

HISTORIC STRUCTURE REPORT

FOR THE

U.S. RIFLE FACTORY BRIDGES,

CANAL, AND DAM ON THE SHENANDOAH RIVER,

LOWER HALL ISLAND, 1796 - 1885.

Harpers Ferry National Historical Park,

West Virginia,

by

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PREFACE

This report brings together all available documentary evidence relating to the U.S. Canal, Dam, and Bridges of the U.S. Rifle Factory, Lower Hall Island, Shenandoah River, for the years 1796 to 1885.

The report thus makes possible for the first time, a detailed study of this phase of the physical history of the Lower Hall Island.

Charles W. Snell
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April 30, 1981

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Chapter I, HISTORY OF THE LOWER HALL ISLAND, 1751 - 1818

1. The Hall Islands, 1751 - 1797:

The land that was to form the future site of the United States Armory at Harpers Ferry, Virginia, in 1796-97, was originally owned by Robert Harper, under two patents made to him from Lord Thomas Fairfax, proprietor of the "Northern Neck" of Virginia: one dated April 25, 1751¹ for 125 acres, and the second, dated April 19, 1762, for 92 acres.¹ Robert Harper, a millwright from Pennsylvania, resided at and improved his wilderness property at Harpers Ferry from 1751 until his death in October 1782. He constructed and operated a saw mill and flour mill, both situated on the Hall Islands, during these years and his residence was also located on the main land, but fronting on the Upper Hall Island (see Maps. No. 1 and 2).

Under his will, Harper bequeathed the western half, including his residence and flour and saw mills on the Shenandoah River, to his nephew Robert Griffith. The eastern half, which included his new stone tavern and his ferry rights on the Potomac River, Harper left to his niece, Sarah Harper, who was the wife of John Wager, Sr.² On January 9, 1797, Robert Griffith's son and heir sold the land including the Upper and Lower Hall Islands to²³ Thomas Rutherford, William Darke Van Rutherford, and Mary Rutherford.

1. Lord Fairfax's deed to Robert Harper of April 25, 1751, is in the Northern Grants Books, Book No. 6, p. 496, for 125 acres, in Virginia State Library, Richmond, Va. Data on the 2nd deed for 92 acres, dated April 19, 1796, from the recital of facts regarding the chain of ownership in Thomas Rutherford and others deed of B. & S., dated February 20, 1797, to the United States Government, in National Archives, Washington, D.C., Record Group 121, Public Buildings Service, Entry 75, Warranty Deeds and Correspondence, Harpers Ferry, W. Va., 1797-1880, Tray No. 1.

2. Last Will of Robert Harper of Berkeley County, Va., dated September 26, 1782, probated October 15, 1782, in National Archives Record Group 153, Military Reservation Division, Box No. 44- has copy of Harper's will.

3. Deed of Rutherford & Others to U.S. February 20, 1797, National Archives R.G. 121.

2

2. Establishment of the Harper's Ferry Armory and Acquisition
of Land for the Site, 1794-1797:

On April 2, 1794, President George Washington approved "An Act to provide¹
for the erecting and repairing of Arsenals and Magazines, and other purposes."
This law directed the President to establish three or four arsenals for the
storage of arms and also three or four national armories to manufacture small²
arms. Acting under this authority, President Washington selected Harpers
Ferry, Virginia, as the site of one of the new U.S. Armories and Arsenals,
and directed to the War Department to purchase land at the junction of the
Potomac and Shenandoah Rivers for this purpose.³

The 426 acres comprising the future site of the Armory and Arsenal
was purchased from two parties for a total \$ 17,016.66 in 1796 and 1797:
On June 15, 1796, John Wager, Jr. and his family conveyed about 117½ acres to⁴
the United States for \$ 7,016.66 ; on February 20, 1797, Thomas Rutherford,
William Darke Van Rutherford, and Mary Rutherford sold approximately 310½⁵
acres to the United States for \$ 10,000. This acquisition included the
13- acre site of the John H. Hall and U.S. Rifle Works, located on what
later became known as the Upper and Lower Hall Islands, with the Rifle Factories
being situated on the Lower Island and Armory Dwelling Houses on the Upper
Island.

3. Construction the U.S. Armory and Arsenal, 1798 -1801

The chief manufacturing plant, known as the U.S. Musket Factory of the

1. U.S. Statues at Large, Vol. I, p.352.
2. Ibid.
3. For this involved story see, Snell, Charles W., "A History of the Physical
Plant of the U.S. Armory at Harper's Ferry, Virginia, Its Evolution and
Development, Harpers Ferry National Historical Park, West Virginia, Volume I,
(1794-1841)(N.P.S. Typescript, National Capital Team, Denver Service Center,
August 1980), Vol. I, Chapter II.
4. Deed in National Archives Record Group No. 121, Public Buildings Service,
Entry No. 75, Warranty Deeds and Correspondence, 1796-1884, for Public Lands
at Harpers Ferry, W.Va.
5. Deed in National Archives Record Group 121, Entry 75, Washington, D.C.

Armory was to be located on the Potomac River side of Harper's Ferry. War Department personnel reported for duty at Harpers Ferry in the late summer of 1798 and construction of workshops for the Armory and a large arsenal to store arms got underway in 1799 and was completed in 1801. The production of small arms began at Harpers Ferry in the summer of 1801.

During the period 1798 to 1806, the Armory appears to have used Harper's old saw mill for sawing the timber used in the construction of the workshops of the U.S. Musket Factory on the Potomac and for erecting two arsenal buildings to store arms. Harper's frame or log dwelling also apparently served as a residence for an Armory employee.

4. Constructing the Shenandoah Canal, Upper and Lower Locks, and a new Armory Sawmill, 1806-07:

In 1802 the Potowmack Company finally completed its project begun in 1785, of rending the Potomac open to navaigation by boats of shallow draft, by removing obstructions in the river and by-passing falls with a series of short canals and locks. In 1803 they began work on a similar project to improve navigation on the Shenandoah River. In February 1803, Leonard Harbaugh, the engineer who had supervised the construction of the Potomac Company canals and locks at Little and Great Falls, 1794-1802, and the surveyer Nicholas King, visited Harper's Ferry and drafted a detailed map in three sheets for a series of locks and canals to be constructed through the public lands of the Armory. Their plan, entitled "Plan and Section of a Canal at the Lower Falls of the Shenandoah, and its junction with the public (Armory) Canal at Harpers Ferry, and the necessary Locks, Surveyed and Levelled by

"N. King and L. Harbaugh for the U.S. and the Potomac Company, February, 1803,"¹

called for the construction of a canal through the public lands of the U.S. Armory at Harper's Ferry, beginning at the Hall Islands and following the general course and the same land that is now occupied by Shenandoah Street. Two locks were called for, an upper set at the Hall Islands, and the lower set, located in the present Shenandoah Street, between the Large Arsenal site and the present sites of Park Bldgs. No. 9, 10, 11, and 12. The proposed Shenandoah canal was then to have continued northward from this point and to have flowed into the Potomac. The plan also suggested that the Armory canal or raceway through the Musket Factory be enlarged and improved so that it could be used by boats coming down the Potomac and also that the Armory canal be extended southward to form a junction with the proposed Shenandoah canal. The 1803 plan was never adopted, perhaps because of cost and the opposition of both the Wager family and U.S. Armory to the loss of their land.

As actually built in 1806-07, the Shenandoah Canal was constructed only through United States Armory land on the Upper and Lower Hall Islands, where two sets of locks were built at the upper and lower ends of the islands. East, or below the Halls Islands, the canal company improved an existing river channel that passed along the north side of what later became known as Virginus Island and that finally reentered the main river bed at the lower or eastern end of that island. To build across the Hall Islands, however, required that grant of a right of way by the United States to the canal company. (See Map No. 2- 1807).

On March 3, 1806, President Thomas Jefferson and the president and directors of the Potomac Company entered into an agreement which reads in part: "whereas the said Company are anxious to improve the Navigation of the River Shenandoah by means of a Canal to be taken out of said River upon the Ground belonging to the U. States and Continued

MAP No. 1

"Plan and Section of a Canal at the lower Falls of the Shenandoah, and its junction with the public Canal at HARPER'S FERRY, and the necessary Locks. Surveyed & levelled by N. King, and L. Harbaugh for the U.S. and the Potomak Company. Feby. 1803. Surveyed and drawn by N. King. Scale 16 perches to an inch.

National Archives Record Group 79. Records of the National Park Service, Chesapeake and Ohio Canal, No. 1. Cartographic Division, National Archives, Washington, D.C.

Buildings with numbers are Armory structures standing on U.S. land. Numbers have been added to map by author.

Extract from map showing the Hall Island in the Shenandoah River.

Bldg. No. 22- Armory sawmill, which had been erected by Robert Harper prior to 1782.

Bldg. No. 24, frame or log residence. The home of Robert Harper and the house in which he died in 1782.

Bldg. No. 23, frame or log building, probably a barn, erected by Harper prior to 1782.

The Upper and Lower Hall Islands

Later known as Virginus Island

S H E N A N D O A H

Section

"down to a point at or near the old Saw Mill upon said Grounds(Harper's and the Armory old saw mill at H,I,K , on Map 2), where

it is proposed to descend by means of Locks into the bed of the River. In consideration whereof they agree that the U. States may have the full use and benefit of the Surplus Water in said Canal..." In return the U.S. granted the Company the right and privilege "of cutting making and Keeping in Repair at their own proper and exclusive expence a Canal." The U.S. also granted the right of "digging and taking Stone Rocks and gravel from such parts of the public land as Shall not be injurious to the United States... also the Right of making keeping in Repair and using towing passages on the banks of the said Canal,... together with the use and occupancy at all times of a sufficient Space of Ground on each side of the Locks as shall be proper for a Toll house and other necessary use of said Locks..."

The Potomac Company completed the construction of this Shenandoah Canal and its two locks in 1807. The 1807 map, prepared by Samuel Ammin, shows how the canal and locks were actually built on the U.S. lands on the Hall Islands in 1806-07. (map No.2)

The construction of the Shenandoah Canal in 1806-07 probably improved the water power potential of the Hall Islands for the United States. The Potomac Company also built a new saw mill for the Armory at H, to replace Harper's old mill, which was destroyed by the construction of the Lower Locks.

1. Record of the Judge Advocate General, National Archives Record Group No. 153, Military Reservation Division, 1809-1942, Reservation File, West Virginia, box 44, also on NHP Micro. Reel 22, Vol. 13, 1265-67.
2. 1807 Plat- map No. 44, Drawer No. 11, Harpers Ferry NHP Park map case. Also Secretary of War to Samuel Ammin, April 21, 1807, NHP Reel 18, V. 1, p.50, and Secretary of War to Ammin, May 14, 1807, Reel 18, V.1, p.52.

Plat of Hall Island, 1807-"Plat No. 62" "

(Showing the Shenandoah River, the newly constructed Shenandoah Canal and locks running through the Hall Island, the house where Robert Harper died and the location of his saw mill and flour mill).

Plat accompanied the letter of Paymaster Samuel Ammin of the Harper's Ferry Armory to the War Department, dated May 14, 1807, Original in National Archives Cartographic Division, Washington, D.C., in Record Group 77, Records of the Chief of Engineers, Dr, 118-62, Map No. 43. Also on Harpers D Ferry National Historical Park Microfilm Reel No. 18, Vol. 1, p.52(letter).

Scale: 8 perches to one inch.

Explanation of the Plat

- A. The beginning, at which place is three sycamores; - the leased land comes to these trees and no lower down the river.
- B. Shews where the Canal takes the water out of the river.
- D. The Dwelling house occupied by Leonard Harbaugh.
- E. Shews the way the waste water is carries off from the canal.
- F. Shews a situation where a mill may be built, to work two pair of six feet stones, and supplied with water by leading it along the old saw race to P and then by cutting a new race along the dotted lines to at which situation ten feet of fall may be had and a sufficient supply of water at all times without interfering with the supply of the Canal at
- G. Shews the new Saw mill, supplied with water from the Canal; at which place a mill ought to be built to work two pair of Six feet stones, with ten feet head of water.
- H I K Shews a Lock Gate, and the 1st and 2nd lock.
- M. Shews a situation for a Mill seat that may work two pair of Six feet stones which may have 17 feet head and fall of water, and be supplied by taking the water from the canal at the saw mill, G, and conducting it along the dotted lines to L, and there carrying it across the canal in a run; and if delivered on an overshot wheel the tail water cannot impede boats passing up or down.
- N. Shews where another Mill might be built to work two pair of Six feet stones, to be supplied with water in the same manner with the last, and have the same head of water.
- T. Shews the Dwelling of Harper Dec.
- XY The dotted line, shews where a dam might be made across that part of the river and the water in the time of a flood turned the other way, leaving an apperture in the dam to let enough through to supply the Boats with water which would prevent the mills below the locks being stopped by back water.

The lines shaded yellow shew the road to Harpers Ferry.

and down by a scale of 8 perches to an inch.

1807 Plat

Explanation of the Plat

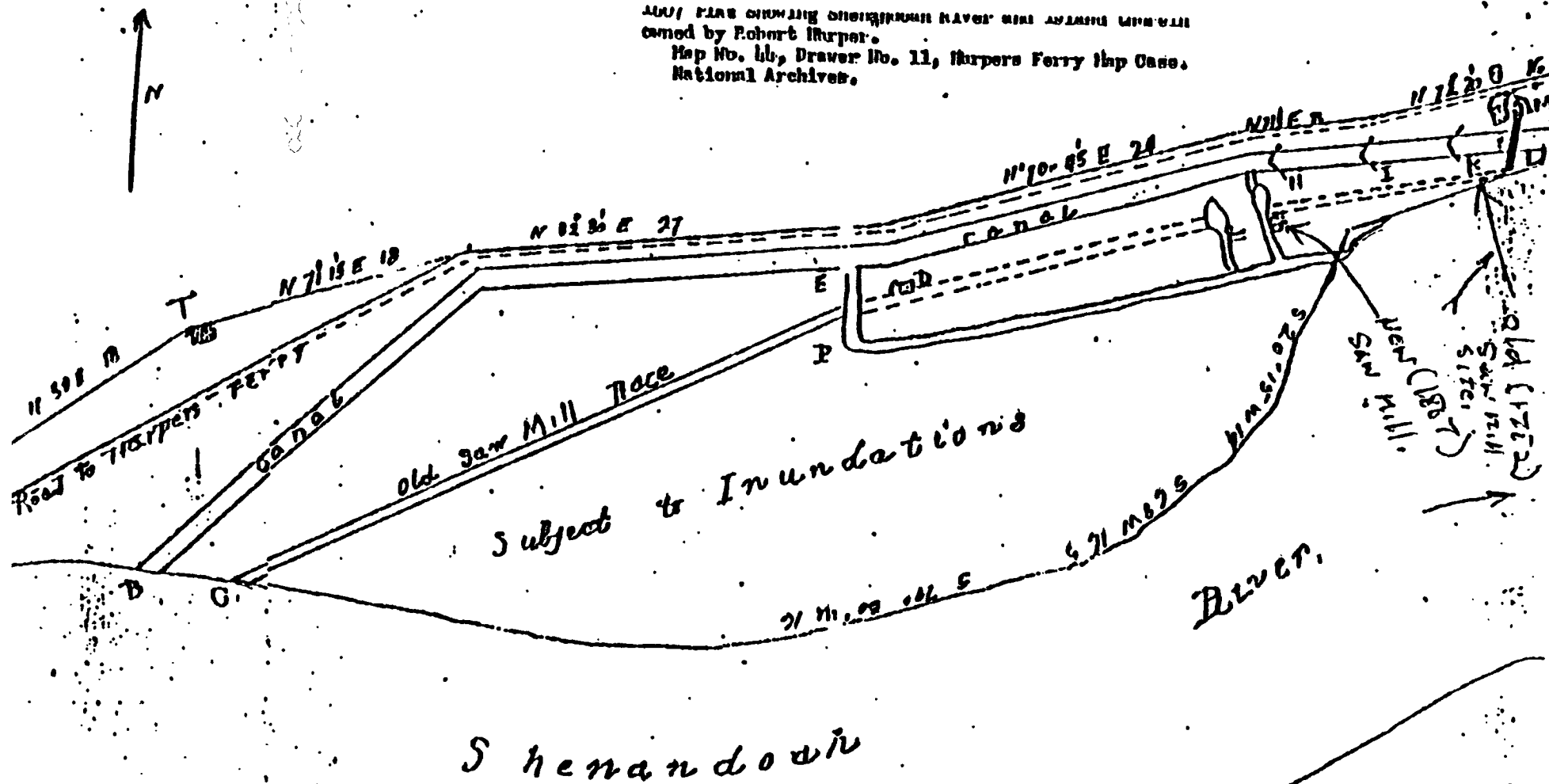
- A. The beginning, at which place is three sycamores; - the leased land comes to these trees and no lower down the river.
- B. Shows where the Canal takes the water out of the river.
- D. The Dwelling house occupied by Leonard Harbough.
- E. Shows the way the waste water is carries off from the canal.
- F. Shows a situation where a mill may be built, to work two pair of six foot stones, and supplied with water by leading it along the old saw mill race to P and then by cutting a new race along the dotted lines to F, at which situation ten feet of fall may be had and a sufficient supply of water at all times without interfering with the supply of the Canal at B.
- G. Shows the new Saw mill, supplied with water from the Canal; at which place a mill ought to be built to work two pair of Six feet stones, with ten feet head of water.
- H I K Shows a Lock Gate, and the 1st and 2nd lock.
- L. Shows a situation for a Mill seat that may work two pair of Six feet stones, which may have 17 feet head and fall of water, and be supplied by taking the water from the canal at the saw mill, G, and leading it along the dotted lines to L, and there carrying it across the canal in a trunk; and if delivered on an overshot wheel the tail water cannot impede the boats passing up or down.
- M. Shows where another Mill might be built to work two pair of Six feet stones, to be supplied with water in the same manner with the last, and have the same head of water.
- T. Shows the Dwelling of Harper Dec.
- XI The dotted line, shows where a dam might be made across that part of the river and the water in the time of a flood turned the other way; leaving an aperture in the dam to let enough through to supply the Boats passing; which would prevent the mills below the locks being stopped by back water.

The lines shaded yellow show the road to Harpers Ferry.

laid down by a scale of 8 perches to an inch.

UPPER AND LOWER HALL ISLANDS IN 1807

MAP OF THE CHANNING DISTRICT HALLS AND ADJACENT WATERS
 named by Robert Harpur.
 Map No. 46, Drawer No. 11, Harpers Ferry Map Case.
 National Archives.



