of the river, instead of swelling water over shallow places. This practice, however, is losing ground on the Potowmac. I find the most intelligent boatmen and others have become convinced that the end is more cheaply as well as more certainly attained, by increasing the quantity of water within the banks of the river, than by diminishing them by means of these artificial channels in the bed at the shallow places; but it often happens, that to effect this object, a great deal of unnecessary expense is incurred; large quantities of stone are frequently collected, and in some instances, regular faced walls, of 5 to 8 feet in width, and much higher than necessary, are built out in the stream, to form a wing, on the side of a sluice, that would in every respect be better effected by a small line of brush and stone, intermixed with gravel, and which would not cost 1-4 or perhaps 1-6 of the money. The proper rule for building of these, is to keep them as low as possible to answer the purpose. When the sluices afford just water enough for the purpose intended, the surface should be every where level with the dams and sides of the sluices; they are then less liable to be affected by ice, and they are sooner out of the way of descending boats and rafts on rising water. It is generally better to make two low wings or dams than one high one; in part for the reasons before given, and also because the sluices will present less difficulty in ascending.

But when the powers of art have been exerted to the utmost extent, to produce an easy navigation in the bed of a stream, still it must hold a very inferior grade to that of an independent canal; because the natural fall of the river must be overcome by the labor of men; and if the whole fall of a river is great in proportion to its length, it will require a great number, in proportion to the tonnage; and therefore must be very expensive compared with a canal furnished with locks, where the loaded boats are drawn on level water by the labor of horses. But this kind of improvement requires large funds for carrying it into effect, and should not be undertaken until the period arrives that gives a reasonable prospect of remuneration from the trade that may be carried on through its channel. The transportation, however, on such a canal, is so much cheaper than by any other means of internal improvement, that it may happen, and I believe sometimes does happen, that such a period arrives, before those concerned think of making a single calculation on the subject. Knowing the great superiority of this mode of improvement, and believing it may possibly be at some time adopted on the Potowmac, I have so far made myself acquainted with the grounds adjacent to the river, as to enable me to form some estimate of the expense of an independent canal from Cumberland to the great falls.

I have in my notes such a description of these grounds as could be obtained from the river without a minute examination on shore. From these, it does not appear that the excavation would be more expensive than the contemplated canal on the James river, nor the walling greater in proportion to the distance. It was found from the prices given for removing earth and other work incident to the construction of a canal, that the one just mentioned ought not to cost more than about \$4,300 per mile, exclusive of the lockage. From Cumberland to the great falls is 176 miles, which multiplied by \$4,300 gives \$756,800.

The fall in that distance is 572 feet, which multiplied by \$625, the price per foot at which such lockage is estimated, gives \$357,500.

Amounting to, \$1,114,300.

This, when compared with the cost of some other canals, appears to be a low estimate; but it is to be remembered, that canals conducted on low levels along the ravine of a river, have no deep vallies or ravines to cross, as those must necessarily have on high levels in an uneven country, and therefore the great embankments and elevated aqueducts, which constitute the largest items of expense in many canals, are avoided; the calculation is also made for a canal and locks of a moderate size.

On such a canal as this, the actual cost of transportation for a barrel of flour from Cumberland to the great falls, would not exceed 15 cents, nor a bushel of coal 6 cents, and other articles in proportion, provided the boats were supplied with $\frac{1}{4}$ back load of plaster of Paris or any thing else, at the low price of \$3 per ton.

It is for those who are concerned, and who are better acquainted with the present trade of the river and the future prospects, to calculate whether such a toll can be added to those prices, as will pay the interest on the capital above stated, and also the necessary additional capital for continuing the canal to tide water. Several considerations presented relative to this lower section, which I thought required more time to digest than I felt myself authorised to take; particularly as some of them were of such a nature as to place them without the line of my duty for decision. I did not therefore take any notes relative to the ground for or expense of an independent canal below the great falls.

The section below Harper’s ferry would be the least expensive for the distance.

Having given this description of the river, and the foregoing estimates, it must remain with the company, after consulting the state of their funds, and other circumstances, over which I can have no control, to determine on the most proper mode of expending money in future on this very important river. And particularly whether more minute information ought to be obtained relative to the improving the different sections of the best of all possible plans. For, notwithstanding the cost in the first instance may appear discouraging, yet the object is a great one, even as it regards the legitimate trade of the country watered by the river and its branches, but it derives great additional importance from the circumstance of the national road being already made, and offering the means of connecting the trade of this river with the western country.

Since the foregoing was written, I have been informed that the improvements recommended at the great falls have been executed, and that there has since been an abundant supply of water in the canal, even when the river was at the lowest.

Appendix II – Potomac Navigation as Described in The Joint Commissioners’ Report of Their 1822 Survey

Isaac Briggs was the primary author of the report for the 1822 Potomac River survey by the joint commissions from Maryland and Virginia. Briggs was not initially part of the survey and depended on notes taken by his brother-in-law, Thomas Moore, the principle engineer of Virginia who died during a pause in the survey. The joint commissioners’ report concluded that the Potomac Company’s river improvements were inadequate to make the river navigable in dry seasons, and that an independent canal along the river (what would become the C&O Canal) was the most practical alternative. The report discussed the pros and cons of navigational schemes, documented Potomac Company finances, and detailed river conditions from below Cumberland to Goose Creek as observed in August and September of 1822. The survey halted at Goose Creek due to sickness of all the commissioners.

In December 1822, following the death of Thomas Moore, Isaac Briggs and three of the joint commissioners completed the Potomac River survey, traveling from Goose Creek to the Potomac Company’s Little Falls canal. A separate “Report on the Potowmac” (dated January 23, 1823, and published in the 8th annual report of the Virginia Board of Public Works, 1824, pages 11 through 65) covered this last stretch, but did not describe navigational structures and river conditions as thoroughly as the joint commissioners’ earlier report did. The second report also summarized the level, line, and estimated cost of the new proposed independent canal (\$2,000,000 total from Cumberland to Little Falls).

The first (and main) report of the survey contained very unique and detailed information about Potomac River sites and navigational conditions in 1822. The reader should note that the joint commissioners conducted the survey during a severe drought that made river levels very low. The reader should also be aware that there are differences in the published versions of this report:

1. The Maryland version: *Message of the Governor of Maryland: communicating the report of the Commissioners appointed to survey the River Potomac*, Annapolis, printed by J. Hughes, 1822.
2. The U.S. Congress version: *Letter from the governor and council of Maryland, transmitting a report of the commissioners appointed to survey the river Potomac*, Washington, printed by Gales & Seaton, 1823. (Parts of this report were reproduced in *House of Representatives Report 46 of the 17th Congress*, and in *American State Papers No. 38—Miscellaneous Report 535—17th Congress, 2nd Session*)
3. The Virginia Board of Public Works (Va. BPW) version: *Report of the Joint commissioners of the Potowmac River, with sundry documents*, Richmond, Va., printed by T. Ritchie, 1823
4. “Internal Improvements—Potomac Canal,” *Washington Quarterly Magazine*, Vol. 1, No. 1, July 1823, pages 1–29. (This reproduced much of the joint commissioners’ report.)

The Maryland and U.S. Congress versions (1 and 2 above) are nearly the same and are the ones most often referred to. The Va. BPW version is more complete and better edited, leaving out some extraneous information presented in the other two versions. It clarifies that the joint commissioners’ survey started from Cumberland and that observations on the North Branch near Cumberland were not covered in the report because the survey notes for the initial stretches were mislaid. It also discusses the role Thomas Moore played in the survey and the impact of his death shortly afterwards.

There are many spelling, punctuation, and name differences between the Va. BPW version and the Maryland and US Congress versions. However, because most of the text is identical or similar, all versions appear to have been transcribed from the same notes.