5. Two Armory Water Shops Built, 1808-10:

With war clouds threatening the United States, the Armory at Harper's Ferry was enlarged in 1808-10 and two workshop were constructed on the Lower Hall Island, thus marking the beginning of U.S. use of the water power of the Shenandoah to manufacture arms. Two brick one-story water shops, a Grinding Mill for barrels, 80 by 45 feet, and a Tilt Hammer Shop, 45 by 45 feet , were functioning on the Lower Hall Island by 1810. These, with the Armory saw mill, a one-story frame building 50 by 16 feet, comprised the entire Armory plant on the Lower Hall Island from 1808 to 1818.

No evidence has been found to indicate that Armory made any improvements to the Shenandoah Canal during this period or that the United States constructed a dam on the Shenandoah. A bridge was probably constructed over the canal to reach the shops on the Lower Hall Island ca. 1808-10, but again no definite evidence has been found to document such a bridge.

The Shenandoah Canal and the Lower Hall Island, 1819 -18291. The Armory and John H. Hall Manufacturing Plants.

From 1819 until June 1831, the Lower Hall Island was to be the site of two independent arms manufacturing operations; the armory continued using the water shops as part of the main production at the Musket Factory; and second, Captain John H. Hall arrived in Harper's Ferry in 1819 to begin his experiments in the production of the Hall Patent Rifle. The inventor was given several shops on the Lower Hall Island which functioned along side the main Armory operations. In June 1831, Hall was given control of all the old Armory shops on the Lower Hall Island and all regular Armory manufacturing was removed to the Musket Factory and the Lower Hall Island, 1831 to 1844, devoted solely to the production of the Hall Rifle.

On March 19, 1819, Captain John H. Hall signed a contract with the United States to produce 1,000 of his patent breechloading rifles at Harper's Ferry. In the fall of 1819, the 1807 Armory Saw Mill was remodelled into a machine shop and turned over to Hall for his use. A two-story stone blacksmith or forging shop, 30 by 30 feet was also erected at Hall's request. As a result, no doubt, of the increased use of the Lower Hall Island, two stone bridges were erected in 1820- one over the Shenandoah Canal and the other over a trail race of one of the three water shops. In 1823-24 Hall's frame machine shop was enlarged and a second water wheel, 10 feet in diameter, installed in the addition. In 1827, a large stone addition was made to the 1808-10 grinding mill and a second water wheel, also 10 feet in diameter, was built in the new wing. Hall's first contract proved to be a success and the U.S. and the inventor entered into a second contract in 1827. The improved grinding mill was turned over to Hall by the Armory in 1827 and other new structures were built for Hall's plant in 1827-28. A one-story 45-foot-square brick tilt hammer shop was probably also erected in 1828, thus increasing the number of water wheels in use on the island from three in 1810 to six by 1829.

2. The Shenandoah Canal, 1822 - 1829:

With the increased use of the facilities on the Lower Hall Island after 1820, the U.S. Armory did spend money to improvement the canal on the road (Shenandoah Street) along the canal on the mainland side.

The National Armory Account report for the year 1823 indicates that a total of \$ 2,279.50 was spent for "building a wall between the road (Shenandoah Street) leading to the Works on the Shenandoah and said river and for raising the Bank of the Canal on the Shenandoah." The vouchers of the Armory Paymaster (see Chart A, page 12), however, reveals that a grand total of \$ 2,439.50 was actually spent for these two purposes in 1823-24.

The masons James McNulty, Philip Strider, and Michael Walsh were paid a total of \$ 2,088.00 for quarrying, hauling, and laying 2,088 perches of stone wall " in a wall between the river and the road and for filling in with earth behind the wall, between the wall and the road.

James McLaughlin and Charles Elvay received a total of \$ 342.50 for raising the bank of the Shenandoah canal two feet in height for 76½ rods in length and varying in width from 10 to 12 feet with earth in 1823-24. This work was done to prevent the canal from overflowing.

In 1826 \$ 60.83 was spent for "Filling in¹ (with) earth along Shenandoah river."

The total amount of money spent on the Shenandoah Canal for repairs and improvements, excusive of work on the Shenandoah dam, from 1822 to 1829, totalled approximately \$ 2,500.33.

1. National Armory Accounts for 1826.

CHART A

Shenandoah River Wall, between Street and River, 1823

File No.	Voung No.	Artisan	Date	Amount	Remarks
7356	70A	James McNulty	9/30/23	\$ 555.00	For laying 555 perches of stone in the wall between the road up the Shenandoah River & the said River and filling up between the wall on the road side with earth
7624	150A	" "	12/31/23	455.00	For laying 455 perches of stone in the river wall.
Subtotal		James McNulty	1823	\$ 1,010.00	1,010 perches stone wall.
7207	110A	Philip Strider	6/30/23	\$ 90.00	For quarrying,hauling & laying 90 perches of stone in wall between river & road and filling in with dirt.
7356	3A	Philip Strider	8/27/23	\$ 196.00	For laying 196 perch stone in the river wall.
Subtotal		Philip Strider	1823	286.00	Laying 286 perches stone in wall
7207	11A	Michael Walsh	6/30/23	\$ 120.00	For quarrying,hauling & laying 120 perch stone in river wall along Shenandoah Street.
7232	2A	" "	7/27/23	\$ 281.00	For 281 perch stone wall & backfilling with earth.
7356	35A	" "	8/30/23	\$ 150.00	For 150 perch stone wall.
7356	79A	" "	9/20/23	\$ 156.00	For 156bpercnin river wall.
7624	125A	" "	12/31/23	\$ 85.00	For 85 perches stone in river wall.
Subtotal:		Michael Walsh	1823	\$ 792.00	For 792 perch stoneriver wall.
Total STONE RIVER WALL PROJECT: 1823				\$ 2,088.00	For 2,088 perches stone wall.
Raising Bank of Canal on Shenandoah with Stone and earth to prevent the water from overflowing, 1823 -24:					
7624	161A	James McLaughlin	12/21/23	182.50	For raising bank 36½ rods in length, two feet in height, and 12 feet in width.
7862	71A	Charles Elvay	3/22/24	\$ 160.00	For raising canal bank 2 feet in height, 40 perches in length and 10 feet in width.
Total: Raising Embankment, Shenandoah				\$ 342.50	For raising Shenandoah Canal bank 2 feet in height for distance 76½ rods and from 10 to 12 feet in width.
GRAND TOTAL: SHENANDOAH WALL AND 1823- EMBAKMENT PROJECTS 1824				\$ 2,430.50	

EXPENDITURES ON THE SHENANDOAH CANAL,
1822 - 1829

Year:	Shenandoah Canal
1822	-
1823	\$ 2,279.50
1824	160.00
1825	
1826	60.83
1827	
1828	
1829	
TOTAL:	\$ 2,500.33

CHAPTER IIIU.S. Rifle Factory and the Shenandoah Canal,
1830 - 1841

In June 1831, Captain John H. Hall was given the last Armory operated water shop, the 1808-10 Tilt Hammer Shop, on the Lower Hall Island to use in the manufacture of the patent rifle. The old shop was improved and enlarged and a second water wheel was probably installed in the remodelled structure 1833. The main efforts during this period, 1833-34, as we shall see in a later chapter, were devoted to ensuring and improving the supply of water available to turn the wheels of the Hall shops by constructing an efficient dam across the Shenandoah River.

Work on a New Rifle Factory "Canal", 1835.

During July 1835 the waterways at the Rifle Factory were altered in some manner at a cost of \$ 207.18. Vouchers for the labor involved describe the work as "removing earth from the new canal at the Rifle Factory" and "removing earth from canal and from guard gates." The project involved

the following elements: The labor of 13 men digging, whose combined work totalled 135½ working days for.....\$ 135.25
 To Frederick Yost for blasting rock..... 2.75
 To Patrick Byrne for 34½ days hauling earth with 3 horses and carts..... 51.75
 To Patrick Rice, for 11 3/8 days use of horse and cart..... 17.43
All paid off July 7-11, 1835: \$ 207.18 (1)

A comparison of Maps 4 and 5 (both made in 1834) with Map 6 prepared in 1848), suggests that perhaps the Shenandoah Canal, as it passed the Hall Islands between the Upper and Lower Locks, may have been widened.

In the period 1836-1838 additional workshops were built for Hall and two of the old watershops were replaced by new ones. In 1836 a Drill Shop(Bldg. No. 18 on the 1848 map), one-story brick, 50 by 17½ feet, was erected and replaced Hall's 1819 Machine shop. In 1837-38 a large new Tilt Hammer or Barrel Welding Shop, stone, 35 by 20 feet, 15 feet high, one story, was built(Bldg. No. 7 on 1848 map) and replaced the old 1809-10 tilt hammer shop.

The records of the Armory Pay Master, however, indicate that no major repairs or improvements were made to the Shenandoah Canal by the Armory during the years 1836 to 1841.

Armory Expenditures on the Shenandoah Canal,
1830 - 1841

Year	Canal
1830	
1831+	
1832	
1833*	
1834	
1835	\$ 207.18
1836	0
1837	0
1838	0
1839	0
1840	0
1841	0
Total:	\$ 207.18

1. U.S. Shenandoah Canal at the Rifle Factory; 1842- 44:

No money was appropriated for making repairs and improvements to the U.S. Shenandoah Canal at the Rifle Factory during the period 1842 to 1844. Major Henry K. Craig, however, spent a total of \$ 298.91 for such work at the Rifle Factory during these years, as follows:

The mason George N. Lynch was paid \$ 170.44 during the summer of 1843 "for erecting a wall at the Rifle Factory for guard lock of Shenandoah Canal to W. & P. Railroad and for lock down same canal". Lynch erected 106.72 perches of stone wall, charging \$ 146.74. He also filled in behind the ^{wall} with 118 14/27 cubic yards of earth embankment at a charge of \$ 23.70.¹²

The remaining balance, \$ 111.47, went to William Newton for 2,286 feet 9 inches of locust timber, which was used to repair the wooden bridge over the Shenandoah Canal.²

Expenditures on the U.S. Shenandoah Canal
1842 - 1844

Year	Amount
1842	\$ 17.00
1843	281.91
1844	0
TOTAL:	\$ 298.91

1. 3rd S., F. 440, V. 9, to George N. Lynch, August 18, 1843, for \$ 170.44.
2. 3rd S. F. 630, V. 59, December 30, 1843. \$ 102.90 for the lumber and \$ 8.57 for repairing the bridge.

2. The Shenandoah Canal, 1845 - 1851:

in the estimates for the 1848-49 fiscal year Major John Symington requested the sum of \$ 3,320 "for completing the main tail race, reconstructing the guard lock and gates, cleaning the canal and walling it in front of the shops at the rifle factory," explaining:

"The old works at this place have given out, the gates and sills being entirely decayed. This work has been commenced from the necessity of the case, and amount estimated is necessary for its completion."

The money for this work was appropriated on August 14, 1848.

The new main tail race mentioned above had been started in in 1846-47 and ran along the rear or to the south of the new work shops being constructed at the rifle factory. In his annual report for the fiscal year ending, June 30, 1847, Symington first reported "A main tail race, to receive the waste water from the different wheels, 10 feet wide, 6 feet high, and covered over; side walls 2½ feet thick, of large stones, has been commenced, and 223 feet in length completed."

The Armory paymaster's vouchers for the period July 1, 1847 to December 31, 1847 are missing from the National Archives Record Group 217 files, so it is impossible to provide any further details on the cost of construction and amounts of material used under the August 14, 1848 appropriation.

In his annual report for the fiscal year ending June 30, 1848, Symington noted: "New guard gates, with feeders, with new substantial walls of masonry, have been constructed for the armory canal (at the rifle factory)."

1. Serial No. 515, Document No. 2, pp.110,111.item No.5.

2. U.S. Statues at Large, IX, p.306.

3.Serial No.503, Document No.1, p.692, Item No/ 1.

4.Serial No. 537, Document No. 1, p.348.

No money was appropriated or work was done on the Shenandoah Canal in 1849. and 1850. In the estimate for the 1850-51 fiscal year, as has been noted, Superintendent Symington asked for \$ 645 to construct a new bridge across the Shenandoah Canal. Congress voted the desired amount on September 28, 1850.

During 1851 Symington spent a total of \$ 1,746.48 for repairs and improvements on the Rifle Factory Canal as follows:

In April 1851, the mason Edward Tearney was paid \$ 927.50 for constructing a drain culvert and a revetment wall at the rifle factory:

\$ 14.61 for 48 20/27 cubic yards excavation of earth @ 30 c per yard.
 89.90 for 179 22/27 cubic yards excavation of earth in water
 at 50c per yards.
 33.60 for 22 10/25 perches of dry masonry wall @ \$1.50. drain culvert.
 789.48 for 526 8/25 perches of dry masonry @ \$ 1.50.
\$ 927.50. 5.

The balance, \$ 818.98, as has been noted, went to Edward Tearney and Jeremiah Fuss for constructing the new bridge across the Shenandoah Canal during the summer of 1851.

U.S. Shenandoah Canal at Rifle Works, 1845- 1851

Calendar Year	Recorded Expenditures	Appropriated for Canal
1845	0	0
1846	0	0
1847	0	0
1848	0	0
1849	0	0
1850	0	645.00
1851	\$ 1,746.48	0
Total	\$ 1,746.48	\$ 645.00

1. Revetment Walls and New Waste Way, 1852 - 1854:

In the annual estimates for the 1853-54 fiscal year, Brevet Colonel Benjamin Huger requested \$ 5,000 "for repairs of canal at the rifle works, and constructing a revetment wall along that portion (about one-half) where there is no such wall; and for opening a new waste-way and closing the old, and repairing the canal bridge."; it was explained: "The canal requires repairs in that part without revetment wall, which the construction of such a wall will, in a great measure, prevent hereafter. The waste-way is now at the upper end of the canal and leaves no current in the lower part. By moving the waste-way to the lower end of the canal, and building the revetment wall, the _____ deposit will be lessened, and the necessity of stopping the works to clear out the canal will be avoided."¹ The amount requested was appropriated by Congress on March 3, 1853.²

In his report for the fiscal year ending June 30, 1853, Superintendent Huger announced that at the rifle factory:

"A _____ dry stone wall has been built all along the basin on the opposite (north) side of the canal, to the works, two sections on each side of the bridge to raise the edge of the canal, and so grade the road as to draw off the water from the road (Shenandoah Street) and hill-side, which has heretofore washed large deposits of earth into the basin: for this purpose 409 feet of dry wall, nearly 6 feet high by 3 wide, have been built; 700 cubic yards filling put in.

"A dry wall, 224 feet long, 6½ feet high, and 3 feet thick, has been built along the southeast (workshop) side of the canal, adjoining the finishing shop (Bldg. No. 3) [Bldg. No. 1 on 1848 map] and across the opening of old sluice-way, which has been filled up. This completes the walling-in of the whole basin.

The accumulated deposits from this basin were excavated and removed, amounting

1. Serial No. 675, Document No. 2, p. 257, 258, item No. 8.
2. U.S. Statutes at Large, X, p. 217.

3

" to near 2,000 cubic yards."

No further further construction was reported on the Shenandoah Canal
 4
 in the report for the fiscal year ending June 30, 1854.

The stone walls and improvements made to the canal at the Rifle
 Factory in 1853-54 can be seen in the 1857 lithograph, Harpers Ferry NHP
 Negative No. 490.

APPROPRIATIONS FOR THE U.S.
RIFLE FACTORY CANAL, 1852 -June 30, 1860:

Date & Year	Amount for Canal	
8/31/52	\$ 0	
3/3/53	5,000	
8/5/54	0	
3/3/55	3,505	
8/30/56	0	
3/3/57	0	
6/12/58	2,000	
3/3/59	0	
6/12/60	0	
1852-60, Total:	\$ 10,505	(1)

3. Serial No. 692, Document No.1, p. 278.

4. Serial No. 747, p. 362.

(1) appropriated on March 2, 1861 was \$ 11,129 for rebuilding the Shenandoah Canal. This money, however, was never utilized.

2. U.S. Rifle Factory Canal on the Shenandoah, 1855-1861:

The estimates for the 1855-56 fiscal year requested \$ 3,505 "For repairs of canal embankment walls on the southwest and river sides, and of the canal and dams at the rifle factory." Major William H. Bell explained that "These walls and embankments were principally injured by the great flood of April 1852, also, in some degree, by heavy rains of the last two years; and the above amount is requisite to put them in proper repair."¹ Congress appropriated the requested amount on March 3, 1855.²

In the annual report for the year ending June 30, 1856, Superintendent Henry W. Clowe reported that "5,823 feet of dry wall, varying from one to six feet in height and from two to four feet in thickness, and 4,895 feet of coping, have been built and set on the armory canal." He also noted that "3,000 feet of excavation and filling [had been] made on the north and south bank[s] of the canal." He explained that "All of the foregoing, walling, fillings, and excavation was necessary to protect the banks of the canal from injury by floods, heavy rain, and other casualties."³

He further noted that "The wooden bridge across the canal has been weather-boarded and the frame covered to protect it from the weather."⁴

In his estimates for the 1858-59 fiscal year Superintendent Clowe asked for \$ 2,000 for a wall on the west (or north) bank of canal, rifle factory;" he explained "The county road (Shenandoah Street), running immediately along the margin of the canal, is constantly wearing away its banks and forming a slope from the road to the canal, facilitating the washing into the immediate channel of the canal of all kinds of rubbish and filth that accumulate on the surface of the road." Congress voted the \$ 2,000 for this project on June 12, 1858.⁵

1. Serial No. 781, p.238, Item No. 2.

2. U.S. Statutes at Large, X, p.637.

3. Serial No., 876.p. 390.

4. Ibid., p.389.

5. Serial No. 941, p193, 194, Item No. 5.

c.U.S. Statues at Large, Vol. 11, p. 335.

In His annual report for the fiscal year ending June 30, 1858, Superintendent Henry W. Clowe wrote that at the rifle factory "a part of the wall on the canal (had been) erected", and also noted "The gravel bar, arising from the wash of the ravine in the vicinity into the canal, has been removed, and the obstruction to the flow of the water temporarily obviated."

Alfred M. Barbour, the newly appointed superintendent of the Armory, described the completion of this project in his annual report for the fiscal year ending June 30, 1859, as follows:

"One thousand four hundred and seven perches heavy stone masonry, 1,459 feet stone coping, 405 yards earth excavation, and 507 yards filling of earth have been made in completion of a wall on the east (sic- west or north) bank of the canal at the rifle factory, protecting it on the county road side from the wash of the hill side, and depredations and incursions from that edge of the bank."

George Mauzy, who resided in an Armory Dwelling House located on the upper end of the Upper Hall Island, informed his friend James H. Burton on June 12, 1858, that this new wall ran from opposite the Rifle factory along the roadside of the canal west or up the river to a point opposite to his residence,

In his report for the year ending June 30, 1860, Barbour briefly noted that "the canal at the rifle factory and the musket factory have been repaired to such an extent as the occasion required, so as to render them both efficient."

6. Serial No. 976, p.1321.

7. Serial No. 1025, p.1115.

8. Mauzy to Burton, June 12, 1858

9. Serial No. 1079, pp.973-974.

Construction on the Shenandoah Canal Revetment
Walls, 1852 to June 30, 1860

Finished June 30:		DRY WALLS				Filling	Excavation
		Length	Height	Thickness	Coping		
1853	North	409 ft. (1)	6 ft.	3 ft		700 cu.yds	2,000 cu. yds.
1853	South	224 ft (2) 633 ft.	6½ ft.	3 ft.			
1856	both-	5,823 ft (3)	1 to 6 ft.	2-4 ft.	4,895 ft.		3,000 cu. yds.
1860	North	1,407 perch (4)			1,459 ft.	507 cu.vds.	405 cu. vds.

1. North bank of canal, on both sides of the Stone arch bridge.
2. South bank of Canal, on shop side, by Finishing Shop, Bldg. No. 3 and across filled up opening of former sluice way.
3. On both sides of the canal.
4. Along north bank (Shenandoah Street side), from opposite Rifle Factory island, west to upper end of the Upper Hall Island.

Total appropriations for the Shenandoah Canal, including bridges, from 1842 to June 30, 1860, were \$ 11,150, and total expenditures on the canal during these same years were probably about \$ 12,550. 39.

3. Plans to Rebuilt the Shenandoah Canal.1861:

In his estimates for the 1861-62 fiscal year Superintendent Alfred M. Barbour requested \$ 11,129 "for enlargement and protection of rifle factory canal;" He explained: "... Originally this canal was made by a joint stock company (in 1807), to facilitate the navigation from the upper country bordering on the Shenandoah river, and was not designed for the purposes to which the water power derived from it is now devoted. In effecting the improvement here proposed, a stone wall will be necessary to render the water-power of the rifle factory sufficient; and also to protect from inundation the land and tenements of the government between this canal and the Shenandoah river. These (on the Hall Islands) are occupied by operatives of the armory and are very valuable (??)."

Congress appropriated the desired \$ 11,129 on March 2, 1861,² but the Confederature capture of the Harpers Ferry armory on April 19, 1861 ensured that none of this money was ever spent on rebuilding the Shenandoah Canal at the U.S. Rifle Factory.

1. Serial No. 1092, pp. 322, 323, item No. 2.
2. U.S. Statues at Large, XII, p. 202.

BRIDGES OVER THE SHENANDOAH CANAL TO THE LOWER HALL ISLAND,
1820 - 1861

The first bridge known to have been constructed over the Shenandoah Canal to the Lower Hall Island was a stone bridge that was built for the Armory at a cost of \$ 136.12 in December 1820. On December 27^m 1820, Thomas McKinney was paid \$ 40.00 for quarrying 100 perches of stone for "building a bridge over the canal on the Shenandoah."¹ On December 23, 1820, the mason Jonah N. Tompkins received \$ 96.12 " for laying 120 $\frac{1}{2}$ perches of stone wall in a bridge over the canal on the Shenandoah" and for "20 $\frac{1}{2}$ days laying brick in the arch of the above bridge."²

In 1828 the Armory spent \$ 333.00, reported to be one-third of the total cost of constructing a wooden bridge over "an arm of the Shenandoah."³ This bridge may have been built to the Island of Virginus, which was then being developed (1824-25) as an industrial site and which Armory Superintendent James Stubblefield held a personal vested interest.⁴

1. National Archives Record Group 217, Second Auditor's Account, File 4591, Voucher No 15, December 27, 1820- to Jonah N. Tompkins.
2. National Archives R.G. 217, File 4591, Voucher No. 2, December 23, 1820.
3. Entry 935, National Armory Accounts.
4. Continued, Jefferson County Courthouse, Charlestown, W.Va., Articles of Agreement, Stubblefield and Shenandoah Canal Company, August 31, 1824.

4. In August 1824, Stubblefield had purchased the island of Virginus, 12 acres, for \$ 15,000 and in December 1824 sold it to four individuals in four tracts for \$ 29,000. These men were still paying off their mortgages to Stubblefield in 1829. On August 31, 1824, Stubblefield had entered into an agreement with the Shenandoah Canal Company that provided for the improvement of the water channel or canal that passed along the north side of Virginus island and which also granted him the right to erect a dam across the Shenandoah River so as to turn water into the canal to work mills situated on his island. Deed Book 13, p. 259-260, 8

In 1843 the bridge over the Shenandoah canal, apparently, was repaired at a cost of \$ 111.47.

William Newton received \$ 102.90 for providing 2,286 feet 9 inches of locust timber, which was used to repair the structure , and \$ 8.57 for his repair work.

In the estimate for the 1850-51 fiscal year Major Symington asked for \$ 645 "for building a bridge across the armory canal, explaining it would be used "To build a wooden bridge on stone piers, in the place of the old bridge, which is out of position, abutting immediately upon the workshops, and over which all domestic supplies, for those living upon the [upper part of the Hall] island, have to pass. The new position for the bridge is above the workshops, so as to admit of the armory yard being properly enclosed."

5. National Archives Record Group 217, 3rd Series, File 630, Voucher 59, dated December 30, 1843, to William Newton.

6. Serial No. 568, Document No. 4, pp. 156, 157, item No. 9.

The money for the new bridge was appropriated on September 28, 1850.

A total of \$ 1,746.48 was expended on construction of the Shenandoah Canal at the Rifle Factory in 1851 and of this amount \$ 818.98 went to erect the new bridge.

Edward Tearney had the bridge abutments in place by June 30, 1851, and received \$ 703.98 for the following construction on the "new bridge across the canal at Rifle Factory:"

\$ 37.86 for 126 6/27 cubic yards of earth excavation @ 30c.
 319.69 for erecting 182 17/25 perches mortar masonry @ \$ 1.75.
 154.98 for erecting 103 8/25 perches mortar masonry @ \$ 1.50.
 191.35 for 793 11/27 cubic yards of earth filled in and graded @ 25c.
\$ 703.98 (7)

In the annual report for the fiscal year ending June 30, 1851, Superintendent Symington remarked of this work: "Two abutments of masonry, with wing walls, for a bridge over the canal (at the rifle factory), have been erected, together with considerable filling in, rendered necessary by the improvement." 8

In July 1851, master carpenter Jeremiah Fuss constructed the wooden superstructure of bridge over the Shenandoah Canal and received \$ 115.00 for this work. 9 Col. Benjamin Huger described the bridge in his annual report for the fiscal year ending June 30, 1852 as follows:

"A new bridge, 32 feet span, 12 feet wide, has been constructed over the (rifle factory) canal to the workshops." 10 In 1856, "The wooden bridge across the canal" was "weather-boarded and the frame covered to protect it from the weather." 11

Accurate drawings showing the stone arched bridge and the wooden bridge to the Hall Islands are Harpers Ferry NHP Negatives Nos. HF- 794, a drawing made by Lt. James G. Benton, U.S. Army, about 1853, and HF-490, a lithograph that

6A. U.S. Statues at Large, IX, p.507.

7. 3rd S., F. 12680, V. 54, September 30, 1851, for \$ 703.98.
8. Serial No. 611, Document No. 1, p. 459. Item 9.
9. 3rd S., F. 12680, V. 10, August 6, 1851, for \$ 115.00.
10. Serial No. 659, Document No. 1, p. 254, item No. 11.

11. Superintendent Henry W. Clowe's annual report for the fiscal year ending June 30, 1856, Serial No. 876, p.389.

was published in 1857. Photograph HF-37, taken May 22, 1865, also shows the two bridges.

Archeologist Edward McMillan Larrabee, during his exploratory investigation of the Lower Hall Island in 1961, located the Island side abutment and wing walls of the lower bridge to the Lower Island, probably the stone arched ¹² bridge that was erected in 1820. The wooden bridge, with stone abutments, constructed in 1851 by Edward Tearney and Jeremiah Fuss, was probably the upper bridge, leading to the Armory Dwelling houses located on the Upper Hall Island.

12. Larrabee, Edward McMillan, "Report of the Third Season of Exploratory Archeological Excavations Conducted at the U.S. Rifle Works, Lower Hall Island, Harpers Ferry National Monument, Harpers Ferry, West Virginia, from August 25 to November 10, 1961 (N.P.S. typescript, Harpers Ferry NM, W. Va., April 20, 1962), pp 48-49. The maximum width of this abutment was found to be 20 feet and the minimum about 15 feet.

CHAPTER VIIThe U.S. SHENANDOAH DAM, 1808 - 1841:1. The Shenandoah Dam, 1808- 1821:

From 1808-1809 to 1821, the U.S. Armory had three shops with water wheels operating on the Lower Hall Island. No evidence has been found to indicate that the Armory had constructed a dam on the Shenandoah during these years to provide water for the shops. The water was apparently drawn from the Shenandoah Canal.

2. The Shenandoah Dam. 1822- 29:

From 1822 to 1829 a total of approximately \$ 420.50 was spent for repair and construction on the Shenandoah Dam (see Chart I below). The main work was done in 1825 at a cost of \$ 391.50, when mason John McNulty and carpenter John Lowstetter erected 358 perches of stone walls for the lock walls and dam on the Shenandoah and also made a new pair of lock gates for upper lock of that canal. (1)

CHART I - 1825-27

Work on the Shenandoah Canal, Dam, and Locks: 1825-27:

File No.	Vouc. No.	Artisan	Date	Amount	Remarks
9310	122A	John McNulty	9/16/25	\$ 366.50	For mason work, quarrying & boating 358 perches of stone for lock walls and dam on Shenandoah= \$ 179.00; For 125 days mason work laying stone= \$ 187.50.
9310	21A	John Lowstetter	8/12/25	\$ 25.00	For making a new pair of guard gates at head of canal on the Shenandoah River.
Total:			1825:	\$ 391.50	
11622	213B	John Rockenbaugh	7/31/27	\$ 29.00	For 29 days work repairing the Shenandoah dam.
Total:			1825-27	\$ 420.50	

(1) Perch, a unit of measure for stone, a solid measure 16½ feet by 1½ feet by 1 feet.

Armory Expenditures on
the U.S. Shenandoah Dam, 1822 - 1829

Year:	Shenandoah Dam
1822	-
1823	
1824	
1825	\$ 391.50
1826	
1827	29.00
1828	
1829	
TOTAL:	\$ 420.50

In 1827 the United States entered into a second contract with Captain John H. Hall to produce more of his patent rifles. This agreement resulted in the expansion of his plant on the Lower Hall Island and to the need to ensure a more adequate supply of water for his operations.

John H. Hall informed Colonel George Bomford on July 18, 1831, that the existing U.S. dams on the Shenandoah river were poorly constructed of wood and loose stone, filled with brush, and required frequent repairs. These were temporary structures and in very poor condition. The increased operations of the Rifle Factory would require a better dam to supply an increased amount of water. Hall suggested that the new dam be constructed a few yards below the existing ones and that the new structure, which would consist of timbers bolted to stone, should be three feet high and extend obliquely up the river about 1,000 feet. He estimated the cost of construction at \$ 3,000.00.¹ Col. Bomford authorized Superintendent George Rust, Jr., to build the Shenandoah Dam on August 18, 1831.² By September 5, Hall discovered that the new dam would have to be continued all the way across the river in order to insure a full supply of water for the rifle factory during dry seasons. Hall estimated that this addition was cost \$ 500, thus bringing the total cost of the new structure to approximately \$ 3,500.00.³

As the new U.S. dam began to cross the Shenandoah, John Strider, whose mill was located above(or west) of the rifle factory, alledged that he owned the water rights for this section of the river and charged that the United States was infringing his rights with the new dam. This apparently stopped construction on the new dam.

In 1833 Colonel Bomford requested and Congress appropriated on March 2, 1833 the sum of \$ 4,600 to "purchase right to water power on the Shenandoah River for the use of the U.S. Rifle Factory."⁴

-
1. Hall to Bomford, July 18, 1831, Reel 22, Vol. 11, p.1055.
 2. Bomford to Rust, August 18, 1831, Reel 14, V. 9, p.826.
 3. Hall to Bomford, September 5, 1831, Reel 22, V.11, p.1083;
Hall to Bomford, October 25, 1831, Reel 22, V. 11, 1076.
 4. Reel 20, Vol. 6, p.580- in National Archives R.G. 156, Entry 129, Vol. I, p. 115! Appropriation in U.S. Statutes at Large, IV, 642.

Strider sold his rights to the water power of the Shenandoah to the United States on June 27, 1833 for \$ 2,600.00, and the balance of the \$ 4,600.00 appropriation- \$ 2,000 reverted to the general Treasury.⁵ In this deed Strider gave to the United States: "the use and privilege(Sic) of the waters of the Shenandoah river between the mills of said Strider called Gulph mills and the public works belonging to the United States on said river below the fall in the river from said mills to the termination of the land of said Strider being Two feet Three inches, commencing Two feet five inches below the top of an iron bar now inserted in a rock, situated in the tail race of the mill of said Strider; said bar being twenty three feet six inches distant from the south corner of said mill...."

Strider further granted to the U.S. the

"the privilege of completing and perfecting the dams now extending partly across the Shenandoah River, above and nearly opposite the said Gulph mills, so as to increase the supply of water to any extent, passing down the canal that leads to the Rifle Factory; also the privilege of increasing the depth and width of the present canal, extending from the dam last mentioned past the mills of said Strider to the Rifle Factory; also the privilege of increasing and extending the dam or dams at the head of the canal or race which supplies the mills of said Strider with water, and of increasing the depth and width of said canal or race, and of constructing wastewiers in the same, at such places as may be considered necessary by the Superintendent of the Harpers Ferry Armory... 6

5. Deed of M. & S., June 27, 1833, Deed book 18, pp. 431-432, Jefferson County Courthouse, Charlestown W. Va., Also copy on National Archives Record Group 121, Public Buildings Service, Entry 75.
6. Ibid.

In the special estimates for 1834, the Ordnance Department requested
and Congress appropriated on May 14, 1834, the sum of \$ 2,000

"for repairing dam and removing obstructions in way of supplying water to
rifle factory on the Shenandoah River." 7

Col. Bomford explained the need for these funds, writing:

The water in the canal that supplies the works on the Shenandoah
river, becomes so much lowered every day, that the operations at the
rifle factory have to be partly discontinued every few hours. These
obstructions are caused by masses of rock, and accumulation of mud and
gravel in the Shenandoah river, which are required to be removed in
order to insure a regular supply of water at these works..." 8

The Armory Accounts show that the sum of \$ 1,999.50 was expended
during 1834 in executing and completing this project. 9

The Paymaster's vouchers reveal that Lewis Wernwag constructed the
Shenandoah Dam in August and September 1834, placing 739 cubic yards
of rock and 1,962 cubic yards of gravel in the "breast work" at the dam.

Wernwag did his work and was paid as follows:

August 21, 1834-

For Excavating rock below water and constructing breast work at dam, 133 cubic yards of rock.....	\$ \$ 292.60
For excavating from above water and constructing breast work, 120 cubic yards of rock.....	90.00
Excavating and placing on breastwork 739 cubic yards of gravel..	258.65
Aug. 21: 253 cubic yds rock, 739 cubic yds gravel-	\$ 641.25

August 29, 1834:

Excavating rock below water & constructing B.W., 333 cu. yds.	732.60
Excavating from above water " " " " 69½ " "	52.12
For 669 cubic yards of gravel @ 35c per cub. yd.....	212.45
Aug. 29, 1834: For 402½ cub. yds. rock, 669 cub. yds gravel..	\$ 997.17

7. Estimates for 1834, Reel 20, Vol. 6, p. 583, -National Archives R.G. 156, Entry 129, Vol. I, p. 125. Appropriation in U.S. Statutes at Large, IV, p. 675.
8. Estimates for 1834, Reel 20, Vol. 6, p. 585.
9. Serial No. 287, Document 44, p. 366.; Also Serial No. 273, Document 112, p. 5.

September 10, 1834:

For excavating rock below water & constructing breast work at dam, 28 $\frac{1}{2}$ cubic yards of rock.....	\$ 62.15
For excavating 55 $\frac{2}{3}$ cubic yards above water, &c.....	57.43
For 554 cubic yards of gravel on dam.....	179.90
For waste weir.....	61.60
Sept. 10, 1834: 84 cub.yds rock; 554 cub.yds.gravel.....	\$ 361.08

Total to Lewis Wernwag for work on dam: \$ 1,999.50, for 739 ¹⁰ cubic
yards of rock and 1,962 cubic yards of gravel.

Repair and Improvements to the U.S. Shenandoah Dam., 1836-41:

The records of the Armory Paymaster indicate that no major repair
or improvement work was done on the U.S. Dam on the Shenandoah
River during the years 1836 to 1841.

10. R.G. 217-1st series- File 19021-Abstract F, 3rd quarter of 1834.

Expenditures on the U.S. Shenandoah Dam,
1830 - 1841

Year	Dam	
1830		
1831+		
1832		
1833*	2,600.00	(1)
1834	1,999.50	
1835		
1836	0	
1837	0	
1838	0	
1839	0	
1840	0	
1841	0	
Total:	\$ 4,599.50	

(1) for purchase of water power rights.

1. Rifle Factory Dam on the Shenandoah 1842 to 1844:

The vouchers of the Armory paymaster indicate that no work was done on the Rifle Factory dam during the years 1842 to 1844.

2. U.S. Shenandoah Dam for Rifle Factory, 1845 - 1851:

On December 27, 1845, S. D. McMurphy was paid \$ 244.21 for¹ "furnishing material and erecting 137 perches of heavy stone wall on the dam in the Shenandoah river at the Rifle Factory." In his annual report for the fiscal year ending June 30, 1846, Superintendent John Symington reported: "Dam on the Shenandoah River repaired by 137 perches of stone to improve the head of water."²

In the annual estimate for the 1846-47 fiscal year, Major Symington asked for \$ 900.00 for "new water dam at rifle Factory," explaining:

"The position of the present waste dam is altogether bad; another should be made."³ The requested amount was appropriated on August 8, 1846.⁴

Money for building the new waste dam was apparently spent during the period July 1, 1847 to December 31, 1848, the period where the Armory Paymaster's vouchers are missing from the National Archives Record Group 217 files. There are thus no details available regarding cost, amount of materials, and who built the new waste dam, which was probably related also to the construction of the new main tail race at the rifle factory.