The following will present key excerpts from the Va. BPW version of the joint commissioners’ report. In places where the Maryland and U.S. Congress versions presented significantly different information, that information is added below inside brackets of this type { }. Notes and clarifications by this author are added inside brackets of this type [].

The Present State of the Navigation

It has been stated, and is believed by many persons, that the river Potowmac, in its present condition, is navigable nearly half the year. The Potowmac Company are required to give a low water navigation, of a foot deep, throughout the year. This circumstance, and the idea entertained of the possibility of confining the waters in the bed of the river, to narrow sluices, have confirmed this opinion. The commissioners have given a minute examination to this branch of the duties imposed upon them, and satisfied themselves, from their own observations, and the most careful inquiries, that no such blessing is enjoyed by the fertile districts, through which the river flows.

The floods and freshets give the only navigation at present used. They occur usually from the first of September, to the 20th of June; variously however, in various years, and it so happens that although boats are known in some years to pass down through each of the months intervening between these dates; yet, in consequence of ice during winter, and the short continuance of a flood giving navigable water, the average duration of the boating time in a course of many years, does not much, if at all, exceed eight or ten days passable water, for full-loaded boats late in the year, and from 25 to 30 {Md. & U.S. Congress versions say “thirty five.”} days in the spring of the year; making the whole time when produce and goods can be stream-borne in the course of one entire common year, from thirty-three to forty-five days ... [The text goes on to discuss the difficulty in navigating the river in even high water.]

Sluice Navigation

As what has been called sluice navigation, has been the kind adopted by the Potowmac company, and the one on which so large a part of their funds has been expended, it may be necessary to give an explanation drawn from actual observation, of what has been done and tried for many years of this kind of work on the Potowmac.

The sluices on this river are of three kinds. The first, which are chiefly found in the upper part of the river, are channels formed by low walls. The second, are channels formed by excavating the rocky bottom of the rivers. The third kind, which are yet used, and have been of service to the navigation in high water, are channels opened near the banks of the river around the rapids and small falls in the current, as at Harper's Ferry, Payne's Falls, &c., to avoid the great force of the torrent in mid stream in such situations, and with the view of giving the boatmen a land path on the bank, on which by a rope they may drag the boat up the stream, when the violence of the current is too great to be overcome by setting poles. These channels, though used, are of very imperfect and temporary construction, the bottoms of no one of them being graduated. They are certainly too imperfect to be called canals, although such is their common appellation. The two first of these kinds of sluices, are formed on erroneous principles, and have failed to render any service to the navigation of the river. The errors in the first requiring detail will be presently explained.

The errors in the second kind, or in excavating channels in the bottom of the stream, consist in attempting on a long line of a stream, inclining all the way in its whole length, to regulate the depth by partial cutting or deepening the bottom. Unless you bring water to a level the whole length of the line of its stream, any partial cutting or deepening in spots along the line inclined, only serves to transpose a shallow a little further up the line, or to make hollow basins of no service; and in a river where the chief failure in its navigation, arises from the too long and too frequent deficiency of depth of water, necessary for boating, owing to the great inclination of the plane of its stream, and to its consequent rapid discharge of water, if you smooth the plane by removing all obstructions, the rapidity will of course be increased, and the sooner will the deficiency in the depth be felt.

The low dam or walling plan of improvement, though the opposite in its effect to the one described, and not so radically erroneous on the general principles, in no less so in its application to such a river as the Potowmac. To make this manifest, some detail of the circumstances in which they are used and placed is necessary. The ruins of this kind of work, are for some distance above Cumberland, but do not,

however, reach the Savage river, and extend at greater or less intervals to where the general depth of the water is considerably increased, becoming more and more rare as the water is more abundant. They consist in low dams running across from shore to shore, elevated about 18 inches or two feet from the bottom, and made of rounded stones picked up out of the bed of the river, of a size that a man can conveniently handle, the greater part not larger than a man's head, and raised on a broad basis of from ten to twenty feet in width. This transverse low wall or dam is usually connected with two walls about the same height, but built on a narrower basis of from six to eight feet placed parallel to each others, and to the shores at the distance of 20 feet from each other; through which passage by a gap in the transverse dam, it is intended to force the current of the river, and to deepen the water by collecting it into this artificial channel.

The number of these transverse walls connected, as stated with 20 feet sluices on the river, is very great, but it was not thought necessary to correct them. Indeed, in such a state of ruin were the greater part of them found, that they were difficult to distinguish from the numerous fish dams found along the whole course of the river. A few, but not enough of them, were in a sufficient state of preservation, to be examined, and to afford the means of ascertaining how far they were calculated to answer the ends intended.

The commissioners are not prepared to say, what might be the effect of this kind of walling on other rivers; but they are well assured, that the river Potowmac cannot be usefully confined, by such contrivances, even if they were made in the best manner, of which that kind of walling is susceptible. The bottom of this river, which forms the drain of a mountainous regions of such wide extent, is very unequal in its level, and abounds in shallows and basins according to its obduracy or softness, and to the increased or diminished force of the current, sometimes weakened by expanding in widening plains, or in the formation of islands; sometimes increased by contraction between mountains and rocky banks, and above all, by its flowing so rapidly in consequence of the greatness of *its depth* compared to its length. The result from such circumstances on this kind of work, situated in the bed of such a river, is that these walls cannot be made sufficiently permanent; and if they could, so very many or them would be required, to attain even a trifling depth, that the benefit would be infinitely too dear, or an absolute waste of money. These walls, from their nature, cannot be tight; but if they could be made so, and the whole body of the water in such a river could be confined to channel of 20 feet, the velocity of the current rushing through these short channels, with full room to spread after it has passed, would be increased in proportion to its confinement. And the whole volume of water in the river, in the summer and dry seasons, especially above the south branch, would not be sufficient to give the depth required by boats of sufficient size to be useful in transportation, where the quantity of water in this river is much increased by the large tributaries in order to give 18 inches depth, and less would be of no use. It would be necessary to continue the parallel walls, much further than they have ever yet been attempted, so as to give them a length sufficient to reach over the whole extent of continued shallows, which were found, in places, to cover 3 or 4 miles. The effect of lengthening the sluice walls, would be in some measure to lessen the velocity, and of course to increase the depth of the current; but the evils are much too great to be usefully remedied by the small effects which could be produced by these means, if it were practicable to give duration to walls, so built and so placed. Walls of this kind, when drawn so long, and winding and bending as would be necessary to follow the course of the current, would be objectionable for other reasons independent of the increased liability to destruction, such as the extreme difficulty of guiding a boat with sufficient accuracy in these narrow confined torrents, so as to prevent her striking and bilging against or over the side walls in descending, * and the fact that in ascending them, her progress would be so much retarded, by the increased force of the current consequent on its confinement. For, on the supposition of a large proportion of the distance being so confined, many wrecks {the Md. & U.S. Congress versions say “weeks”} would be added to the length of time consumed in a trip to and from market, already inconveniently long, and in some places capsons {capstans} would be required to be placed on the banks, to overcome the opposing power of the current. For these reasons, and from the experience already had of the perishable nature and trifling utility of this sort of work, it appears that it would be idle to attempt any thing in future of this kind.

* NOTE: The greater part of the wrecks which of late years have occurred, according to information received along the river, were in consequence of the boats being dashed against the sluice walls.

[Appendix] D {C}

The JOURNAL of the commissioners appointed by the states of Maryland and Virginia, to view the river Potowmac, and report the state of its navigation, and how far the Potowmac company had complied with their charter; taken from day to day as they descended the river, noting the depth of waters, and condition of its channel.

The notes made previous to the day noted below were mislaid.

August 6th 1822—6 miles above Old Town, measured the depth of the river in the sluice made over the ripple, immediately over Sap's run, which is above the Slate Bluff at Wary's, depth 18 inches. At the next ripple above Jacob's island, on which we grounded, the best water was 4 inches deep only. About 100 yards down the island, on the right hand channel, a ripple of large stone, on which we frequently touched bottom in a boat drawing only seven inches water.