1. 3rd Series, F 3122, V., 59, December 27-1845, for \$ 244.21.
2. Serial No. 482, Document No. 1, p. 164, item No. 8.
3. Serial No. 481, Document No. 9, p. 111, 112, item No. 18.
4. U.S. Statues at Large, IX, p. 69.

Recorded Expenditures, U.S. Rifle Factory Dam, 1842-51:

Year	Shenandoah Dam
1842	0
1843	0
1844	0
1845	244.21
1846	0
1847	0
1848	(900.00)
1849	0
1850	0
1851	0
Total	1,144.21
Approp- riated	900.00 (1)

(1) Money appropriated August 8, 1846.

3. The U.S. Rifle Factory Dam on the Shenandoah, 1852-54.

The annual reports of operations of the superintendent for the fiscal years ending June 30, 1853 and 1854, make no mention of any repairs or construction being made to the Rifle Factory dam. ⁵

4. U.S. Rifle Factory Dam on the Shenandoah, 1855-61:

On March 3, 1855 Congress appropriated \$ 3,505.00 "for repairs of canal embankment walls...., and of the canal and dams at the rifle factory. ⁶ It was explained to Congress that "these canal walls and embankments were principally injured by the great flood of [April] 1852, also, in some degree, by heavy rains of the last two years..." ⁷

This money went chiefly to make repairs to the canal walls and canal at the rifle factory in 1855-56, and the repair made to the U.S. Rifle ^{dam} Factory were apparently so minor that the superintendent of the armory, Henry W. Clowe failed to describe them in his annual report for the fiscal year ending June 30, 1856, although the work on the canal is given at some length. ⁸

5. Serial No. 692, Document No. 1, p.278; Serial No. 747, p.362.

6. U.S. Statues at Large, X, 637.

7. Estimates for the 1855-56 fiscal year, Serial No. 781, Document 3, p. 238, Item No.2.

8. Serial No. 876, p.390.

APPROPRIATIONS FOR THE U.S. SHENANDOAH DAM,
1852 - 1861:

Y. M. D. :	Shenandoah Dam
8/31 1852	0
3/3/ 1853	0
8/5/ 1854	0
3/3/ 1855	0
8/30/ 1856	0
3/7/ 1857	0
6/17/ 1858	0
3/3/ 1859	0
6/31/ 1860	0
3/2/ 1861	0
-----	0
TOTAL.	

5. The Virginuis Island Shenandoah Dam and the Lower Hall
Rifle Factory Shops, 1850 - 1856.

In 1850 the Harpers Ferry and Shenandoah Manufacturing Company, the owners of the Island of Virginuis, constructed a dam across the Shenandoah River and also a new river wall, with inner and outer basins, as is shown on Major John Symington's revisions of 1851 to S. Howell Brown's 1848 Map of Harper's Ferry, for the purpose of supplying increased amounts of water to the two large brick cotton factories that the company had¹ erected in 1846-49.

The backwater from the new Virginuis Island dam caused problems for some of the water wheels or turbines in the U.S. Rifle Factory Shops on the Lower Hall Island. The two six feet in diameter turbines in the Rifle Factory Finishing and Machine Shop, Bldg. No. 3, were effected in particular. In the estimates for the 1856-57 fiscal year Superintendent Henry W. Clowe accordingly requested the appropriation of \$ 2,050.00

" for water-wheel, penstock and pit-gearings, for ² new finishing shop at the rifle factory." The reason given to explain the need for changing the two new turbines with a single undershot wheel was as follows:

1. Brigadier General George Talcott, Chief of Ordnance, to Major John Symington, January 11, 1851, Reel 19, V.5, p.444. Armory Superintendent Symington to Talcott, January 15, 1851, Reel 24, V.3, pp. 287-288.

2. Serial No. '865, Document ,p. 245, item No. 12.

The two turbine wheels now in use in this shop were placed so low in the pit, that it is difficult to make the necessary repairs when required; at some seasons of the year they cannot be made at all. Should any accident happen during the winter, or in the sickly season during the summer, the exposure of the health of the workman incident to the repairs, would be such as to preclude to a great extent and perhaps entirely its accomplishment with reasonable cost. All this being occasioned by back-water rising from the dam across the Shenandoah river, erected by the Harpers Ferry and Shenandoah Manufacturing Company in connexion with the deep position of the turbine wheels, which back water is liable to stop the works for necessary repairs for two or three weeks at a time. It is proposed to substitute for these a new undershot wheel with cutstone head blocks, cast iron frame, fitted, framed and erected upon the most approved plan.

3

4 Congress appropriated the requested \$ 2,050.00 on August 30, 1856.

The replacing of the water wheel was accomplished before the money was provided, for in his annual report of the year ending June 30, 1856, Superintendent Henry W. Clowe reported:

Two of the old water-wheels (at the Rifle Factory) have been removed, and their places supplied by one undershot wheel, 10 feet in diameter and 12 feet wide, designed to perform the service lately performed by the two old ones. This wheel is of wood, with cast-iron shaft, flanches "L" irons and pillow blocks, secured with wrought-iron bolts and nuts. It has two master-wheels of cast iron, 10-feet diameter and 8-inch face. The whole is supported by two cut-stone head blocks 12 feet long, 5½ feet wide, and 6 feet high, cemented. The penstock is cast-iron frame, 21 feet long, 3 feet wide, and 3 feet high, the planking being secured by bolts and nuts, with cast-iron gates, racks, pinions, &c., the whole resting on a solid stone bed or wall, grouted and cemented. This wheel drives the machinery in the new finishing shop, and very considerable improvements have been made in the main driving drums, shafts, pillow and head blocks of the same shop.

5.

This apparently solved the problem, for no further mention was made of backwater problems from 1856 to 1861.

3. Serial No. 865, p.247, Item No.12.

4. U.S. Statues at Large, XI, p. 150.

5. Serial No.876pp.390.

6. EXPENDITURES ON THE U.S. SHENANDOAH CANAL
AND DAM, 1822 - 1861

Years:	Bridges & Canal	Dam	Total
1822-29:	\$ 2,833.33	\$ 420.50	\$ 3,253.83
1830-41:	207.18	4,599.50	4,806.68
1842-51:	2,045.49	1,144.21	3,189.70
1852-61:(1)	10,505.00	0	10,505.00
TOTAL:	\$ 15,590.90	\$ 6,164.21	\$ 21,755.11 (2)

(1). Total appropriated 1852 to June 30, 1860 and probably spent.

(2) Total includes \$ 2,600 spent to purchase water power rights on the Shenandoah in 1833 in order to construct a better dam.

Manuscript Material:National Archives Records, Washington, D.C.

The Confederate Army on April 19, 1861 captured the U.S. Armory at Harper's Ferry and held the place until June 15, 1861. On their withdrawal on the latter date, they set fire to the U.S. Musket Factory buildings and thereby destroyed all of the original records at the Armory, which were on file in Musket Factory Bldg. No. 2, the Armory Offices. For this reason there is no collection of Harper's Ferry Armory records as such on file in the National Archives at Washington, D.C.

The originals of letters written by Harpers Ferry Armory Officers from 1798 to 1861 to the Secretary of War and Chief of Ordnance are still largely intact in the National Archives, but they are filed as they were received, when written, in the general filing systems of the Washington official.

In 1957, Park Historian Herbert L. Kissling and Charles W. Snell, during a six week period, searched most of the central files in the National Archives for material relating to the history of the Harper's Ferry Armory from 1794 to 1869. Collected were 14,504 pages of documents on 14 reels of microfilm and 225 pages of photostated documents. Map, plans, prints and photographs in the National Archives collections relating to Harpers Ferry were also copied. Historians Kissling and Snell, in effect, thus recreated much the central Armory files that were destroyed in 1861.

The microfilm material was reproduced in the form of ex rox pages and these were placed in loose leaf notebooks. These volumes and their pages were numbered and completely cataloged and indexed according to subject and these notes placed in a master card index system.

All persons interested in performing research on the Harpers Ferry Armory history from 1794 to 1869 would therefore do well to first examine this extensive centralized collection in Harpers Ferry National Park library to collect their data, and only then, if there are still some missing links, to attempt to located these items in the general files of the National Archives, Washington, D.C.

The following National Archives Record Groups were searched and data relating to Harpers Ferry collected in 1957:

1. Records of the Bureau of the Census: Population Schedules of the Census of the United States for the Years 1810 to 1870, for the towns of Harper's Ferry, Bolivar, and Virginus Island. National Archives Record Group 29 (274 pp. on one reel of microfilm in Park Library).
2. Records of the Office of the Chief of Engineers, National Archives Record Group No. 77 (Maps and reports relating to right of way for the Winchester and Potomac Railroad, 1834).
3. Records of the National Park Service, National Archives Record Group No. 79(Maps and reports of C. & O. and Shenandoah Canal Companies for constructing canal and locks on Shenandoah in 1803-1807.)
4. Records of the Office of the Quartermaster General, National Archives Record Group No. 92 (Civil War activities, 1861-66).

5. Records of the Adjutant General's Office, National Archives Record Group No. 94. (Civil War).
6. Records of the Office of the Secretary of War, National Archives No. 107 (1794-1869).
7. Records of the Public Buildings Service, National Archives Record Group No. 121 (1796-1887 records of the purchase of land for U.S. Armory use, and also of the sale of U.S. lots and houses, 1852, and 1869-1887.).
8. Records of the Office of the Judge Advocate General, National Archives Record Group No. 153. (Records and copies of deeds for the purchase of Armory lands and the sale of the same, 1796 - 1887).
9. Records of the Chief of Ordnance, National Archives Record Group No. 156. This Office or Department was responsible, under the supervision of the Secretary of War, for the operations of the Harper's Ferry Armory, 1815 to 1887).
10. Records of the Office of the Inspector General, National Archives Record Group No. 159. Has many inspection reports written after inspections had been made of the Harper's Ferry Armory.

Records of the U.S. Treasury Department and the U.S. General Accounting Office, The records of the Second Auditor of the Treasury, National Archives Record Group No. 217, Series Two and Three, 1817 to 1851:

This data is comprised of thousands of pages of documents that were prepared and submitted by the Harpers Ferry Paymasters for paying wages, for purchase of materials for manufacturing arms and for construction of buildings, dams, and canals. It includes armory pay rolls and rent rolls.

This vast collection was searched by Historian Charles W. Snell for data relating to the repair and improvements of the Harper's Ferry Armory from 1817 to 1851. Records for the years 1852 to 1861 were destroyed by the National Archives staff during the 1940's in order to save space.

Historian Snell's long hand notes, taken during June 1980, have been typed up and are available for study in the Harpers Ferry National Historical Park Library in the following typescript reports:

Snell, Charles W., compiler, "Extracts from National Archives Record Group 217, Records of the U.S. Treasury Department, The Records of the Second Auditor, 1817-1841, Relating to the U.S. Armory at Harper's Ferry, during the Years 1817 to 1841 for Repairs and Improvements of the Physical Plant." Two Volumes. Vol. I, 1817-1829; and Vol. II, 1830-1841, 337 pages. (June 1980)

Snell, Charles W., "Extracts from National Archives Record Group 217, Records of the Second Auditor, Second and Third Series, U.S. Treasury Department, relating to Expenditures for Repairs and Improvements at the U.S. Armory at Harper's Ferry, Virginia, during the Years 1842 to 1842." (Typescript, October, 1980), Volume III, 259 pp.

Published U.S. Documents:

1. American State Papers- Class V, Military Affairs(7 volumes, Washington, D.C., 1832-1850) Includes some correspondence of the Secretary of War, Ordnance Office, and Armory Superintendents. Many estimates and reports, for period 1793 to 1837.

All data relating to the U.S. Armories at Harper's Ferry, Virginia, and Springfield, Massachusetts, in these seven volumes was xeroxed by Historian Charles W. Snell in January 1980 and copies of the following report provided to the libraries of both parks:

Snell, Charles W., Compiler, "Data for Operations Histories of the United States Armories at Harper's Ferry, Virginia, and Springfield; Massachusetts, 1793 to September 30, 1837, compiled from American State Papers(7 volumes)," (National Capital Team, Denver Service Center, January 1980), 298 pp. in two Volumes. Vol.I(1793- 1828); Volume II, 1829-1837.)

2. The Serial Number of Public Documents of the United States published by the U.S. Congress, 1817- 1861:

This series, comprised of official reports prepared by executive departments and submitted to Congress and also of reports and correspondence of Congress, was published annually for the U.S. Congress, beginning in 1817. About 1,100 volumes cover the years from 1817 to 1861.

Most of the data relating to the U.S. Armories at Harper's Ferry and Springfield during the years 1817-1861 was xeroxed by Historian Snell in 1979 and copies of the following report provided to the libraries of both Parks:

Snell, Charles W. Snell, compiler, "Extracts from the Public Documents of the United States relating to the Operations and History of the National Armories, 1795 -1860, at Harper's Ferry and Springfield, Published by the U.S. Congress, 1817 -1861, in its Serial Serial(National Capital Team, Denver Service Center, January 1980), 701 pages, in four Volumes. Vol. I, 1795-1834; Vol. II, 1835-1841; Vol. III, 1842-1851; and Vol. IV, 1852- 1861.

3. Serial Number of Public Document of the United States, published by the U.S. Congress, 1866- 1887 :

The Congressional Serial Number series also contains correspondence and reports, 1867-1885, relating to the sale and disposal of U.S. Armory lands at Harpers Ferry, West Virginia. This data was xeroxed by Historian Charles W. Snell and copies of the following report provided the Harpers Ferry National Historical Park Library:

Snell, Charles W., Compiler, "U.S. Documents relating to the Disposal of U.S. Armory Lands at Harper's Ferry, West Virginia, 1867-1885," Volume III, 151 pages, of the three Volume study-"The Acquisition and Disposal of Public Lands at the U.S. Armory at Harper's Ferry, Virginia, 1796 - 1885," (National Capital Team, Denver Service Center, December 1979).

4. Benet, Stephen V. ed. and compiler, A Collection of Annual Reports and Other Important Papers, Relating to the Ordnance Department, Taken from the Records of the Chief of Ordnance, from Public Documents, and from other Sources:(4 vols, Washington, D.C., 1878 - 1890).

A rare book; Historian Charles W. Snell xeroxed 79 pages from this set and proved the Harpers Ferry National Historical Park Library with copies in one volume in January 1980.

5. Virginia Free Press, Charles Town, Virginia, 1824-1861: A weekly newspaper publishing Jefferson County news, 1824 to 1861. Available for use in Harpers Ferry National Historical Park Library on microfilm, nine reels.
6. The Spirit of Jefferson, Charles Town, West Virginia, 1865-1955: A weekly newspaper publishing Jefferson County news, 1865-1955. Available for study in Harpers Ferry National Historical Park library on 34 reels of microfilm. This set acquired in 1980.
7. U.S. Statutes at Large, Volumes I to XII, contain laws, resolutions, and appropriations for the Harpers Ferry Armory, 1794 to 1861.
8. Registry of Deeds for Jefferson County, County Court House, Charles Town, West Virginia. His deeds and land records from about 1800 to date.
9. Noffsinger, James P., "Harpers Ferry, West Virginia- Contributions Towards a Physical History," NPS typescript, Eastern Office of Design and Construction, Philadelphia, Pennsylvania, November 1958), 278 pp.
- Has a 54 page general narrative history of Harpers Ferry, 1719-1953; pp. 55- 278 comprised of 36 documents transcribed from National Archives Records and copies of 12 historical maps (parts of) and 10 19th century photographs of Harpers Ferry.

Books:

1. Barry, Joseph, The Strange Story of Harper's Ferry (1st printed in 1903; 3rd edition, Shepherstown, W.Va. 1959).

A school teacher, Barry was born and raised at Harper's Ferry; he was a boy prior to the Civil War and his history is usually accurate.

2. Smith, Merritt Roe, Harpers Ferry Armory and the New Technology - The Challenge of Change (Cornell University Press, Ithaca and London, 1977).

A excellent history of the development and production of small arms at the Harpers Ferry Armory, 1796 - 1861. Dr. Smith made very extensive use of the thousands of pages of documents collected in the Harpers Ferry National Historical Park library as well as of material in the National Archives at Washington, D.C.

U.S. Rifle Factory on the Shenandoah, Upper and Lower Hall Islands:

- Carson, Hamilton H., "Resistivity and Seismic Surveys and Excavations, U.S. Rifle Works, Harpers Ferry, West Virginia," 23 pp. typescript, illustrations and notes, March 1963.
- Larrabee, Edward McMillan, "Report of Exploratory Excavations conducted on the Lower Hall Island Rifle Factory, Harpers Ferry National Monument, Harpers Ferry, West Virginia from August 25 through August 29, 1959," (Typescript, N.P.S., June 20, 1960), 8 pp., 3 photos, 1 plan..
- Larrabee, Edward McMillan, "Report of the Second Season of Exploratory Archeological Excavations at the U.S. Rifle Works, Lower Hall Island, Harpers Ferry National Monument, Harpers Ferry, West Virginia, from June 23 through July 6, 1960 (N.P.S. typewscript, January 30, 1961), 37 pages, 11 plates, and 3 drawings.
- Larrabee, Edward McMillan, "Report of the Third Season of Exploratory Archeological Excavations Conducted at the U.S. Rifle Works, Lower Hall Island, Harpers Ferry National Monument, Harpers Ferry, West Virginia, From 25 August through 10 November 1961," (for Harpers Ferry NM, April 20, 1962), 90 pp., 13 plates, 6 drawings.
- Smith, Philip R., "Historic Building Site Survey Report-History of the Upper Hall Island, 1796-1884," (Harpers Ferry NM, February 19, 1959) 21 pp., six maps.
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- Smith, Philip R., "Historic Building Site Survey Report: History of the Lower Hall Island, The Rifle Factory, 1844-1884," (Harpers Ferry NM, March 2, 1959), 47 pages, 9 maps and 4 photos.
- Smith, Philip R., "Historic Building Site Survey Report: History of the Lower Hall Island, 1796-1848, and Captain John H. Hall's Rifle Factory, 1819-1845," (Harpers Ferry NM, May 27, 1959, 37 pages, 6 maps.
- Snell, Charles W., " A Physical History of the Plant of the U.S. Armory, at Harper's Ferry, Virginia, Its Evolution, Development, Reconstruction, Destruction, and Disposal, 1794 to 1885," (N.P.S. Typescript, National Capital Team, Denver Service Center), three Volumes.
Vol. I, 1794 - 1841, 566 pp.
Vol. II, 1842- 1851, 364 pp.
Vol. III, 1852 -1885, 406 pp.

Island of Virginus:

- Hannah, David Hardgrave, "Archeological Excavations on Virginus Island,--Harpers Ferry National Historical Park, 1966-1968," (Harpers Ferry Job Corps Civilian Conservation Center, Harpers Ferry, W. Va., March 1969), 151 pages. 89 photos and plans.
- Snell, Charles W., "History of the Island of Virginus, 1751-1870," (NPS, Harpers Ferry NM, December 4, 1958), 166 pages, 20 maps, 10 photos. HD-29A.
- Snell, Charles W., "A Short History of the Island of Virginus, 1816-1870," (NPS. Harpers Ferry NM, dated June 1, 1859), 69 pages, 18 photos, 5 maps. HF-29B.

APPENDIX NO. 11806 Right of Way for Canal

Harpers Ferry National Historical
Park Microfilm Collection, Reel 1 No.
22, Vol. 13, pp. 1265-1267. From
National Archives Record Group 153,
Office of Judge Advocate General,
Military Reservation Division, 1809-1942,
Harpers Ferry, W.Va., Box No. 44.

Articles of Agreement made and
entered into the third day of March

in the Year of our Lord One thousand Eight-Hundred and Six. Between Thomas Jefferson, President of the United States, on the one part for and in their behalf & the president and Directors of the Potomac Company on the other part. Witnesseth that whereas the said Company are anxious to Improve the Navigation of the River Shenandoah, by means of a Canal to be taken out of said River upon the Grounds belonging to the U. States and Continued down to a point at or near the old Saw Mill upon the Said grounds, where it is proposed to descend by means of Locks into the bed of the River. In consideration whereof they agreed that the U. States may have the full use and benefit of the Surplus Water in Said Canal - - The said Thomas Jefferson President as afore said Hath and Doth hereby grant to the Said Company the Right and privilege of cutting making and Keeping in Repair at their own proper and exclusive expence a Canal through the Said land belonging to the United States, and in ~~such manner~~ and direction as will take the water out of the Shenandoah River and Convey the Same to a point at or Near the old Saw Mill where their Locks may be inserted to descend again into the bed of the River - And the Said Thomas Jefferson in his said Capacity doth hereby further grant to the Said Company for the purposes aforesaid and as necessary for their Accomplishment the Right and privilege of digging and taking Stone Rocks and gravel from Such parts of the public land as Shall not be injurious to the United States; and also the Right of making keeping in Repair and using Suitable towing paths and passages on the banks of the said Canal though the whole extent aforesaid, together with the use and occupancy at all times of a sufficient Space of Ground on each side of the Locks as shall be proper for a Toll house and other necessary uses of Said Locks and the Said president and Directors in consideration of the premises do again and covenant with the U. States as aforesaid that they the Said Company or their assigns will make and Keep in Repair the proposed Canal, and do hereby grant unto the United States as aforesaid forever here after the Right and privilege of drawing Water from any part or parts of Said Canal for the use of any Water Works which may hereafter be erected on any part of the public lands, So far as may consist with the free complete and uninterrupted use of the Said Canal, by the Said Company, and the Said Company doth further agree as aforesaid with the United States to cause to be made and kept in repair such Roads and bridges as may be deemed necessary and proper by the Superintendant of the

Public Works at Harpers Ferry to remedy any inconvenience which the U.S. may sustain in consequence of the interruption which the proposed Canal and Locks may Accation (sic) to the existing road or way -

The said president and directors of the Potomac Company having a complete knowledge of the nature and extent of the title which the United States claim to the Land through which the aforesaid Canal is intended to pass, it is hereby Clearly understood and further agreed by the parties hereto, that the said Thomas Jefferson, Pres! as aforesaid only intends to pass to the said Company such right and such only as the United States Claims as are invested with invested with, not meaning to warrant or defend the same, or to subject the United States to any damage or liability whatso ever in Case their title to the Same shall hereafter prove defective.

Signed Thos Jefferson

U.S. Seal By the President
of the U. States
H. Dearborn
Sec. of War

Signed Jos. Brown
for P. Company

True copy, 3, Nov. 1815.

APPENDIX 2

Deed, John Strider and Others, to the United States, June 27, 1633, for water power rights on the Shenandoah River. National Archives record Group No. 121, Public Buildings Service, Entry 75.

"This Indenture made this twenty seventh day of June, in the year of our Lord One Thousand Eight Hundred and thirty three Between John Strider and Sarah his wife of the County of Jefferson and State of Virginia of the one part, and the United States of America by the Hon. Lewis Cass, Secretary of War of the other part, Witnesseth that the said John Strider and Sarah his wife for an in consideration of the sum of Two Thousand Six hundred Dollars, lawful money of the United States to them in hand paid by the said United States of America (through the Hon. Lewis Cass Secretary of War), at and before the enscalling and delivery here of the receipt whereof is hereby acknowledged, Have Granted, Bargained, and sold, aliened, enfeoffed, released and confirmed, and by these presents do grant, Bargain & sell alien, enfeoff, release, and confirm unto the United States of America and their assigns forever all the right, title, interest claim and demand whatsoever of the said John Strider, and Sarah his wife, of, and to the use and privilege /sic,/ of the waters of the Shenandoah river between the mills of the said Strider called the Gulph Mills, and the public works belonging to the United States on said river below the fall in the river from the said mills to the termination of the land of said Strider being Two feet Three inches, commencing Two feet five inches below the top of an iron bar now inserted in a rock, situated in the tail race of the mill of said Strider; said bar being twenty three feet six inches distant from the south corner of said mill. The said John Strider and Sarah his wife for the consideration before mentioned grant, bargain, and sell unto the United States of America the privilege /sic,/ of completing and perfecting the dams now extending partly across the Shenandoah river, above and nearly opposite the said Gulph Mills, so as to increase the supply of water to any extent, passing down the canal that leads to the Rifle Factory; also the privilege /sic,/ of increasing the depth and width of the present canal, extending from the dams last mentioned past the mills of said Strider to the Rifle Factory; also the privilege /sic,/ of increasing and extending the dam or dams at the head of the canal or race which supplies the mills of said Strider with water, and of increasing the depth and width of said canal or race, and of constructing waterworks /sic,/ in the same, at such places as may be considered necessary by the Superintendent of the Harpers ferry Armory, his successor, or any future agent of the United States, for obtaining water

for the public works now established, or which may hereafter be established by the United States at, or near, the Rifle Factory on the Shenandoah river; provided however that such waterworks /sic./ shall not be so constructed as to prevent the free passage to the mills of said Strider of whatever quantity of water he may require, without, however lessening the force or quantity of water required by the United States. And the said John Strider and Sarah his wife, for the consideration before mentioned, grant and convey to the United States of America and their assigns forever the privilege /sic./ of erecting a dam or dams, partly or entirely across the Shenandoah river at any point or points below the mills of said Strider, the height of which however, shall not be more than eight inches above the top of an iron bar now inserted in a rock, situated near the upper end of the Island on which the Rifle Factory is located, being the second rock of a ledge of rocks, extending from said Island nearly across the Shenandoah river in the direction of South $3\frac{1}{4}^{\circ}$ West: the said iron bar is inserted in said rock so that the top thereof is even with surface of the highest point of said rock, and in order to identify it the more particularly, the following bearings and distances have been ascertained, measuring from said bar, viz; to the inner angle of a large rock near the south margin of the Shenandoah river South 44° East; to the East Chimney of the dwelling house occupied by John H. Hall on Camp Hill North $65\frac{1}{4}^{\circ}$ East; to the East corner of the new stone addition to the dwelling house of said Strider South $42\frac{1}{4}^{\circ}$ West; to the East corner of stone building No. 8 /or 11 2/ attached to the Rifle Factory North $45\frac{1}{4}^{\circ}$ East distant Two hundred and forty seven feet; and to the East corner of the stone /sic./ building formerly belonging to Martha Harrington decd North $29\frac{1}{2}^{\circ}$ West Two hundred and twenty six feet. To Have and to hold the said use, privilege, /sic./ and enjoyment of the water power before mentioned hereby granted and conveyed unto the United States of America and their assigns forever. And the said John Strider and Sarah his wife, for themselves, their heirs, Executors, and Administrators, do hereby covenant and agree to warrant and defend the whole of the water power and the right of using it as aforementioned hereby granted and conveyed unto the United States of America, and their assigns forever free from the claim of them the said John Strider and Sarah his wife and from the claim or claims of every other person or persons whatsoever. And the said John Strider and Sarah his wife for the consideration before expressed, release & exonerate the United States from all claim whatever for the previous use of the water power hereby conveyed.

In Witness whereof the said John Strider and Sarah his wife have hereunto set their hands and affixed their seals the day and year first written.

John Strider LS
Sarah Strider LS

Jefferson County to wit:

We James B. Wager and Geo. B. Stephenson Justices of the peace for the County aforesaid in the State of Virginia do hereby certify that John Strider party to a certain deed bearing date on the 27th day of June 1833 and hereto annexed personally appeared before us in our County aforesaid and acknowledged the same to be his act and deed and desired us to certify the said acknowledgement to the Clerk of the County Court of Jefferson in order that the said deed may be recorded.

Given under our hands and seals this 27th day of June 1833.

James B. Wager LS
Geo. B. Stephenson LS

Jefferson County to wit:

We James B. Wager and Geo. B. Stephenson Justices of the peace for the County aforesaid in the State of Virginia do hereby certify that Sarah Strider the wife of John Strider parties to a certain deed bearing date on the 27th day of June 1833 and hereto annexed personally appeared before us in our county aforesaid and being examined by us privily and apart from her husband and having the deed aforesaid fully explained to her she the said Sarah acknowledged the same to be her act and deed and declared that she had willingly signed sealed and delivered the same and that she wished not to retract it.

Given under our hands and seals this 27th day of June 1833.

James B. Wager LS
Geo. B. Stephenson LS

APPENDIX 4

EVIDENCE FROM FORMER EMPLOYEES OF THE U.S. RIFLE
FACTORY AND THE VIRGINIUS ISLAND MILLS REGARDING THE WATER
POWER AND DAMS ON THE SHENANDOAH FROM 1850 to 1861.

1887

Data transcribed from The Savery Papers Collection in the
Harpers Ferry National Historical Park Library by Archeologist
David Hardgrave Hannah, 1969, from

Hannah, David Hardgrave, "Archeological Excavations on Virginius Island, Harpers-
Ferry National Historical Park, 1966-1968," (Harpers
Ferry Job Corps Civilian Conservation Center, Harpers
Ferry, W. Va., March 1969), 151 pages. 89 photos and
plans. pp. 129-133.

APPENDIX 4 COPY OF PERTINENT PAGES FROM THE COURT TRANSCRIPT OF
THE SUIT BETWEEN HARPERS FERRY MILL COMPANY AND THOMAS SAVERY ET AL..

The complete transcript of this suit is on file at Harpers Ferry
National Historical Park as part of the collection known as The Savery
Collection.

Certificate of Evidence and Argument of Counsel in case of	
Harper's Ferry Mill Company	In Circuit Court of the
vs.	United States for the
Thos. H. Savery and others	District of West Virginia:-

Presiding, His Honor John J. Jackson Judge of said court.

July 19/ 1887.

From page 23:

There may be a little repetition in some of these affidavits and
if Your Honor pleases I will read them:

"State of West Virginia,
Jefferson County, to-wit:

This the 24th day of June 1887 personally appears Jesse W. Graham,
before me George W. Graham, a Notary Public in and for the state and
County aforesaid, and makes oath and says that he is about sixty
years of age, that he has resided in Harper's Ferry W. Va. since the
year 1849, is well acquainted with the location of the properties known
as the Harpers Ferry Mill, the Hall's Rifle Works property formerly be-
longing to the government of the United States and the old Herr's mill
property. That the said Harpers Ferry mill was before the war known as
the Cotton Mill property where was operated a cotton mill possessing
about 175 horsepower, and the Wernwag's machine shop, situated on the
island of Virginus above the said Cotton mill property with about forty-
five to fifty horsepower, all of which said power, was derived from the
Shenandoah river. That the water supplying the said rifle works was
furnished by water drawn from the said river through a canal, but after
being used by the said rifle works was returned to the said river be-
fore reaching either the said machine shops or the said cotton mill or
the flour mill of the said Herr. That a dam to preserve the supply to
Herr's Mill was constructed and used by the owner of the said last
mentioned mill and of the island of Virginus, about 1850, of an ele-
vation about equal to the dam across the river belonging to said

Harper's Ferry Mill company. That the dam now constructed by the present operator Savery and others is at an elevation of between five and six feet above said dam. That the stages of water in the Shenandoah river varies according to the seasons, it being much lower and touching the lowest flow from the first June through the subsequent months to the first December annually. That affiant has often known during said low water season as above deposed, the flow of the said river to be insufficient, and at other times not more than sufficient to furnish the power needed by the said Wernwag machine shop and the said Cotton factory and Herr's Mill. That in the judgment of this affiant, should there be diverted from the said river and not returned to it the same amount of water-power used by the said Hall's Rifle Works during their operation, at the low stages of water of the said river and often during the said stages which frequently occur, the remaining water-power in the said river would be inadequate, for the operation of the said Harper's Ferry Mill and that of course any greater obstruction of power than that used as aforesaid by the said Rifle works would increase the difficulty and render still more useless the property of the said Harper's Ferry Mill Company. That in the affiant's opinion the effect of holding the water by the dam constructed by the said Savery hereinafter described would be to flood a considerable portion of the island of Virginus during a high stage of water of said river. That the affiant was at times employed by the Government of the United States in the said Rifle Works and was also an employee in the said Machine shops of Wernwag.

(Signed)

Jesse W. Graham

From page 25:

State of West Virginia,
Jefferson County to-wit:

This the 24th day of June 1887, appeared George W. Smith before me George W. Graham a Notary in and for the state and county aforesaid, and makes oath and says that he is sixty-nine years of age, that he is a miller, and has been so occupied since he was twenty years of age. That he was so engaged by the Proprietor's of the Harper's Ferry mill in 1874, and has remained in their employment since that time. That the milling year for the manufacture of flour, etc. begins in the first of July in each year and the busiest part of the year is the first six months of the milling year. The lowest stages of water in the Shenandoah river are from the first of August to the last of October, and during that time, the affiant has often known it to be necessary to suspend operations during the day for want of the necessary supply of water the river being too low to furnish the requisite power. That during such times should there be any considerable withdrawal of water from above the Mill and not restored to it before it reached the Harper's Ferry Mill it would compel the said Mill wholly to suspend operations. That the full capacity of the said mill is about three hundred barrels of flour per day of twenty-four hours; but such a result

can only be attained when there is an abundant supply of water. Affiant says he knows from actual observation the operations of the defendants Savery & Co., and is of the opinion that if the plans that have been executed and what are indicated to be yet done, are carried out, there will necessarily be such a withdrawal of water from the Shenandoah river and not restored to it except at a point below the said mill as will seriously impair its power. And at times of the lowest stages of the water in the said river will suspend entirely the work of the said mill.

(Signed) George W. Smith.

From page 34:

"Jefferson County, to-wit:

John H. King being first duly sworn says I reside at Hagerstown Md. Formerly lived at Harper's Ferry. Went to latter place in June 1812 where I lived until 1854. I first went to work for the United States in the rifle factory on the Shenandoah about 1824. Worked there off and on till 1847. In 1840 when Captain Hall went away I had general charge of the rifle factory. The United States got their supply of water for use at the rifle factory from a natural stream which ran to their works, from an inlet which was up at the Strider Mills, and after using same discharged it down along Shenandoah street, which side has always been its natural and accustomed flow.

By Mr. Lucas: Explain fully to the Judge that there are two inlets

By the Court: Yes I have examined that before.

By Mr. Lucas: There are two inlets there, one comes down through by the Strider Mill, and the other by the Blue Bridge.

By the Court: All right.

By Mr. Butt: (Affidavit) This Shenandoah Street channel was the tail-race from the rifle factory and before the war and in my time was always kept open and the water flowed rapidly down it. It was several feet deep. I have recently noticed that this channel has filled up with sand and gravel. The United States never did discharge their waste water over into the main stream of the river at opening to inlet to narrow stream which flows east of them. To have done so would have involved flowing the water up hill. There was always a strong swift current flowing through that Inlet towards town side and by which a large body of water escaped from a main channel and was not and could not be used by anyone. Many years ago there was a temporary log and brush dam placed in this narrow stream to break the force of the current and flow of water as it came from main stream into the Inlet; but it was not used to carry the waste water from U.S. Shops back to main stream through this Inlet. The Rifle Works land was always much lower on side next to town than on side out as it skirts main stream; hence the fall was always towards the town side, and this fact

carried a heavy fall from inlet down to Shenandoah Street stream and accounts for the natural flow of water in the latter direction. This narrow stream or channel east of Rifle Works was always several feet deep, in fact, it was deep enough to swim in. I recollect the building of the John Peacher Mill on what is now called Island of Virginus. This Mill was a very small affair, it was called "a chopping mill" and did not make flour. This mill got a supply of water from main stream.

The present flour mill was formerly a cotton factory. I had \$600.00 stock in it and lost it all. This factory was built between 1844 and 1846 and was in operation about four and a half years when it failed. and never resumed after the failure. This factory got its supply of water entirely from the main stream on the south side and used none of the waste water from the Rifle Factory. The strip of land east of the narrow stream recently shown me, as in dispute between Savery and Mill Company was always looked upon as United States property in my time. I recollect that Mr. Jas. M. Brown made a survey of the public lands at Harpers Ferry under Maj. Symington some years before the war. and included this strip in his measurement. I used to play on this strip of land when I was a boy and knew it well from that time until I left Harpers Ferry, 1854, and can state that during that whole time it was never enclosed occupied or used by anyone. I was born July, 19, 1806. Extraordinary floods in the Shenandoah are of rare occurrence I knew but one in my time and that was the one of 1852. It did no damage to the Rifle Works or Island of Virginus.