Just below Jacob's island, touched in the best water.

In the space of a half mile, grounded again.

August 7th—Left Cresap's landing; opposite to this, the boats stuck fast in about 5 inches water in the best channel; passing Allam mill [Allum Hill at Oldtown?], the boats rubbed the bottom for a few yards, on a depth of about 6 inches; and between the walls made by the Potowmac company for a sluice, the boats stuck fast.

From this point to Union Taylor's island, the water is at least 18 inches deep.

Opposite to Lanby's mill, boats stuck fast in 4 inches water: Opposite to Old Town, the boats stuck fast again in 4 and a half inches water, taking the best channel.

At the head of a canal, and running through the length of it, water 9 and a half inches deep.

[The Md. & U.S. Congress versions begin here, falsely implying that the survey began on August 8th at the South Branch.]

August 8th—Moved from the confluence of the North and South branches of the Potowmac; good water for a short distance to Old Town Falls; here, for upwards of 200 yards long, the water in the best channel from 7 to 5 inches deep; channel very narrow and crooked; then good water for a short distance; then shoal for 50 yards, affording only six inches water; then good water for a short distance; then entering a long shoal above Taylors', and extending to the mouth of Town Creek; through the whole length of which, the boats rubbed, and were dragged by men, in water not more than 5 inches deep.

At the mouth of Town creek, there is a wing dam, and sluice {chute}; not more than six inches water in the sluice; deep water to Malcomb's island, but the navigation difficult, through scattered rocks; then commences a shoal on which the boats rubbed, and passed with difficulty through a wing dam and narrow sluice; then better water 12 to 15 inches to O'Neil's bottom; here, the boats moored for the night.

August 9th—Moved on through good water past Malcomb's Island, and mouth of Little Capon, on the Virginia side, to Coxes' falls; then passed an island, along which are three rapids, extending upwards of a mile; the boat rubbed the whole way, except about 100 yards between each rapid, where the water was from 2 to 3 feet deep, with rocks standing above its surface a part of the way. Below this, the water is good for a mile, when we arrived at a rapid called the Devil's Nose, above Col. Greenwell's House. At the rapid, are wing dams, and a narrow and sluice of difficult navigation; then good water for 100 yards to Greenwell's ripples, 100 yards in length, where the boats rubbed; then better water to a reef of rocks crossing the river, leaving a narrow channel; then good water to John Mitchell's bottom, except a reef of

rocks, where there is a small fall; then good water from 5 to 20 feet deep, opposite to McDonald's on Virginia side; then water good for ½ mile to Mitchell's rapids, half a mile long, on which are six reefs across the river, making a narrow, crooked, and very difficult channel.

Stopped at Boxwell's for the night.

August 10th—Moved from Boxwells, for 200 yards good water; then encountered small falls or ledges of rocks quite across the river; 300 yards, the water from 3 to 8 inches deep; good water for ¼ mile; then for the next mile several ripples; water 4 inches, along, or over which, the boats were dragged.

Between the ripples, the water is good; came to Swede's Falls ½ mile in extent, the boats frequently rubbing and passing with difficulty.

August 12th—Moved from McAtus's {N. Abel's} ripples where for some distance, above and below, there are large rocks standing two or three feet above the surface of the water, and so numerous that the passage between them is very intricate, making it necessary to cross and re-cross from shore to shore; sometimes hanging upon the ripples where there was not more than 4 inches of water: These ripples continued a considerable distance, the boatmen having frequently to get out and lift and drag the boats. Immediately above the Tumbling dam falls, there is a shallow bar affording only 4 inches water. Among these falls, there is one of a perpendicular pitch of apparently 18 inches, and exactly in the boat channel. Beside these natural obstructions, there are here, and at many other places, artificial ones, made by building fish dams in the river, in shameful violation of law. Below the Bear falls, the boat hung and rubbed for a long distance in water not more than from three to four inches deep, and before she could pass, the boatmen were under the necessity of going into the water, and clearing the channel, by throwing out the stones. Good water one half mile with some short interruptions; afterwards, came to another long ripple where the boat hung for a long time, notwithstanding all the exertions of the men, the water more than 3 inches deep.

August 13th—started from Neal's. Commissioners' boat supposed to draw about 7 inches water, good water for a short distance, then grounded on a ledge of rocks, running across the bed of the river; 200 yards lower down, ledges occur again for several hundred yards, on which we occasionally rubbed without stopping; further on, grounded on small gravel, the men had to drag the boat near 50 yards, water varying from 8, 10 to 12 inches deep; for 50 yards farther, water very little deeper, when the boat had again to be dragged; passed great numbers of shallows this day, of from 5 to 6 inches in depth, among which was a fish dam firmly cemented with mud; for a 100 yards, good water, then frequently rubbed and twice stopped on a large stone which covered the bed of the river; good water for 2 or 300 yards, river filled with scattered stones rising 12 or 18 inches above water; then water good for a short distance; then our course was interrupted by a fish dam and broken sluice, the boatmen obliged to throw stones out of the way; farther down, grounded on stone abounding here in the bed of the river; nearly abreast of Mr. Tidball's house, a reef crosses the river and causes a small fall 5 or 6 inches, over which we passed without difficulty; a reef with a similar fall just below the above, obliged the boatmen to shove and lift the boat over; farther down, passed another reef on which we touched; a sluice made through it, misplaced and not used; then reached a gradual fall on which grounded and passed with difficulty, having to clear a passage; then a few yards of deep water; then rubbed for many yards; again a space of good water; then grounded on large gravel; dragged some distance; then floated a little; then dragged again 20 yards, into a few yards passable water; then dragged again into water which continued good for near half a mile; then rubbed again on small gravel; floated a little; then rubbed on large gravel, and soon stopped on a rapid; about 100 yards above Lantz's house and island, dragged over with difficulty; then good water to Lantz's, where we stopped for the night.

Wednesday Morning, August 14th—Moved from Lantz's, on shoal water; boat rubbed frequently, and with difficulty passed the small opening in ledges of rock across the river; these openings lying in zigzag line, render them very difficult of access; the boats rub hard at most of the passes; these cliffs and shoals

extend upwards of a mile around the head of Washington's Bottom; then good water half a mile; then ledges of rocks rising to the surface in three feet water, with narrow shoal passes, rendering the navigation difficult, and extending upwards of half a mile; then shoal water from shore to shore about three quarters of a mile past Dimmits Island; at one place boats could not pass until stones were removed, to make a small channel; the impediments through this shoal can only be overcome by swelling the water by dam; then good water three quarters of a mile to O. Queen's; then shoal water; boats rub, and are dragged a mile; then good water to the Burnt Mill falls; here is a wing dam 12 or 15 inches high, turning the water to the Maryland shore, working a small grist mill, owned by Thomas King; fall at the mill, 3½ feet: a rapid shoal extends near 200 yards from the upper end of the wing dam, and ends nearly opposite the mill; then good water 200 yards to a point opposite to Marshall's house, on the Virginia shore, where the boats moor for the night.

Thursday Morning, August 15th—Moved from Marshall's; good water continued half a mile to a ripple below the mouth of Fifteen Mile Creek; at this ripple, ¾ of the width of the river, is here 150 yards distance, leaving a narrow, crooked, and shallow channel, through which the boats rub; then good water about 100 yards; then a ripple 100 yards, through which the boats rub nearly the whole way; then the water deepens to three feet, with scattered rocks, near the surface, a quarter mile; then a ripple, a wing dam, and a shoal {"shute"} very shallow; then good water 100 yards; then appear ledges of rocks across the river, six in number, about equal distance from each other, and extending 150 yards down the river; boats rub through the narrow passes on these ledges. Then, good water by the Man-of-War Rock, opposite Matthew Engle's; then a short reach of good water, to Willet's Falls, or long canal; through these Falls the boats were dragged with great difficulty; after passing them, enter on water with ledges of rocks across the river; there, and below where shoal water extends across the river a considerable distance, passing Sidling Hill creek, and to Ferree's, no loaded boat drawing eight inches water could pass. The boats moored opposite Ferree's for the night.