(Signed)

J.H.King

From page 48:

By Mr. Butt: Mr. Charles H. Trail, Assessor of Jefferson County, a gentleman who worked for Mr. Herr before the war says:

"Jefferson County, to-wit:

Chas. H. Trail, being duly sworn says: I have lived at Harpers Ferry since 1844 and am well acquainted with the properties on Shenandoah river formerly owned by the U.S. upon which the Rifle Factory stood, now owned by Mr. Savery, and that owned by Harper's Ferry Mill Co., formerly owned by Mr. A.H. Herr. Before the breaking out of the late war, I was working for Mr. Herr in his Flour Mill on Island of Virginus. That was the one that stood on site of old John Peacher Mill. It was burned by the Troops in the first part of late war. Prior to the War this was the only Flour Mill on that "island". It has not been rebuilt since its destruction, and the canal or race which formerly supplied it with water has filled up with sand. Mr. Herr got his supply of water with which to run this mill from the main stream of the Shenandoah river. The water used to run the machinery on U.S. Rifle Factory site came from above, and when used by the United States was discharged into the stream which flows down around Shenandoah street. No portion of it was discharged over through the inlet between upper end of what is called "island of Virginus" and Rifle Works site. The natural and accustomed flow of the stream of water

after leaving the site of the old Rifle Works is down the Shenandoah street side. The natural fall is in that direction, and not over in direction on Main stream. The present flour mill of Harper's Ferry Mill Co. was formerly old cotton Factory but failed several years before the war. The machinery was taken out of it and when I was working for Mr. Herr he used it as a store-house for grain. The first use which was ever made of it for a flour mill was by Child, McCreight & Co. in 1868 or 1869. They ran till 1870, then shut down for repairs, and resumed again in about six months and ran up to 1875, but since that time have only run at intervals. I worked for Child, McCreight & Co. up to 1875. Since 1875 they have been shut down as long as two years at a time, and since the Mill went into the hands of present Mill Co. they have done but little running. They have been shut down for past fifteen months and are now shut down and not operating. Child, McCreight & Co. got their supply of water for the mill from the main channel of River, and not from any portion of the stream the U.S. formerly used on Rifle Works site, and the same has there been obtained since the mill has been owned and used by Harper's Ferry Mill Co. I was employed by Child, McCreight and Co. in millwright repairs for several years. I am familiar with all stages of the water of Shenandoah river, and carefully noticed the high water of 1870 & 1877. I have carefully inspected the work which Mr. Quigley has done on that river in connection with building the Pulp Mill, especially the head gates at upper end and retaining wall down on site of old factory of U.S., as well as overflow, and am of the opinion that it will prove an absolute protection both to Island of Virginus and town of Harper's Ferry against the ravages of floods, even should they be as extraordinary as ones of 1870 and 1877. These were the most terrible which ever occurred in history of Harper's Ferry. Congress has been repeatedly asked, through our representatives to make an appropriation to build just such structures for the protection of the town against floods, as are being erected by Mr. Quigley. I consider all the work that is being done by Mr. Quigley a positive benefit to the Harper's Ferry Mill Co. The dam which holds the water of River for use at Flour Mill of Mill Co. has been in very bad condition for several years. I am at present Assessor for 2nd Dist. of Jefferson County. Have been such for past eleven years.

(Signed) Chas.H.Trail.

Subscribed and sworn to before me this 13th day of July 1887.

(Signed) John Koonce,
Notary Public"

From "Warrenty Deeds to Lands Conveyed by
the Ordnance Department, 1830-1927" (4 vols),
Vol. III, p. 615- National Archives Record
Group No. 121, Public Buildings Service,
Entry No. 58, Washington, D.C.

Survey of the Hall Rifle Factory Island for the U.S. by
S. Howell Brown, February 28, 1885: 13 Acres.

"Survey of the Shenandoah Property at Harpers Ferry known as
Hall's Rifle Factory".

Beginning at an auger hole in the point of a rock about two poles from
the Canal on the north side of Shenandoah Street - a corner to the Corporation
of Harpers Ferry and Bolivar, being at the west line of Boundary Street
and is the point of compromise between the United States and Major George
Rowles in a suit pending in the Circuit Superior Court of Law and Chancery of
Jeffersons County in the year 1827 [Figure 1 on plat] running thence with
a compromise line along Shenandoah Street S 48° W 23.5 poles to a stone at
the edge of the Canal, four poles above the point where the north post of
the old gate lock stood [figure 2 on plat] thence with another compromise
line crossing the Canal and the Winchester and Potomac Railroad, S 65° $45'$
E 17.3 poles to a stone at the margin of the Shenandoah River at the
extension of the west line of Boundary Street [figure 3] thence S 74° E
five poles to a stake in the water, it being the corner fixed at 28.2 poles
from the sycamore tree, a corner in the 125 acre patent in a survey made for
the United States in the year 1827 by William Castleman, Surveyor of Frederick
County, and James M. Brown, Surveyor, of Jefferson County, Va., in running out
the lines of the Rutherford Grant [figure 4] thence with the lines of
said Survey, south 78° E 26 poles to a stake in the water [figure 5] thence
N 74° E 28 poles to a stake in the water [Figure 6] thence N 30° E 8.8
poles to the end of the stone wing wall to an abutment on the Winchester and
Potomac Railroad [figure 7] thence with said wall, E 5.3 poles to the
corner of the abutment [figure 8] thence with face of the same North 1.9
poles to the other corner thereof [Figure 9] thence with the guard wall at
the lower or east end of the island N 11° E 8.5 poles crossing waste way

"to an angle in the wall [Figure 10] thence $N 46^{\circ} 30' E$ 10.55 poles to another angle in said wall opposite the Locks [Figure 11] thence $N 78^{\circ} 30' E$ 7.6 poles to a forked sycamore tree standing on the lower point of the island [figure 12] thence crossing the boat course just below the locks $N 10^{\circ} 45' W$ 4.7 poles to the north side of the stone wall at the south line of Shenandoah Street [figure 13] thence along said street $S 79^{\circ} 15' W$ 16.6 poles to the head of the locks at the north side of the wall [figure 14] thence along the north side of the wall $S 86^{\circ} 15' W$ 14.8 poles to the east end of a large stone on the top of the wall at an angle in the same [Figure 15] thence $S 85^{\circ} W$ 16.5 poles to a point opposite the middle of the old bridge over the Canal to "Halls Rifle Works" [figure 16] thence $S 86^{\circ} W$ 22.15 poles opposite to and near a solid rock in the road [figure 17] thence following the curve of the wall 10.5 poles to a stone at the west line of Boundary Street extended [Figure 18] and finally with said extension $N 4^{\circ} 30' E$ 1.8 poles to the beginning, containing 13 acres, one rood, and 10 perches."

Savery received the deed for this property, 23 acres in final survey, on March 2, 1685.

Sketch of the U.S. Rifle Works at Harper's Ferry, Virginia
Drawn ca. June 1853, by Lieutenant James G. Benton,
U.S. Army. From the U.S. Military Academy Library
Manuscript Collection, West Point, New York.

Harpers Ferry National Historical Park Negative No. HF- 794.

View is drawn looking east along the Shenandoah Canal, looking
 towards the U.S. Rifle Factory and Harper's Ferry.

Shenandoah Street runs along the north bank of the Shenandoah Canal in the center of the sketch. Note the wooden bridge on stone abutments over the canal and leading to the Upper Hall Island. This bridge was apparently constructed in 1851. Beyond the frame bridge, in the distance, can be seen a stone arched bridge which leads directly to the U.S. Rifle Factory shops on the Lower Hall Island. The stone bridge probably dates from 1820.

At the right, near the lower right hand corner, can be seen the roofs of two Armory Dwelling Houses that are situated on the Upper Hall Island. They may be House No. 158, a two-story brick dwelling valued at \$ 900; and Houses No. 159, a two-story stone house valued at \$ 200; and House No. 160, a one-story stone house appraised as worth \$ 250 in 1852.

The large two-story factory, located on the south bank of the canal and standing on the Lower Hall Island, is Rifle Factory Bldg. No. 3, the Finishing and Machine Shop, which was built in 1847-48. A cast-iron turbine water wheel was located in the one-story rear wing that is visible on the right(or side south) side of the main edifice.

The next shop in line, moving to the left(or east) of Bldg. 3, is Bldg. No. 6, the one-story Machine Shop, which was erected in 1852-53. Note the wooden cupola or belfry on the center section of the Machine Shop.

Above Bldg. 6, to the left(or east), can be seen Bldg. No. 4, the Tilt Hammer and Smiths Shop, a one-story, three-part brick shop that was constructed in 1849-51.

Beyond Bldg. No. 4, Bldg. No. 5, the Annealing Furnace and Proof House, which was built in 1851-52, can be dimly seen. This was a one-story three-part-brick workshop.

The fact that Bldg. No. 6, the new Machine Shop, is clearly indicates that this sketch must have been drawn in 1853, or later, as Bldg. 6 was not completed until June 30, 1853.



Figure 19. Sketch of the U.S. Rifle Works at Harpers Ferry, ca. 1851, by Lieutenant James G. Benton. From the United States Military Academy, Library Manuscript Collection, West Point, N.Y. Photograph courtesy of the Harpers Ferry National Historical Park, No. 794. 22 JUNE 1853

VIEW OF THE ISLAND VIRGINIUS. IN THE SHENANDOAH,
AT HARPER'S FERRY, TAKEN NEAR JEFFERSON'S ROCK.

Taken from Nature by Th. Sachs, Lithography by E.
Sachse & Co., Sun Iron Bldg., Baltimore, Md., No. date.

Drawn ca. 1856 or 1857. Harpers Ferry NHP Negative No. HF - 490.

View drawn looking southwest up the Shenandoah River from Harper's Ferry.

The U.S. Rifle Factory, standing on the Lower Hall Island, is visible at the far right and its shops front on the south bank of the Shenandoah Canal. The locks visible at the right are the Lower Locks, the arched stone bridge probably dates from 1820, and wooden bridge across the canal, in the far distance, was constructed in 1851.

~~From~~ ^{From} the Lower Locks of the canal, the following workshops (reading right or west) can be seen on the Lower Hall Island.

Bldg. No. 8. Remodelled Stock House, fronting on the Lower Locks. Two-story stone building with gable roof and three bays wide on east side. This is probably Captain John H. Hall's 1819 blacksmiths shop, remodelled in 1854.

Bldg. No. 2, Proof House, built in 1845, a one-story frame and stone shop, located to the far left, adjacent to Winchester and Potomac railroad tracks on south side and lower (east) end of island.

Bldg. No. 7, the new Coal House, erected in 1854. a 21 by 25 feet brick storehouse 15 feet high. This is located above (or west) of Bldg. 8, and just below Bldg. No. 4.

Bldg. No. 10, Remodelled Storehouse of 1855. Part of this structure is visible above the roof of Bldg. No. 7. This two-story stone building, about 30 by 35 feet was built 1827-33 and may have been Captain John H. Hall's office and storehouse.

Returning to the south bank of the Shenandoah Canal above (west of) Bldg. No. 8:

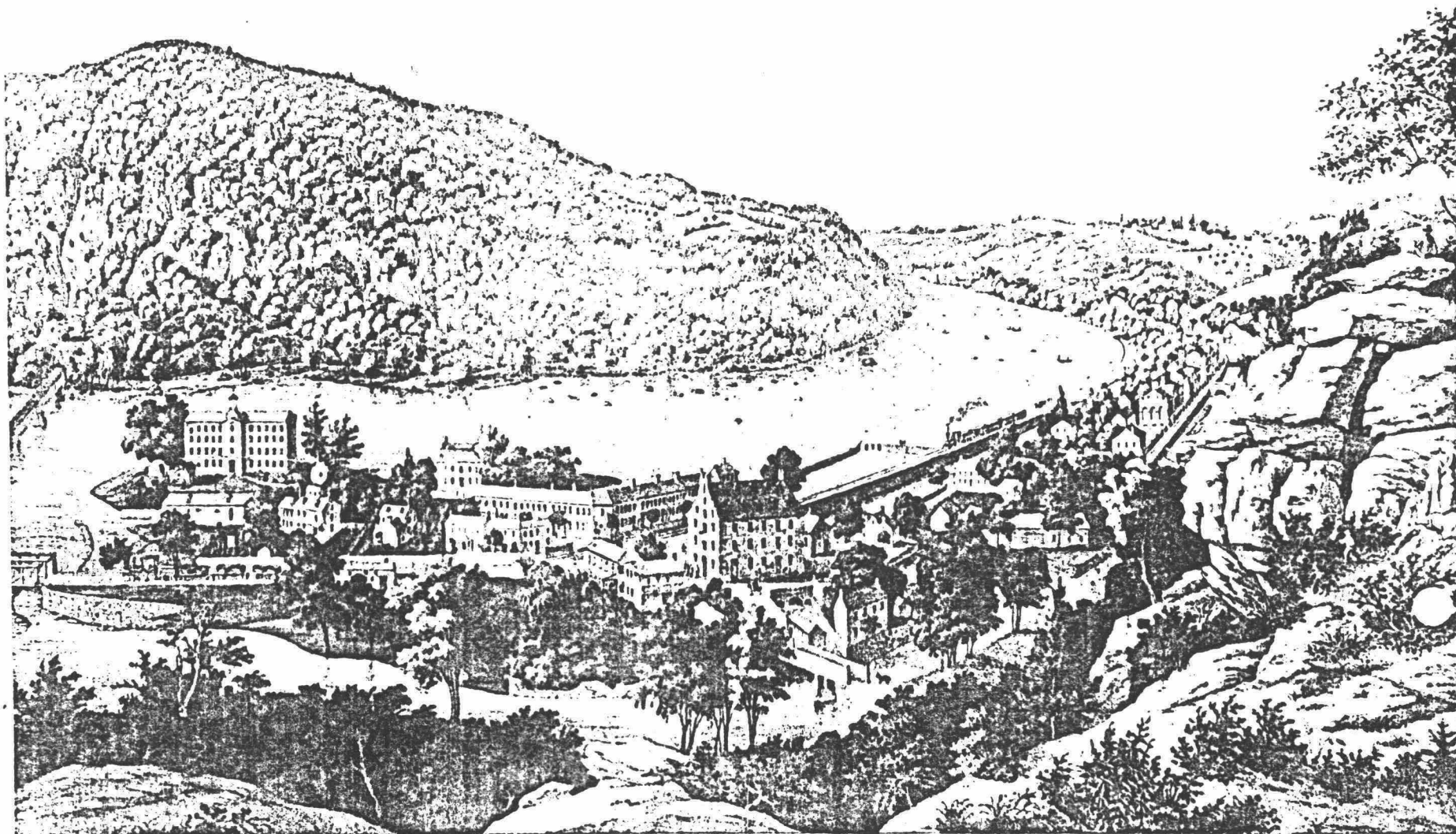
First-large one-story, three-part shop, with two chimneys rising above its center section, is Bldg. No. 5, the Annealing Furnace and Proof House, which was erected in 1851-52.

Second: -Above Bldg. 5, the artist appears to have left out of the drawing Bldg. No. 4, the Tilt Hammer and Smiths Shop, a one-story, three-part workshop that were constructed in 1849-51.

Third, Above Bldg. No. 5 can be seen Bldg. No. 6, the new Machine Shop, which has a cupola on the center section of this three-part, one-story edifice. Bldg. No. 6 was erected in 1852-53.

Fourth, at the far upper end of the line of large shops is Bldg. No. 3, the large three-part, two-story Finishing and Machine Shop, which was built in 1847-48.

The factories and residences in the center and left portions of this drawing are located on the island of Virginus and were privately owned.



W. H. H. & C. CO. N. Y.

VIEW OF THE ISLAND VIRGINIUS, IN THE SHENANDOAH, AT HARPERS FERRY.

TAKEN NEAR JEFFERSON'S ROCK.

U.S. Rifle Factory on the Shenandoah River.
at Harper's Ferry, Virginia. 1861-63.
Photo taken near Jefferson's Rock, May 22, 1863

Harper's Ferry Negative NHP-HF- 37.

Looking west up the Shenandoah River from Harper's Ferry,

In center foreground, note the lower locks of the Shenandoah Canal, moving to the right the stone-arched bridge leading to the shops located on the lower Hall Island, and (further to the right, a wooden bridge leading to the Upper Hall Island. If the date of this photograph is correct, then the small houses to be seen on the Upper Hall Island (above and to right of wooden bridge) are structures that were erected by the U.S. Military Railroad corps in 1864. Three old Armory Dwelling Houses standing on the Upper Hall Island were demolished in 1864 by these troops.

Shenandoah Street runs along the north bank of the Shenandoah Canal at lower right-hand corner of the photo.

The main line of four large Rifle Factory shops fronting on the south bank of the Shenandoah Canal, from left to right, are as follows.

First, Bldg. No. 4, a one-story, three-part shop, the Tilt Hammer and Smiths Shop 110 feet long and 35½ feet deep, erected in 1849-51.

Second (to the right), two and one-half story plus bell tower Bldg. No. 9, Barrel Drilling and Finishing Shop, 57½ feet long and 49½ feet deep, built in 1859-60.

Third, one-story, three-part Bldg. No. 6, the Machine Shop, 87 feet 9 inches long and 35 feet deep and constructed in 1852-53.

Bldgs. No. 4, 9, and 6 formed a shop 254 feet long.

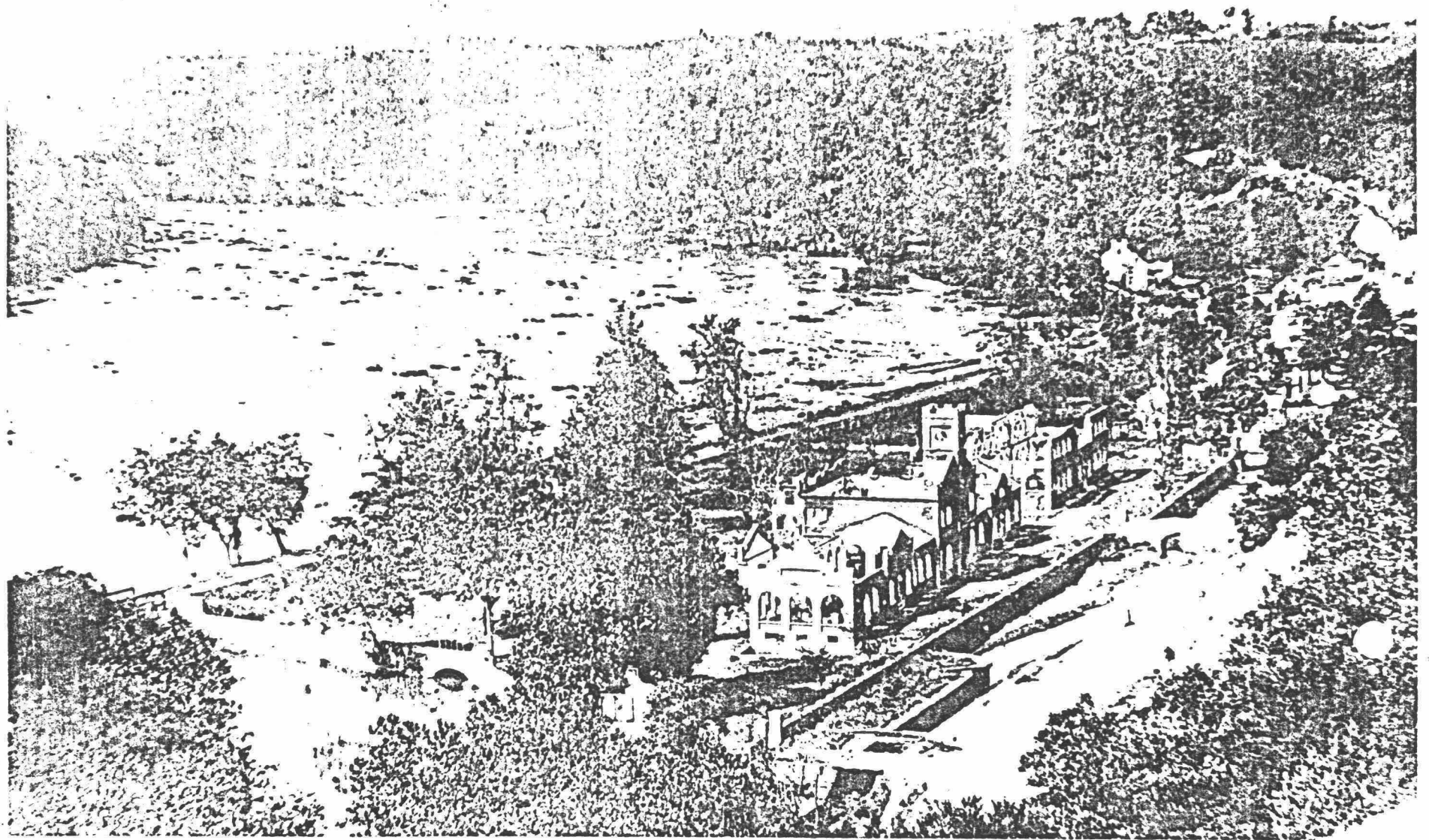
Fourth (to the right of Bldg. 6), is the two-story, three-part Finishing and Machine Shop, Bldg. No. 3, 128 feet 8 inches long and 36 feet deep, erected in 1847-48.

To the south (left) of the rear of Bldg. No. 9 can be seen a portion of a two-story building, with a first-story of stone and the second of brick. This may be Bldg. No. 1, the Filers Shop, 74 by 25½ feet, built in 1843-44.

A 11-foot high wall, once topped with an iron paling fence, that completely enclosed the Lower Hall Island, can be seen in the photo.

At the left side an arched opening in the wall can be seen. This is probably the waste way for the new main tail race that was constructed in 1847-48 and carried the water to and from the water wheels of the new shops, along their south (rear) elevations, in an underground race.

Ruins of a gable end wall can be seen in the trees at lower center, to the left of the lower lock. This could be either the ruins of Bldg. No. 5, the Annealing Furnace and Proff House, 60 by 36 feet, 1 story, built in 1851-52, or Bldg. No. 8, remodelled Stock House, a two-story stone structure, 30 by 30 feet, erected in 1819.

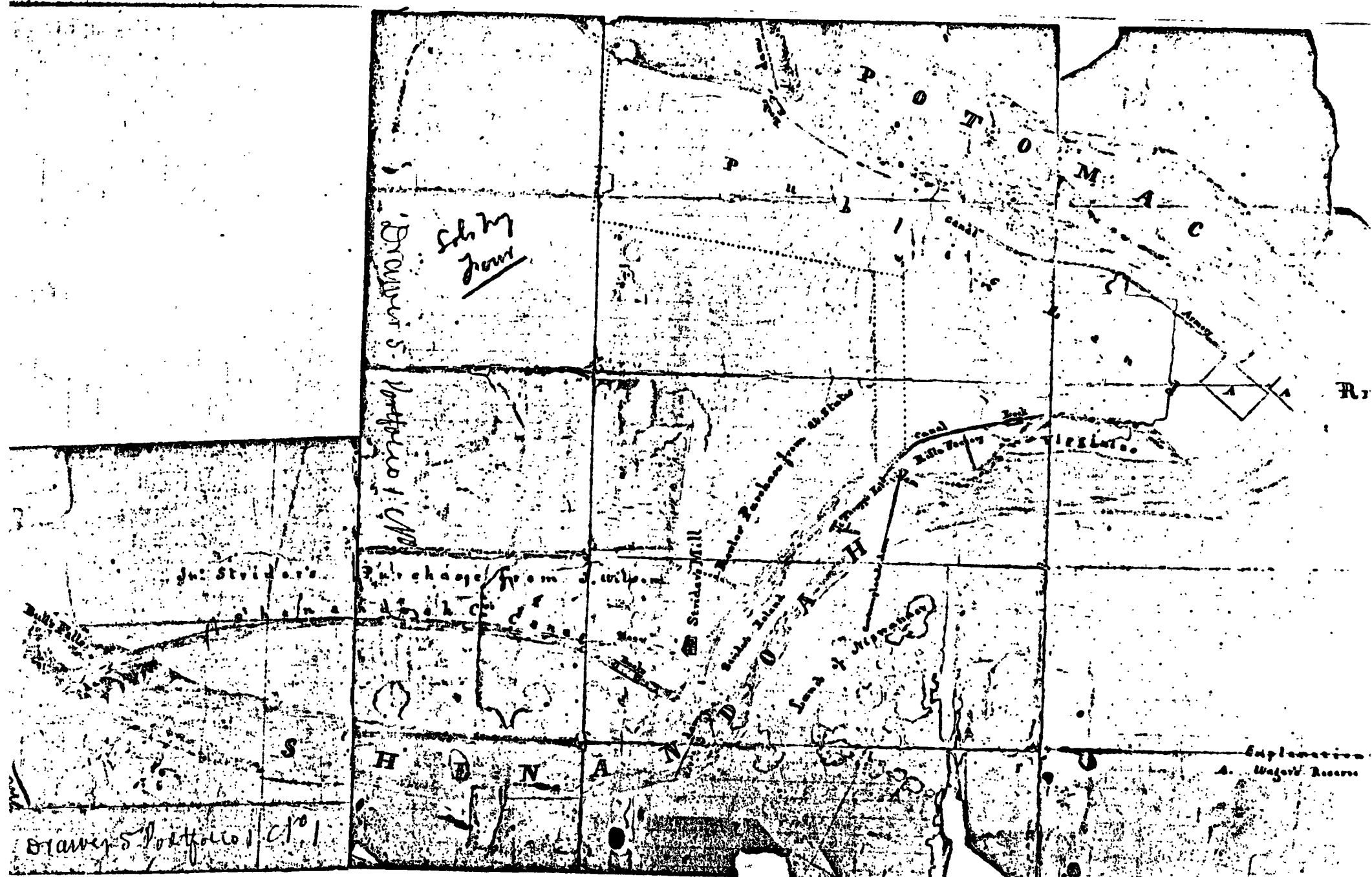


MAP NO. 3

Undated Map of Harper's Ferry, Va.
Showing Shenandoah Canal and site of a Proposed
Dam at the U.S. Rifle Factory

Map prepared drawn ca. 1831 - 1834.
when the Armory was preparing to purchase water power
rights on the Shenandoah River from Strider.

From National Archives, Washington, D.C.
Record Group No. 121, Public Buildings Service,
Harpers Ferry Armory Laminated Material.



MAP NO. . 4

MAP OF HARPER'FERRY,
SHEWING THE LOCATION OF THE WINCHESTER
AND POTOMAC RAIL-ROAD, Drawn by Lieuts.
White, Allen, and R.S. Smith, U.S. Army,
Under the Direction of James Kearney, Lt.
Col. and T.E., 1835- MAP NO. 1

Scale of 100 feet to the inch.

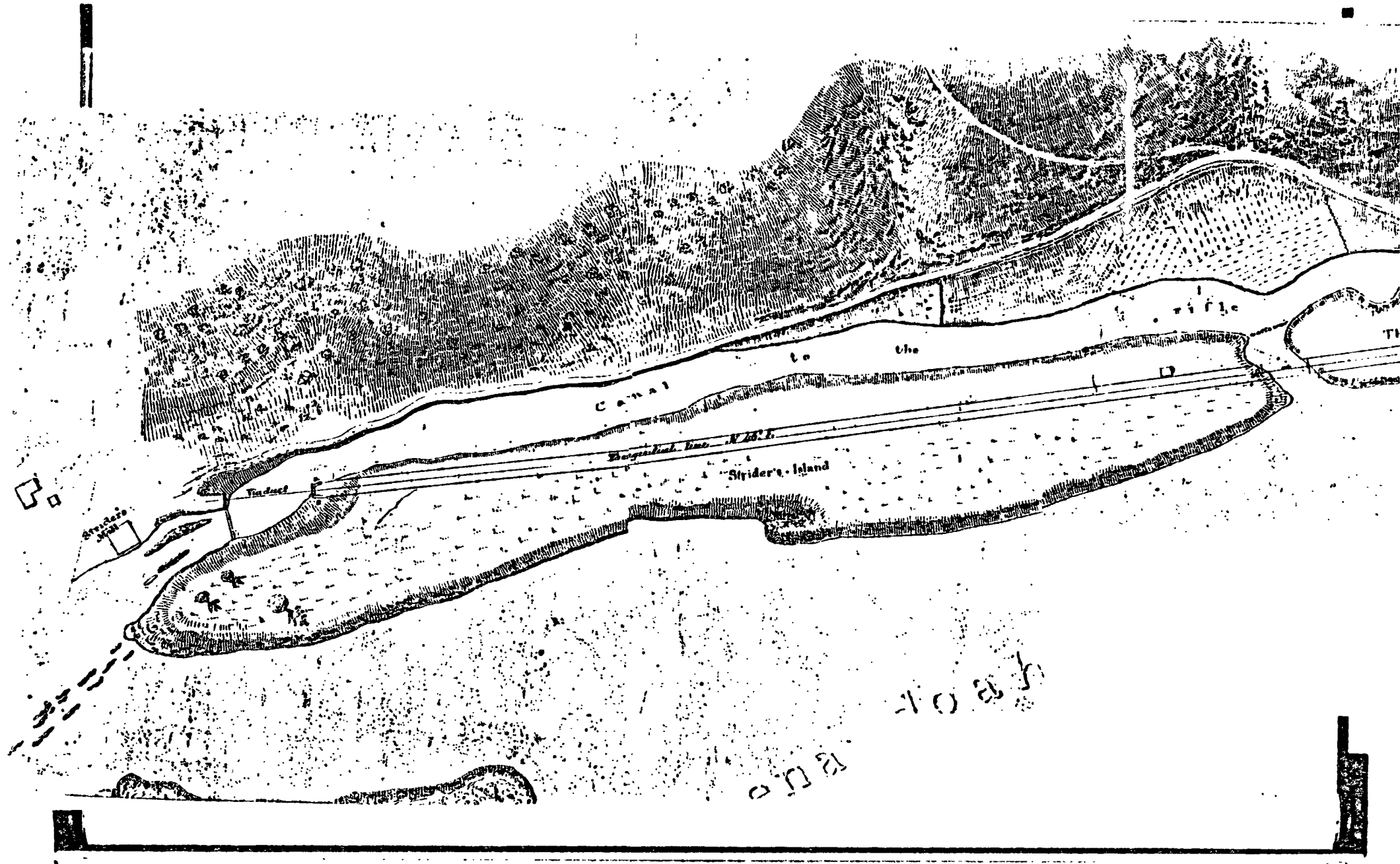
SECTIONS FROM MAP NO. 1

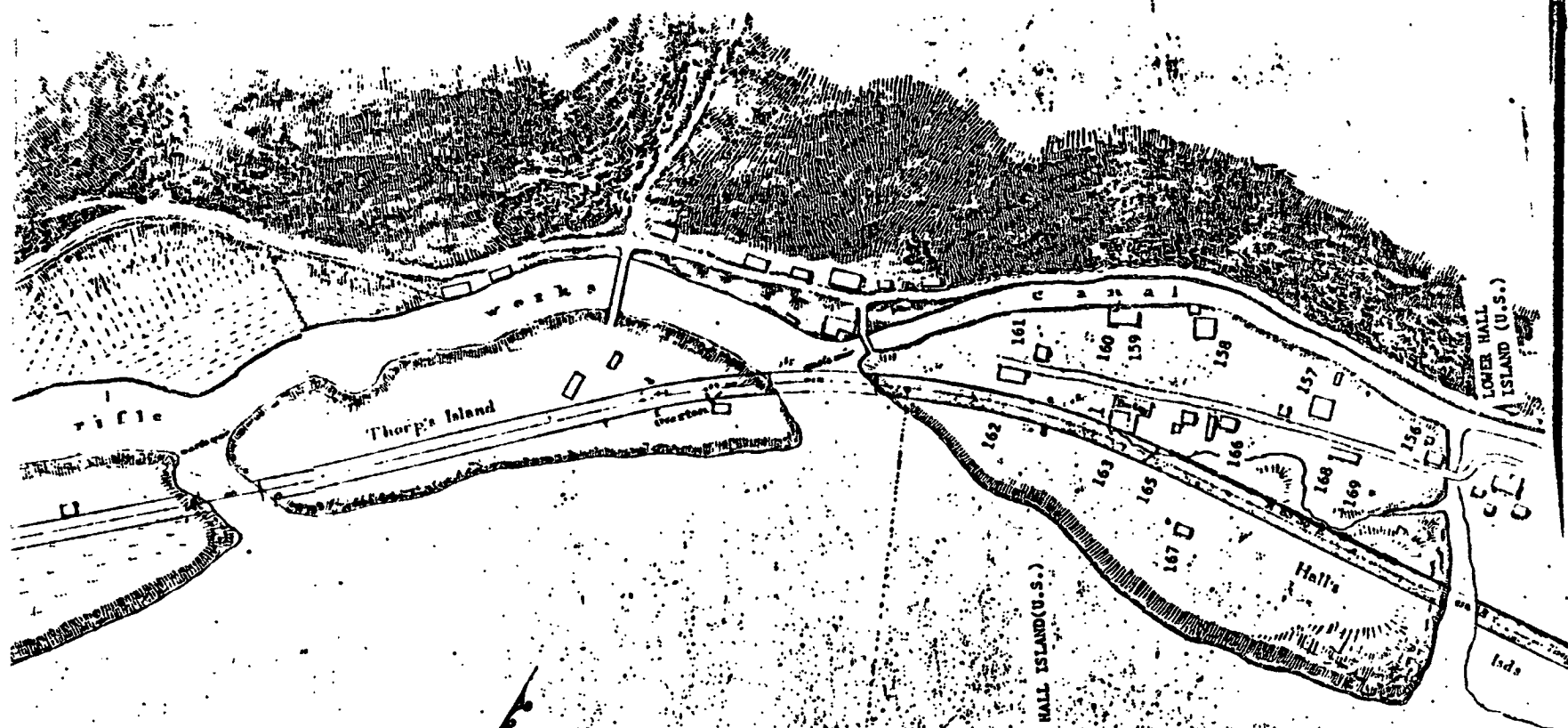
1st. Strider's Mill, Residence and Strider's Island

2nd. Throp's Island and U.S. Upper Hall Island

1841 Armory Dwelling House Nos. have been
added to the map by the writer.

Armory Dwelling House No. 164 was Captain John H.
Hall's residence, a two-story brick house erected on
Camp Hill in 1827 and his home until 1841. The house was
valued at \$ 2,500 and demolished in 1848.





MAP NO. 5

MAP of HARPER'S FERRY Shewing the Location of the WINCHESTER AND POTOMAC RAILROAD, NO. 2, Drawn by Lieuts. White, Allen, and R. S. Smith, U.S. Armory under the Direction of James Kestney, Lt. Col. and T.E. Scale 100 feet to one inch. Approved by President Andrew Jackson, 27th January 1835.

National Archives Record Group 77, Records of the Chief of Engineers, Fortifications Map File, Drawer 150, Sheet 82, part 2, in Cartographic Division, National Archives, Washington, D.C.

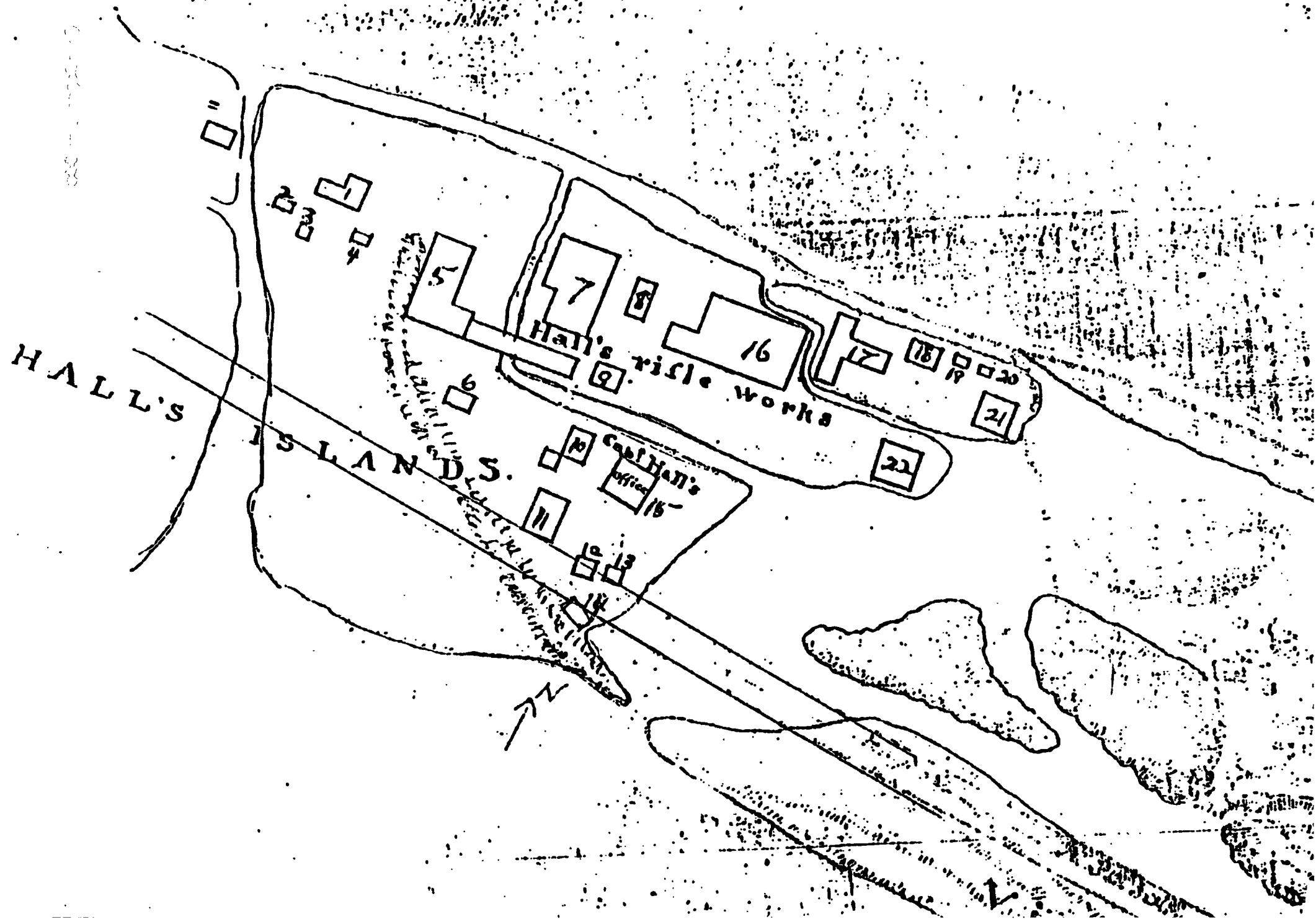
This map shows conditions at the John H. Hall Rifle Factory as of October 1834.