Friday, August 16th—Shoal and difficult water by ledges of rocks and ripples; passed Big Capon, and to the upper end of Ridout's bottom; then good water 100 yards; then shoals and ledges of rocks, boats passing through narrow and crooked openings, one among rocks four feet above water; the only pass very narrow and close to the Virginia shore; then variable water {the Md. & US Congress versions mention here "John Roby's" and "Leopard's Mill worked by the river water, under a fall of three feet and a half"}, the greater part shoal, to the mouth of Little Branch, below Mr. Summer's.

August 17th—Moved from nearly opposite Mr. Summer's, living on the Maryland side, and 5 and a half miles above Hancock; good water a short distance; then passed a reef of rocks with a fall of near 3 feet, extending quite across the river, and about 50 yards in width, the boat rubbing part of the way, and dragged about 10 yards by the men, the water from 5 to 10 inches; then 1 and a half miles of water from 20 inches to 3 feet; then 150 yards of ripple, the water upwards of 12 inches, but the large stones arising above the surface so numerous as to render it very difficult for the boat to pass along; then a half or three quarters of a mile of good water; then a ripple one quarter of a mile in length above Round Hill, water from 6 to 12 inches, good water a short distance; then another ripple through a canal below Round Hill, water about 7 inches, except through the shute of the canal, where the boat grounded: then good water to Hancock, with the exception of two ripples about a mile above the mouth of Little Tonoloway, the one 50, the other 30 yards long, the water from 6 to 10 inches deep; the boat rubbed part of the way, and twice grounded; moored at the mouth of Little Tonoloway.

August 18th, Sunday, 19th, 20th and 21st—lay at the mouth of Little Tonoloway, whilst the levellers went back to Cape Capon to survey the route from thence to Hancock, on the Virginia shore.

August 22^d—Set off with the boats from the mouth of [Little] Tonoloway, a few perches of good water at first, then three ledges of slate rock across the river, two opposite Hancock, and one just below,

on all which we rubbed; between them a few perches good water; then good water to the lower end of Donovan Island, where another ridge crosses, at which there is a fish dam, and fall of 9 or 10 inches, and difficult crossing, good water opposite the mouth of the Warm Spring Run, (Bath,) a little good water; then a shoal, and reef, slate and gravel; grounded; then good water, touched another reef, passable water 50 yards; then large stones so close as to prevent passing without rubbing; then grounded in 9 inches water on a shoal and fish dam, 8 inches water; stone too close to allow an uninterrupted passage, some passable water to the upper end of Yate's island; then grounding, rubbing, and touching abreast of the island; Big Tonoloway enters just above this island; for half a mile bad water, 5 or 6 inches only; bad water, and two more ledges of slate with 5 inches water on them above widow Rowe's or Bevin's island; tolerable water abreast of Island for 300 yards.

August 23^d—Moved from opposite doctor Jacques' house [Dr. Lancelot Jacques settled at Millstone Point, Md., opposite Sleepy Creek] , where the canal crosses from Virginia to Maryland, good water for 150 yards; then shoal begins opposite Jacques' island; water from 5 to 8 inches, boats rubbed for 80 yards, and then grounded, and hands had to open a channel by removing the gravel and stones; not 3 inches water; boats lifted over with hand-spikes; after this, water deepens to about 10 inches or a foot, filled with large loose stones, which impeded the navigation, and caused the boats twice to get fast; good water begins below fish dam, opposite lower end of Jacques' island, and continues to about 100 yards below upper point of Miller's Island, about half a mile, where begins a shoal at a fish dam, where hands had to make a channel by removing stones, &c, for 20 yards, water at 4 to 6 inches; then increases to nine, but interrupted by stones and rocks for about 50 yards; then shoal from 10 to 4 inches, for distance to Licking, say one and a half mile; men out again. and making channel between upper and lower point of Miller's island, and repeatedly aground on ledges between this island and Licking; moored at mouth of Licking.

August 24th—Moved from mouth of Licking; good water for 100 yards, to a fish dam; then rapid, and full of big rocks; boat fast, from 6 to 8 inches; water then good for 150 yards to another dam, below which is a rapid of short continuance; then water sufficiently deep, but bed very rocky for 80 yards; boat rubbing on the rocks; here a line of large rocks reaches nearly across the river; boats fast among them; deep water from this for 50 yards; then shoal, and boats fast upon a bed of large stone; then rocky bottom, but good water for 80 yards, to a fish dam; boat occasionally touching on the large stones; several ledges here across the river upon one of which boat got fast; below this, deep water with slate ledges, upon which boat repeatedly got fast; this kind of water and bed continues for one and a half miles; in this distance, a bed of moss, across the river extends for half a mile; good water through it, but full of rocks.

This water extends to the Elm spring, on Md. side; a shoal then begins, and continues for upwards of half a mile; boats fast, and lifted over with great labour; men obliged to open a channel, by removing stone, &c.. This shoal extends to Cherry run, on Va. side, with the exception of about fifty yards, just above fish dam; below which, is a rapid for a few yards, and then good water for 1½ miles to head of Johnson's falls, nearly opposite Back creek, on Va. side, where we moored for the night.

Sunday, 25th—The boats lay to, and the party rested.

Monday morning, August 26th—Moved from Johnson's falls; shoal water to Garrison's Falls, one and a half mile; here are high ledges of rocks extending across the river, and only one narrow pass for boats [this pass was likely "Beall's Canal"]; then good water, the Fiddle Strings, so called from four ledges of rocks near each other, appearing above water, extending across the river; the boats passed the ripple with great difficulty, there being no passage affording sufficient water, the boats were lifted and dragged over by doubling the crews, and were more than an hour in moving less than 100 yards; then good water to Claycomb's ripples; then shoal, from shore to shore, to Pott's spring; boats rubbing; then good water to Prather's saw mill, made by his mill dam; then shoal ¼ mile; whole distance from the Fiddle Strings, four and a quarter miles, to Prather's, where the boats moor for the night.

Friday, August 27th—Moved from Prather's on good water, passing Charles's mill at the mouth of the Big spring run, half a mile good water, continues to Barkman's fish dam raised in a shoal part of the river extending a quarter of a mile; here the boats passed with great difficulty, being dragged and forced over the shoals by doubling the crews in several places, and by making little channels, by moving stones, in the way.

The water is then better for small distance, say a quarter of a mile, which reaches another shoal called Tryal fish dam, a very appropriate name, as it sufficiently tried the strength and skill of the men, in lifting and dragging; the boats rubbing the whole distance of two hundred yards and upwards; the water then became deeper for a short distance; then very shoal to Middlecalf island and some distance along it: the water then good to the mouth of Little Conogocheague at Middlecalf; then becomes shoal passing two islands known by the name of Buzzard islands, and then on passing Hawk's Island; the whole of this distance the water very shoal, the boats were got over with great difficulty, and by doubling crews, one mile and a half, the water becomes then deeper; the boats after passing a quarter of a mile, put in for the night.

August 28th—Left the upper end of a high ridge of rocks on the Va. shore, above {about} 5½ miles above Williamsport; for two miles, the water 8 or 10 feet, the boatmen using their oars the whole distance. The next mile the water varying from 4 feet to 18 inches; then a mile of about one foot water; moored for the night about 1½ miles, above Williamsport.

August 29th—Left the station 1½ miles above Williamsport, the river being wider than at any place above, the boats rubbed on the ground {gravel} a great part of the way, to Williamsport, where we were detained 4 hours, by the hands going on shore from {. From} Williamsport to the place called Falling Water{s} on the Va. side; the boats often stuck fast, and were only got along, by lifting and dragging them, by main force.

August 30th—Started from the Falling Waters; water good; velocity of the current diminishing; general depth increasing, and the navigation less frequently interrupted by reefs and shallows; in the space to Hadley's Rock, about 2½ miles, a fish dam on a gravel bank, and two ledges of limestone, rising near the surface, are the only difficulties, but were passed with a rub; the bed of the river for the above space, is uniformly limestone rock; opposite Lefebre's house, it rises and forms the bank of the river on Va. side, for 50 yards; at Hadley's, the rock displays itself on the shore for more than a quarter of a mile on the Md. side. A fish dam and ripple on which we grounded just below Hadley's; then good water till we passed the mouth of Opecon, when we grounded on Opecon ripple, where there is another fish dam and water about 9 inches deep; then a little good water; then grounded again on Opecon ripple; moved on a little; then rubbed hard again, then better water for ¾ of a mile above Opecon; rocky shore on the Md. side; just below, the rocks approach the shore on the Va. side, and continues for 1¼ miles; another fish dam obstructs the navigation on Opecon ripple; and then three narrow reefs of limestone rock; below, this last dam across the river on which there is not more than 6 or 7 inches water; then deep water to Spring's {Sprigg's} mill, where we stopped for the night. Considerable fall in the water in the space occupied by Opecon ripple; here Boyd went home for a day, and party rested on Saturday and Sunday.

September 2d—Started from New-Comer's; good water for a mile and a half; cliffs on Md. side for a greater {quarter} part of the way; a ledge of limestone extends nearly across the river, just below Galloways's mill, but does not interrupt the navigation; water very deep, out of the reach of the pole; water good to Mill's {Millet's} spring, except about two hundred yards of shoal water.

September 3d—Left Mill's {Millet's} spring; good water for three quarters of a mile; then pass a fish dam; then good water for half a mile; then another fish dam; good water, but interrupted by big rocks and ledges; ripple {Hog river ripples} continues about a mile; wing dam made by Potowmac company about

mid-way; then ripples; boat fast on a ledge of rocks in 5 inches water; good water for a mile; then fast on a bed of rocks at Zuck's fish dam; water variable; passing three fish-dams to the head of Ground's ripple, two miles. Boats moored at Spong's landing for the night.

September 4th—Moved from Ground's ripples; shoal water a short distance; boats rub at one place on a ledge of rocks; the navigation interrupted by ledges of rocks, ranging with the current, where is a fall of three or four feet, in a quarter mile; narrow passes through those ledges, then good water to Chaplain's; then shoal a short distance; then good water to Shepherdstown.

Thursday, September 5th—Moved from Shepherdstown, on good water, half a mile; then shoal from shore to shore; ledges of rock, with few passes for boats; very difficult navigation; the channel shoal and winding; boats rub, and are dragged, in many places, through this shoal, which extends a mile and a half; then good water to the Anticlam {Antietam} forge ripples; a narrow ledge of rocks across the river, with but one shallow and narrow pass; the fall in this ledge about a foot; then good water to Coon's, where the boats put in for the night.

Friday, September 6th—Set off from Coon's, two miles below the Anticlam {Antietam} iron works with a fine sheet of deep water; $\frac{1}{4}$ mile below this, river bends suddenly to the west; is wide, and too deep for poling. At Reynold's mill, river bends to the south; at the bend, a rocky island on the Md. side, and rocky shore on the Va. side; water deep to the end of the island, where a ledge of limestone crosses the river obliquely; here we enter the Cow Ring sluice, on the Va. side. This sluice is formed in the most approved manner, by the assistance of nature, and a ledge of rocks so situated as to throw the collected water of the river into the sluice. With this advantage, the greatest that can be obtained by wing dams, you have the increased rapidity of the current to surmount, which is so great as to require a capson [capstan], which is placed at the head of the sluice, by which a boat is drawn up slowly, and with much labor. The force of the current is, moreover, so great, as to dislodge the stones on the walls, and even large ones, flat and well placed; so that sluice navigation, under the most favorable circumstances, is a miserable shift.

Below this sluice, water deep, little current; river bends to the south; $1\frac{3}{4}$ miles below the sluice is an extensive hill, on the Va. side, coloured with the oxide of iron; in it, a considerable excavation for ore. This bank furnishes ore to the Anticlam {Antietam} works; ore said to require mixing. Below the sluice, water deep; river bends S. W.; in the bend, cleft [cliff?] of rocks approaches to the shore, opposite Keep Trice's [Keep Triste] old furnace; a large ore bank on the Md. side, and the Virginia banks shew signs of ore. Below the furnace, Va. Side, high rocky shore. The river without obstacle, until you reach the head of the Canal (as it is called) on the Md. side, which we found closed by a dam 2 feet high, made to enable the public works to continue in operation during the extreme lowness of the water at this season.

To surmount this obstacle, by agreement with the superintendent at Harpers Ferry, (Mr. Stubblefield), we passed over to the canal race of the public works, and had our boats drawn out on a carriage into the river, near the ferry, crossing without any interruption of our work. At the head of the long canal, (so called,) a rapid commences, and the bed of the river is uniformly covered with fixed rock and huge stones, projecting three and four feet above the present level of the river; presenting an aspect, terrific to the beholder, and dangerous to the navigator. This appearance and state of the river, continues to the ferry, a distance on the Md. side, of about two miles; the fall in that space, ascertained to be 27 feet. To improve the navigation through the rapid, the Potowmac Company have constructed, at great expense, partial channels on the Md. Side, 3 in number. The first with a tolerable level bottom, clear course, 18 or 20 feet wide; and the two others, with very unequal bottoms, and irregular courses, affording an imperfect and dangerous navigation in high water. Along the whole course of these rough passage ways, a broad wall, at the foot of the rocky mountain, which here binds the river, is used for a tow path; along which, boats are dragged up. The boat stopped this night at the head of the long canal; and, next morning, the boats were hauled over into the river.

Appendix II – Potomac Navigation as Described in the Joint Commissioners' Report

September 7th—Started from Harper's ferry, and ran through the spout, which is extremely rapid and rocky for a distance of three hundred yards, or more, making a very crooked passage among dangerous rocks, and must be a most hazardous navigation at any time, and cannot be improved, but at an expense which would make a good independent canal for the same distance. For the last three miles, and apparently for some miles ahead, it would astonish the beholder at low water, to be told, that the river could be navigated at any time, so numerous, so large, and so prominent are the rocks covering the whole bed of the river; the imperfect channel, called a canal, made by the Potowmac Company, being at this time entirely dry.

In the run this day, but especially through that part of the river called the spout, our boats struck very hard against many of the rocks; and had not our boats been very tight, they must have been wrecked; the boats put in opposite Mr. Weaver's meadow for the night.

September 8th—Being Sunday, boats lay until Monday, Sept. 9th; then removed; passed the mouth of Pleasant Valley, at Weaver's mill, on rough and shoal water, amidst rocks from three to six feet high, from shore to shore, the passes between the rocks very narrow and irregular, making it necessary to traverse the river from side to side, to gain the passes; this rugged bed in the river continues above a mile, with considerable fall at different places, one called the Devil's Elbow, at Payne's Falls, opposite Payne's island, between which and the Md. Shore, is wall work made by the Potowmac Company, as a canal {channel} for boats; but which channel is now dry; below this, enter Dever's mill dam, formed of brush and stone, obliquely in the river, to throw the water to the Md. shore; this dam is much complained of by boatmen navigating the river, and was found to prevent our boats from passing through the best channel, and turned them at a right angle to the middle of the river; the boats rubbed frequently on the narrow passes between the rocks, which continued with less fall in the river, to Philpott's or Payne's ripple, a mile and a half; here, we were clear of the South mountain; a rocky shore on the Va. side from Harper's Ferry; the water variable, interspersed with rocks and shoal to Berlin, and a mile below it; the boats put in for the night.

Tuesday, September 10th—Wm. Naylor, Jr. [this was likely Naylor's son, William Sanford Naylor] employed to take meanders of the river, brought on that work from Cumberland to a stake in Casper W. Weaver's meadow, which he reached on the evening of Saturday, the 7th instant, and declining, from indisposition to progress any further with that work, it became necessary to employ another surveyor in his place; Corbin West, engaged in that service this morning, and the boats proceeded on water, varying in depth mostly shoal through scattered rocks, and over ripples, often rubbing, and with difficulty getting through the narrow passes or ledges of rock; in fine, it may be truly said, that from the head of the Long canal above Harper's ferry, to Sonders' Ripple and Luckett's Ferry, above twelve miles, no navigation is afforded for boats of any burthen, in low water, nor can it be deemed either good or safe, in the best state of the water, from the great number of rocks which crowd the river a great part of the way, and are seen from three to ten feet above the surface of low water; from Luckett's ferry to the head of Hook's falls, good water half a mile; then shoal and rocky through these falls, where the river passes the break in the Katockon mountain; 1½ miles are more rocks and difficult navigation; then good water passing Jenkins' [Paton's] island, to a fish dam; then shoal water; boats rub and pass two other fish dams, in very shoal water, to the Kanawa spring, opposite Kemp's [Conoy or Heater's] island, where the boats put to for the night.

September 11—Remained at Kanawa spring opposite Kemp's [Conoy or Heater's] island until after dinner, waiting for the engineer to come down with his work: started about 2 o'clock and reached Noland's ferry, a distance of about three and a half miles, where we moored for the night. The first two and a half miles good water, from 2 to 4 feet; the last mile shoaly, the water from 10 to 16 inches, along which we were enabled to keep our boats afloat, only by frequent windings.

Appendix II – Potomac Navigation as Described in the Joint Commissioners' Report

September 12—Started from Noland's ferry, water good for one half a mile; then shoal, being about 10 inches; this water continues for about 150 yards to an old fish dam, just below which boats got fast; this shoal continues for at least one half of a mile; boat occasionally rubbing, and once more fast; then good water to Monocacy, at the mouth of which one of the boats got fast; thence good water to Holm's ferry; thence to Douglass's red rock, generally good water; the boat, however, scraped once or twice; water very shoal, and boat fast at head of Clapham's [Lower Mason] island; shoal water during the whole length of this island.

[The body of the report notes that the survey was forced to end about half a mile below Goose Creek, "occasioned by the serious sickness of the greater part of the commissioners, and of the engineer and surveyors."]

Appendix III – Descriptions of the Potomac Company’s Major Works

Descriptions of the Little Falls Canal and Locks (along Maryland and D.C. shore)

	Gilpin 1789^a	Pot. Co. 1808^b	Peter 1816^c	Mason 1817^d	D.C. 1822^e	Briggs 1823^f	Stewart 1826^g
Canal							
difference of level	37 ft 1 in	37½ ft	37 ft 1 in	37 ft	37 ft 6 in	37 ft	37 ft 1 in
total length	2¾ mi	3,814 yd ^h	3,814 yd	3,814 yd		2½ mi	2½ mi
depth		6 ft		6 ft	6 ft		4 ft
width-top		25 ft		25 ft	25 ft		25 ft
width - bottom		20 ft		20 ft	20 ft		20 ft
Locks							
number ⁱ		3	3	4	4		4
lock seat material		wood			masonry and stone		stone
length (each)		100 ft			90 ft		80 ft
Width		18 ft			12 ft		12 ft
lift (each)		11 ft					
volume (each)		23,400 cubic ft					

Notes:

a. Potomac survey by Col. George Gilpin and James Smith, 1789 (House of Representatives Report 111 of 17th Congress, 1st Session, 28)

b. Response of the Potomac Company to inquiries by the secretary of U.S. treasury, Albert Gallatin, January 20, 1808 (Potomac Company records and Bacon-Foster App. C)

c. Letter from M. Peter to the Senate and House of Delegates of the Commonwealth of Virginia, late-1816 (?) (Potomac Company records).

d. Letter from John Mason to Bernard Peyton, secretary of the Va. BPW, December 9, 1817 (Va. BPW annual report, draft in Potomac Company records and Bacon-Foster App. D)

e. Report of the Committee of the District of Columbia, May 3, 1822 (House of Representatives Rep. No. 111 for the 17th Congress, 1st Session, pages 14–17)

f. Isaac Briggs’ *Report on the Potowmac*, January 23, 1823 (Eighth Annual Report of Va. BPW, 14–17)

g. Andrew Stewart’s *Brief Description of the Works Executed by the Potomac Company*, May 22, 1826 (House of Representatives Report 228 for the 19th Congress, 1st Session, 62–63. Report repeated verbatim in accounts by C.F. Mercer in House of Representatives Report 90 for the 19th Congress, 2nd Session, 30–31, and in House of Representatives Report 47 for the 20th Congress, 1st Session, 45–46.)

h. 3,814 yards = 2.167 miles, or slightly greater than 2 1/8 miles.

i. Potomac Company documents dated July 2, 1799, and December 3, 1801, also specifically note there were three (wooden) locks then. The 1817 report is most likely referring to the new stone masonry locks, which began operation on March 2, 1818. Thomas Harbaugh’s 1833 accounts reproduced a February 3, 1814, Potomac Company document recommending Harbaugh to build new lock gates for the four new locks at Little Falls.

Descriptions of the Great Falls Works – Part 1: Basin, Channels and Locks

	Pot. Co. 1808^a	D.C. 1822^b	Stewart 1826^c	Harbaugh 1833^d	Hahn 1976^e	NPS 1986^f
Holding Basin	No mention of basin	mentions “bason”	mentions: “A set of guard gates and an extensive basin”			2,400 ft long, 210 ft max width, 10 ft. deep in center
Headgate channel				390 ft long, 25 ft wide, 6 ft deep	14 ft wide	14 ft wide
Lock 1—length, width & lift	100, 14 & 10 ft	100, 14 & 10 ft	locks - each length 100 ft, width from 10 to 14 ft, lift from 10 to 18 ft	112, 15 & 9 ft	101, 14 & 10 ft	101, 14 & 10 ft
Channel between Locks 1 & 2				400 ft long, 30 ft wide, 5 ft deep	“Lock 2 is located 500 ft below Lock 1”	
Lock 2—length, width & lift	100, 12 & 16 ft	100, 12 & 16 ft	(same general description as above)	97, 12 & 15 ft	88 ft 7 in, 12 and 15 ft	gates 88 ft 7 in apart
Channel between Locks 2 & 3				97 ft long, 20 ft wide, 6 ft deep	“100 ft or so” between locks	“a little over 100 ft” between locks
Lock 3—length, width & lift	100, 12 & 14 ft	100, 12 & 14 ft	(same general description as above)	100, 12 & 11 ft	111, 12 (at lower gate) & 14 ft	gates 111 feet apart
Lock 4—length, width & lift	100, 12 & 18 ft	100, 12 & 18 ft	(same general description as above)	95, 12 & 18 ft	gates 94 ft apart, 18 ft lift	gates 94 ft apart
Lock 5—length, width & lift	100, 12 & 18 ft	100, 12 & 18 ft	(same general description as above)	84, 12 & 20 ft	gates 94 ft apart, 19 or 20 ft lift	gates 94 ft apart, 20 ft lift
Lock 1—volume	18,200 cubic ft.	18,200 cubic ft.	“from 18,000 to 25,000” cubic feet			
Lock 2—volume	22,800 cubic ft.	22,800 cubic ft.	(same as above)			
Lock 3—volume	20,400 cubic ft.	20,400 cubic ft.	(same as above)		irregular shape	irregular shape
Lock 4 volume	25,200 cubic ft.	25,200 cubic ft.	(same as above)			
Lock 5 volume	25,200 cubic ft.	25,200 cubic ft.	(same as above)			
Material—Locks 1–3		Hewn free stone	Solid masonry of stone	Lock 2 of “red free stone,” Lock 3 “bottom of solid rock”	Locks 1 & 2 of red Seneca sandstone and freestone	Lock 1—red Seneca sandstone and freestone & other stone
Material—Locks 4 & 5		“blown out of solid rock... some mason work”	Excavated from solid rock	sides and bottom of solid rock	solid rock	

Descriptions of Great Falls Works – Part 2: General Canal Description

	Pot. Co. 1808 ^a	D.C. 1822 ^b	Stewart 1826 ^c	Harbaugh 1833 ^d	Hahn 1976 ^e	NPS 1986 ^f
Difference of level ^g	76 ft 9 in	76 ft 9 in	76 ft 9 in	73 ft from basin to lowest lock		
Total length	1200 yd	1200 yd	1200 yd			
Canal depth	6 ft	6 ft	4 ft		“sources state in general 2 ft, except 4 ft between locks”	6 ft
Canal width top	25 ft	25 ft	25 ft		“generally 25 ft”	30 ft
Canal width bottom	20 ft	20 ft	20 ft		“generally 20 ft”	20 ft

Notes:

a. Response of the Potomac Company to inquiries by the secretary of the U.S. treasury Albert Gallatin, January 20, 1808 (Potomac Company records and Bacon-Foster App. C). John Mason gave an identical description of the canal (but none for the locks) in a December 9, 1817 letter to Bernard Peyton, secretary of the Va. BPW (Va. BPW annual report, draft in Potomac Company records and Bacon-Foster Appendix D)

b. Report of the Committee of the District of Columbia, May 3, 1822 (House of Representatives Rep. No. 111 for the 17th Congress, 1st Session, pages 14–17)

c. Andrew Stewart’s *Brief Description of the Works Executed by the Potomac Company*, May 22, 1826 (House of Representatives Report 228 for the 19th Congress, 1st Session, 62–63. Report repeated verbatim in accounts by C.F. Mercer in House of Representatives Report 90 for the 19th Congress, 2nd Session, 30–31, and in House of Representatives Report 47 for the 20th Congress, 1st Session, 45–46.)

d. *A Journal of the Accounts &c, Thomas Harbaugh, with the Potomac Company, and Other, from 1803 to 1833*, 1833. Harbaugh counted the headgate channel as a lock, so his lock numbering is different. Harbaugh’s document also gives detail descriptions of interconnecting channels and lock hardware.

e. Thomas Hahn’s *George Washington’s Canal—At Great Falls, Virginia*, Shepherdstown W.Va., American Canal and Transportation Center, 1976.

f. National Park Service’s *George Washington Memorial Parkway Historic Structures Report—Potowmack Canal and Locks, Great Falls Section, Great Falls, Virginia*, December 1986. This NPS work adapted information from: 1) Joseph Prentice and Thomas Hahn’s draft *Potowmack Canal Study*, 1973, 2) historic information compiled by Ricardo Torres-Reyes in his *Potowmack Company Canal and Locks, Historic Structures Report, Great Falls, Virginia* (National Park Service, 1970), and 3) archeological work done in 1977.

g. Potomac survey by Col. George Gilpin and James Smith, 1789 (House of Representatives Report 111 of 17th Congress, 1st Session, 28) also measured the total fall as 76 ft 9 in.

Descriptions of the Seneca Canal (along Virginia shore)

	Pot. Co. 1808^a	Mason 1817^b	D.C. 1822^c	Stewart 1826^d
Difference of level	7 ft	7 ft	7 ft	
Total length	1320 yd	1320 yd	1320 yd	
Depth	“other canals 4 to 5 ft deep”	Sluices at House, Shenandoah & Seneca Falls “4 to 5 ft deep”	“other canals 4 to 5 ft deep”	
Width	“other canals 16 to 20 ft wide”	Sluices at House, Shenandoah & Seneca Falls “16 to 20 ft wide”	“other canals 16 to 20 ft wide”	Other works “widths varying from 16 to 25 feet”

Notes:

- a. Response of the Potomac Company to inquiries by the secretary of the U.S. treasury Albert Gallatin, January 20, 1808 (Potomac Company records and Bacon-Foster Appendix C)
- b. Letter from John Mason to Bernard Peyton, secretary of the Va. BPW, December 9 (or 6), 1817 (Va. BPW annual report, draft in Potomac Company records and Bacon-Foster Appendix D)
- c. Report of the Committee of the District of Columbia, May 3, 1822 (House of Representatives Rep. No. 111 for the 17th Congress, 1st Session, pp.14–17)
- d. Andrew Stewart’s *Brief Description of the Works Executed by the Potomac Company*, May 22, 1826 (House of Representatives Report 228 for the 19th Congress, 1st Session, 62–63. Report repeated verbatim in accounts by C.F. Mercer in House of Representatives Report 90 for the 19th Congress, 2nd Session, 30–31, and in House of Representatives Report 47 for the 20th Congress, 1st Session, 45–46.)

**Descriptions of the Long Canal at the Shenandoah Falls
(along Maryland shore on the Potomac River above Harpers Ferry)**

	Pot. Co. 1808^a	Mason 1817^b	D.C. 1822^c	Moore 1820^d	Survey 1822^e	Stewart 1826^f
Difference of level	15 ft	15 ft	15 ft	26.75 ft	27 ft	
Total length	1760 yd	1760 yd	1760 yd			
Depth	“other canals 4 to 5 ft deep”	Sluices at House, Shenandoah & Seneca Falls “4 to 5 ft deep”	“other canals 4 to 5 ft deep”			
Width	“other canals 16 to 20 ft wide”	Sluices at House, Shenandoah & Seneca Falls “16 to 20 ft wide”	“other canals 16 to 20 ft wide”		“partial channels on Md. Side, 3 in number. The first ... 18 to 20 feet wide...”	Other works “widths varying from 16 to 25 feet”

Notes:

- a. Response of the Potomac Company to inquiries by the secretary of the U.S. treasury Albert Gallatin, January 20, 1808 (Potomac Company records and Bacon-Foster Appendix C)
- b. Letter from John Mason to Bernard Peyton, secretary of the Va. BPW, December 9 (or 6), 1817 (Va. BPW annual report, draft in Potomac Company records and Bacon-Foster Appendix D)
- c. Report of the Committee of the District of Columbia, May 3, 1822 (House of Representatives Rep. No. 111 for the 17th Congress, 1st Session, pages 14–17)
- d. Thomas Moore’s *The Potowmac River, and Its Connection with the Ohio* (Appendix I herein). Moore said: “The fall from the head of Shenandoah falls to the landing at Harpers Ferry is 26.75 feet. This was ascertained by finding the difference in the levels between the surface of the water in the U. S. canal when the gates were all shut and the water at the landing.”
- e. Joint commissioners’ 1822 survey report (Appendix II herein). The dimensions are from September 6, 1822, survey notes.
- f. Andrew Stewart’s *Brief Description of the Works Executed by the Potomac Company*, May 22, 1826 (House of Representatives Report 228 for the 19th Congress, 1st Session, 62–63. Report repeated verbatim in accounts by C.F. Mercer in House of Representatives Report 90 for the 19th Congress, 2nd Session, 30–31, and in House of Representatives Report 47 for the 20th Congress, 1st Session, 45–46.)

Descriptions of the House Falls Sluice (along West Virginia shore)

	Pot. Co. 1808^a	Mason 1817^b	D.C. 1822^c	Stewart 1826^d
Difference of level	3 ft	3 ft	3 ft	
Total length	50 yd	50 yd	50 yd	
Depth	“other canals 4 to 5 ft deep”	Sluices at House, Shenandoah & Seneca Falls “4 to 5 ft deep”	“other canals 4 to 5 ft deep”	
Width	“other canals 16 to 20 ft wide”	Sluices at House, Shenandoah & Seneca Falls “16 to 20 ft wide”	“other canals 16 to 20 ft wide”	Other works “widths varying from 16 to 25 feet”

Notes:

a. Response of the Potomac Company to inquiries by the secretary of the U.S. treasury, Albert Gallatin, January 20, 1808 (Potomac Company records and Bacon-Foster App. C)

b. Letter from John Mason to Bernard Peyton, secretary of the Va. BPW, December 9 (or 6), 1817 (Va. BPW annual report, draft in National Archives and Bacon-Foster App. D)

c. Report of the Committee of the District of Columbia, May 3, 1822 (House of Representatives Rep. No. 111 for the 17th Congress, 1st Session, pages 14–17)

d. Andrew Stewart’s *Brief Description of the Works Executed by the Potomac Company*, May 22, 1826 (House of Representatives Report 228 for the 19th Congress, 1st Session, 62-63. Report repeated verbatim in accounts by C.F. Mercer in House of Representatives Report 90 for the 19th Congress, 2nd Session, 30–31, and in House of Representatives Report 47 for the 20th Congress, 1st Session, 45-46.)

**Descriptions of the Shenandoah River Canals and Locks
(all along the Shenandoah River’s left bank)**

	Pot. Co. 1808^a	D.C. 1822^b	Harbaugh 1833^c
General canal depths	“other canals 4 to 5 ft deep”	“other canals 4 to 5 ft deep”	
General canal widths	“other canals 16 to 20 ft wide”	“other canals 16 to 20 ft wide”	

Littles Falls Canal & Locks (at Hopewell Mills)			
difference of level	10 ft 6 in	10 ft 6 in	
total length	180 yd	180 yd	
upper elliptical basin (or lock) length, width, & lift	130, 150, & 2 ft	130, 150, & 2 ft	
upper elliptical basin volume	(not stated)	(not stated)	
lower lock length, width, & lift	100, 12, & 8 ft	100, 12, & 8 ft	
lower lock volume	13,200 cubic ft.	13,200 cubic ft.	
lock material	granite, free stone near gates	granite, free stone near gates	
Wilson’s Upper Falls Canal & Lock (at Millville)			
difference of level	12 ft 6 in	12 ft 6 in	
total length	730 yd	730 yd	
lock length, width, & lift	100, 12, & 12 ft	100, 12, & 12 ft	
lock volume	18,000 cubic ft.	18,000 cubic ft.	
lock material	granite, free stone near gates	granite, free stone near gates	
Bulls Falls Canal (no locks)			
difference of level	4 ft	4 ft	
total length	300 yd	300 yd	
Wilson’s Lower Falls Canal & Lock (at Striders or Mill)			
difference of level	6 ½ ft	6 ½ ft	
total length	600 yd	600 yd	
lock length, width, & lift	100, 12, & 6 ft	100, 12, & 6 ft	
lock volume	10,800 ft ³	10,800 ft ³	
lock material	granite, free stone near gates	granite, free stone near gates	
Saw Mill Falls Canal & Locks			
difference of level	17 ft	17 ft	
total length	580 yd	580 yd	
upper lock length, width, & lift	100, 12, & 9 ft	100, 12, & 9 ft	90 ft, 10 ft, & 10 ft 2 in
upper lock volume	14,400 cubic ft.	14,400 cubic ft.	
lower lock length, width, & lift	100, 12, & 8 ft	100, 12, & 8 ft	90 ft, 10 ft, & 6 ft 2 in
lower lock volume	13,200 cubic ft.	13,200 cubic ft.	
lock material	granite, free stone near gates	granite, free stone near gates	fine cut stone, yellow sandstone at gate recesses

Notes:

a. Response of the Potomac Company to inquiries by the secretary of the U.S. treasury, Albert Gallatin, January 20, 1808 (Potomac Company records and Bacon-Foster App. C)

b. Report of the Committee of the District of Columbia, May 3, 1822 (House of Representatives Rep. No. 111 for the 17th Congress, 1st Session, pages 14-17)

c. *A Journal of the Accounts &c, Thomas Harbaugh, with the Potomac Company, and Other, from 1803 to 1833, 1833*

References

The following are the primary resources for this document:

Potomac Company records—The records of the Potomac Company (mostly handwritten meeting reports, correspondence, and ledgers from the company's records, 1785–1828) are in the National Archives College Park, Md. Annex in Record Group 79, Entries 159–179.

Bacon-Foster—Corra Bacon-Foster studied the Potomac Company's records almost 100 years ago, when they resided with the still-functioning C&O Canal Company. Her *Early Chapters in the Development of the Patomac Route to the West* summarizes these records and also presents good information on earlier Potomac navigation schemes. Her work was issued in the *Records of the Columbia Historical Society for 1911*, and then published as a book in 1912. This author referred to a 1971 reprint of the book, published by Burton Franklin, New York.

George Washington papers—George Washington was a prolific writer who recorded his plans and observations about Potomac navigation over and over again in diary entries and letters, until his death in 1799. His enthusiasm, attention to detail, and hands-on approach make his Potomac-related citations superior to those written by later directors and presidents of the Potomac Company, who seemed loath to ride to construction sites or boat the Potomac as Washington had. Two primary hardcopy sources of Washington's papers were John C. Fitzpatrick's multivolume *Writings of George Washington* and Donald Jackson's and Dorothy Twohig's *The Diaries of George Washington*. These are available on-line and searchable at the Library of Congress's George Washington Papers website (<http://memory.loc.gov/ammem/gwhtml/gwhome.html>), and at the University of Virginia's George Washington Resources (<http://etext.lib.virginia.edu/washington/>).

Nute—John Mason once held “a large bundle of papers related to the opening of navigation up the Potomac River, which had been entrusted to him by General Washington, a year or two before the latter's death.” By some mysterious path, these wound up at the Minnesota Historical Society. In 1923, Grace L. Nute summarized these documents in her “Washington and the Potomac: Manuscripts of the Minnesota Historical Society,” for the *American Historical Review*. Part I was in Volume XXVII, No. 3 (April 1923) and Part II was in Volume XXVII, No. 4 (July 1923).

Va. BPW reports—Beginning with its formation in 1816, the Virginia Board of Public Works printed annual reports that included status reports from the Potomac Company. The Va. BPW reports also contained river survey reports, including those from Thomas Moore's 1820 Potomac survey, a version of the joint commissioners' report from their 1822 survey, and Claudius Crozet's survey of Potomac tributaries.

Congressional reports—When the U.S. Congress became interested in plans to build an independent canal along the Potomac in the 1820s, it published several reports that contained information about the Potomac Company and early navigation on the upper Potomac River. These reports include House Report (HR) 11 and 530 from the 17th Congress, 1st session; HR 228 from the 19th Congress, 1st Session; HR 90 from the 19th Congress, 2nd Session; HR 414 from the 23rd Congress, 1st Session; HR 47 from the 20th Congress, 1st Session; and Senate Report 610 from the 26th Congress, 1st Session.

The following are other recommended readings about navigation on the Potomac River and its tributaries:

- Achenbach, Joel. *The Grand Idea—George Washington's Potomac and the Race to the West*, Simon & Schuster, New York, 2004.
- Garrett, Wilbur. "George Washington's Patowmack Canal," *National Geographic*, June 1987, pages 716 through 753.
- Kapsch, Robert J. *The Potomac Canal: George Washington and the Waterway West*, Morgantown, West Virginia University Press, 2007.
- Sanderlin, Walter S. *The Great National Project—A History of the Chesapeake and Ohio Canal*, Baltimore, The Johns Hopkins Press, 1946.
- Stanton, Richard. *Potomac Journey: Fairfax Stone to Tidewater*, Smithsonian Institution Press, 1993.
- Trout, William E., III. *The Shenandoah River Atlas*, Virginia Canals & Navigations Society, 1997.