Numbers have been added to the map by the author. Only two of the 22 structures shown on the Lower Hall Island are positively identified on the original maps. These are No. 5-marked "Tilt Hammer" and No. 15, marked "Hall's Office".

Tentative Identification of Rifle Factory Shops

- No. 1. L shaped, about 20 by 25 feet, with 15 by 20 feet wing.
- No. 2. 15 by 10 feet.
- No. 3. 10 by 10 feet.
- No. 4. 15 by 12 feet.
- No. 5. Tilt Hammer Shop, 75 by 35 feet, with 20 by 24 wing and 90 by 18 feet extension. Probably built in 1828, 45 by 45 feet when built.
- No. 6. 24 by 16 feet.
- No. 7. Tilt Hammer Shop, 1808-09, 45 by 45 feet, with 35 by 25 addition. Brick
- No. 8. 32 by 15 feet. Perhaps the 1824 Iron House.
- No. 9. 25 by 18 feet. Perhaps the 1822 Coal House.
- No. 10. 25 by 20 feet, with 15 by 15 wing.
- No. 11. 35 feet by 25 feet.
- No. 12. 18 by 15 feet, stone dwelling?
- No. 13. 15 by 12 feet, stone dwelling?
- No. 14. 20 by 15 feet, stone dwelling?
- No. 15. Capt. John H. Hall's Office, 35 by 30 feet.
- No. 16. Grinding Mill (1808-09)-Bell Shop (1834), 80 by 45 feet with 20 by 20 wing.
- No. 17. Machine Shop (1807 sawmill), 50 by 16 feet, with 32 by 16 wing. Frame.
- No. 18. 20 by 25 feet. Perhaps the 1827 Coal House.
- No. 19. 12 by 10, Annealing Furnace, brick, 1825.
- No. 20. 12 by 10, Annealing Furnace, brick, 1825.
- No. 21. 30 by 30, 1819 blacksmith shop, 2 story stone, of Hall.
- No. 22. 35 by 35 feet, 1827 Smiths or Forging Shop, 1-story stone.

Unidentified structures include the following: Coal House, 1822; Filing Shop, 1831; Store House for Bar Iron, 1824; Charcoal House, 1831; Fire Engine House, 1832; and a 17 by 17 feet filing shop, 1832.



MAP NO. 6

"A Plot Exhibiting the limits of the grounds requisite for the Passage of the Winchester & Potomac Railroad through the Islands, adjacent to Harper's Ferry. MAP C. Scale 100 feet to the inch." No date. Make October 1834.

National Archives Record Group 77, Records of the Chief of Engineers, Fortifications File, Drawer 150 Sheet 78-part 4. Cartographic Division, National Archives, Washington, D.C.

Detail from a section of this map showing the workshop of John H. Hall's Rifle Factory on the Lower Hall Island.

This map shows conditions at the John H. Hall Rifle Factory as of October 1834.

Numbers have been added to the map by the author. Only two of the 22 structures shown on the Lower Hall Island are positively identified on the original maps. These are No. 5-marked "Tilt Hammer" and No. 15, marked "Hall's Office".

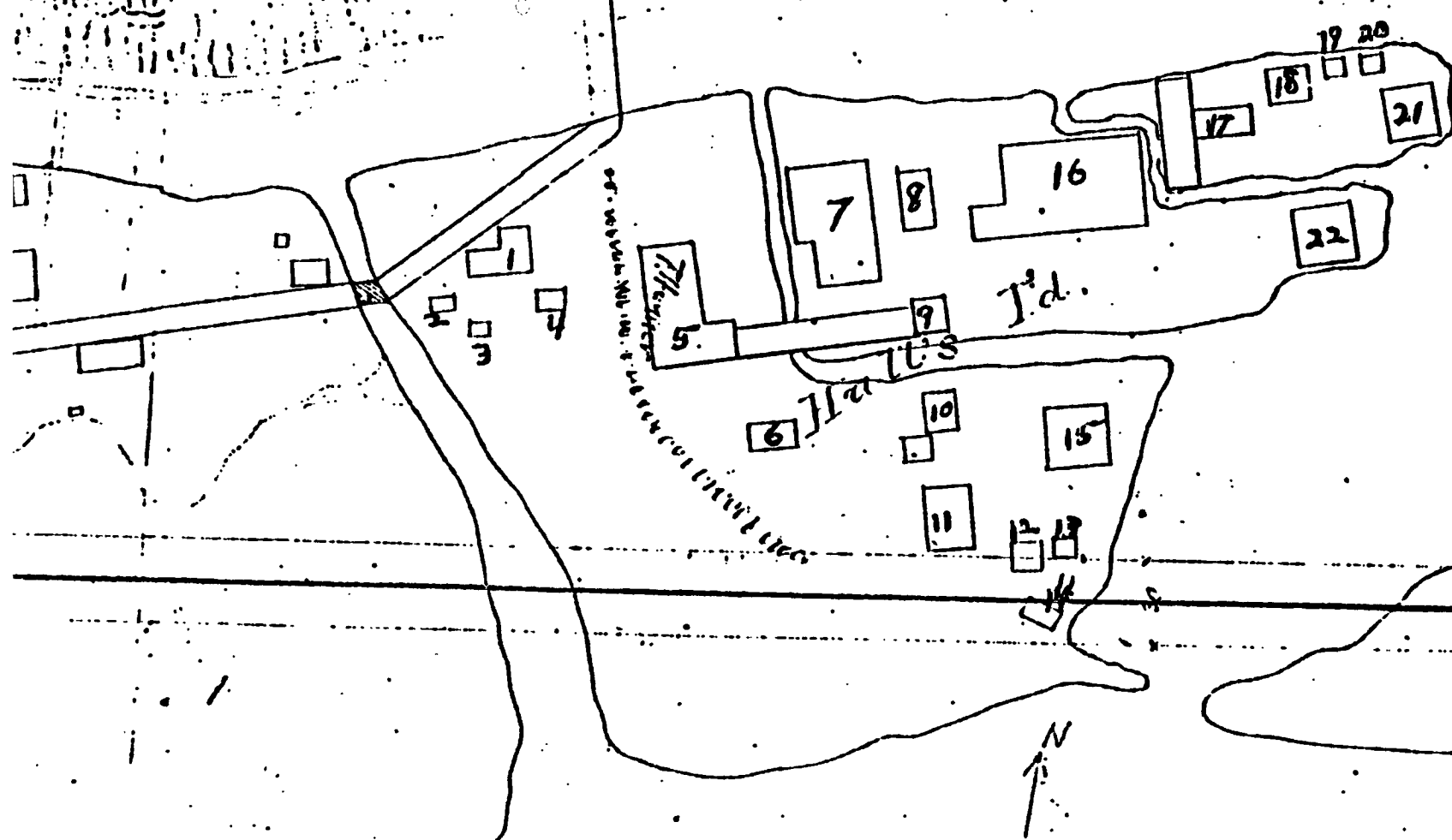
Tentative Identification of Rifle Factory Shops

- No. 1. L shaped, about 20 by 25 feet, with 15 by 20 feet wing.
- No. 2. 15 by 10 feet.
- No. 3. 10 by 10 feet.
- No. 4. 15 by 12 feet.
- No. 5. Tilt Hammer Shop, 75 by 35 feet, with 20 by 24 wing and 90 by 18 feet extension. Probably built in 1828, 45 by 45 feet when built.
- No. 6. 24 by 16 feet.
- No. 7. Tilt Hammer Shop, 1808-09, 45 by 45 feet with 35 by 25 addition. Brick
- No. 8. 32 by 15 feet. Perhaps the 1824 Iron House.
- No. 9. 25 by 18 feet. Perhaps the 1822 Coal House.
- No. 10. 25 by 20 feet, with 15 by 15 wing.
- No. 11. 35 feet by 25 feet.
- No. 12. 18 by 15 feet, stone dwelling?
- No. 13. 15 by 12 feet, stone dwelling?
- No. 14. 20 by 15 feet, stone dwelling?
- No. 15. Capt. John H. Hall's Office, 35 by 30 feet.
- No. 16. Grinding Mill (1808-09)-Bell Shop (1834), 80 by 45 feet with 20 by 20 wing.
- No. 17. Machine Shop (1807 sawmill), 50 by 16 feet, with 32 by 16 wing. Frame.
- No. 18. 20 by 25 feet. Perhaps the 1827 Coal House.
- No. 19. 12 by 10, Annealing Furnace, brick, 1825.
- No. 20. 12 by 10, Annealing Furnace, brick, 1825.
- No. 21. 30 by 30, 1819 blacksmith shop, 2 story stone, of Hall.
- No. 22. 35 by 35 feet, 1827 Smiths or Forging Shop, 1-story stone.

Unidentified structures include the following: Coal House, 1822; Filing Shop, 1831; Store House for Bar Iron, 1824; Charcoal House, 1831; Fire Engine House, 1832; and a 17 by 17 feet filing shop, 1832.

(Map

Hally (Work)



S h e n a n d o a h

' & Photo

MAP NO. 7

MAP OF THE ISLAND OF
VIRGINIUS AT
HARPER'S FERRY, VA.

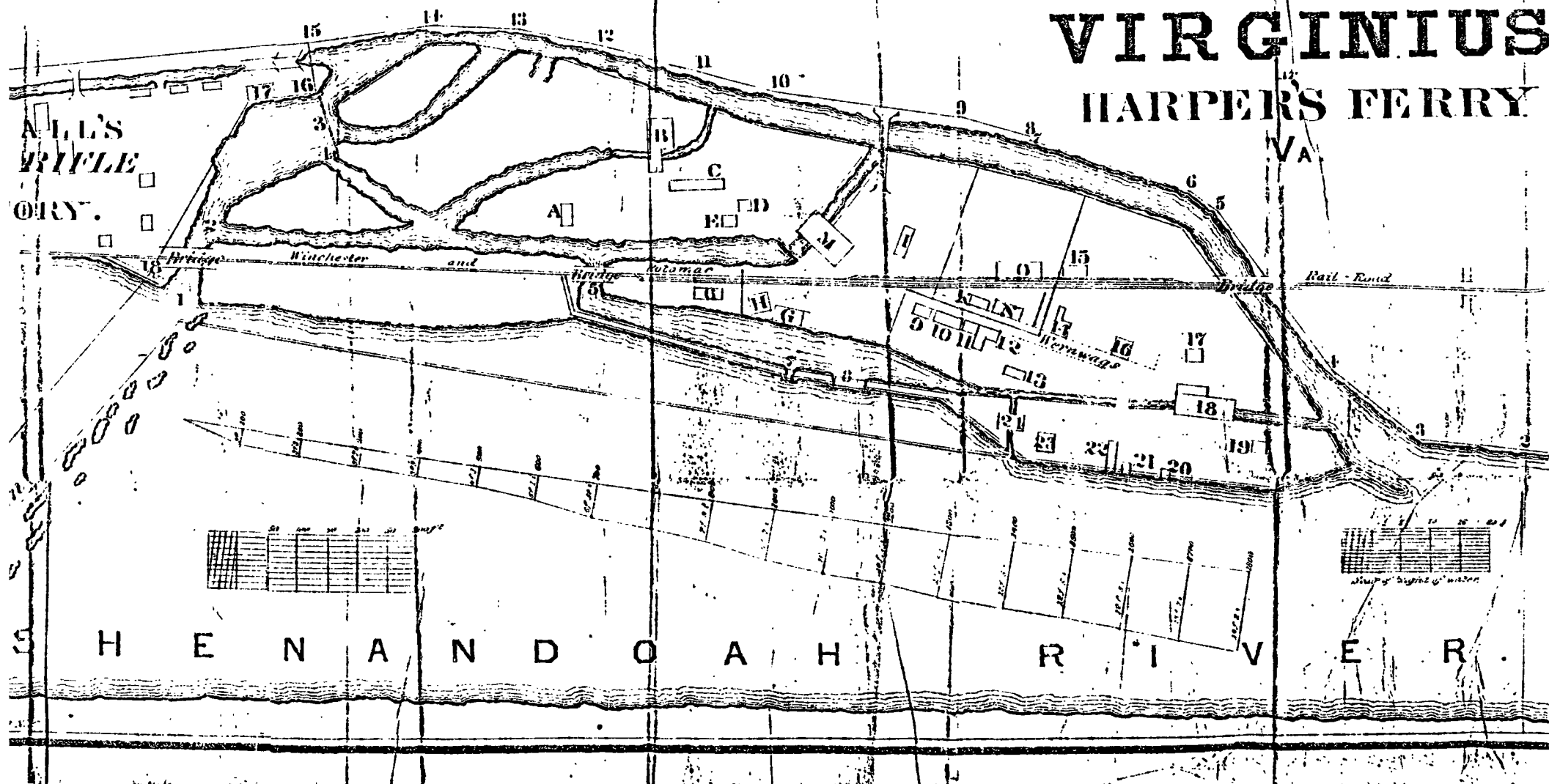
1844

From National Archives, Washington, D.C.
Record Group 153- Office of the Judge Advocate General
1809-1942, Military Reservations Division
Box No. 44.

Record Group 153-
Advocate General-
Reservations

Map - 1911

MAP OF THE ISLAND OF VIRGINIUS HARPERS FERRY



MAP NO. 8

MAP OF HARPER'S FERRY, VA., prepared in
Compliance with Letter to Major (John) Symington,
April 22, 1848, "Drawn by S. Howell Brown, Surveyor,
in 1848. Scale 165 feet to the inch. Original linen
map, only existing copy.

Harpers Ferry National Historical Park Map Collection,
Map No. 77.

On this map of great historical value, Brown shows and names the U.S. Armory buildings in the Musket Factory, the U.S. Rifle Factory, and the U.S. Arsenal. Location of springs, pumps, stables, woodyards, firehouses, schools, and churches are also indicated. In 1851 Major John Symington revised and updated the section of the 1848 map relating to the Island of Virginianus. These revisions were made in red ink on the linen map in 1851.

The dates of construction given after the names of buildings have been added by the writer. The number and name of each structure, however, was placed on the map by Brown in 1848.

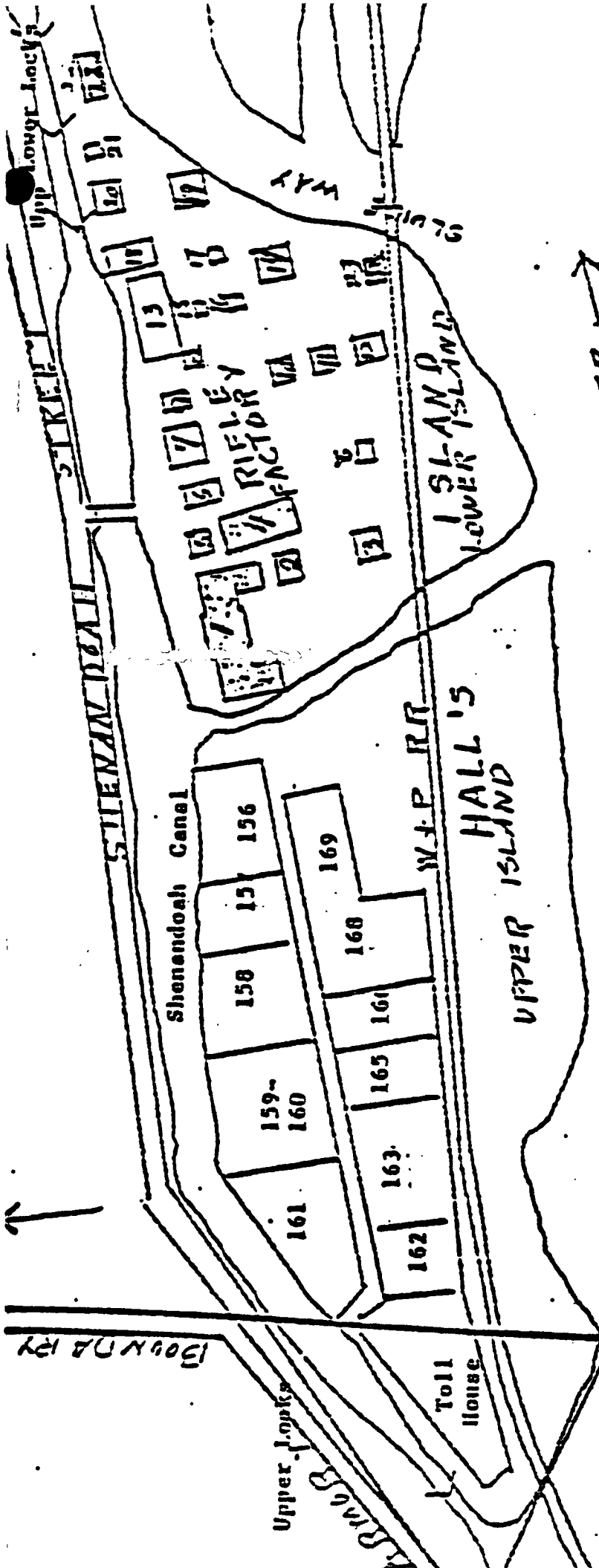
SECTION OF THE 1848 MAP SHOWING THE U.S. RIFLE
FACTORY BUILDINGS ON THE LOWER HALL ISLAND:

Structures not marked "new" by Brown may appear on Maps 9 and 10, both made in 1834, and hence are useful in identifying the unmarked shops on the two earlier maps.

The Upper Hall Island was used as a residential area for Armory employees in 1848 and the numbers of the Armory Dwelling Houses have been added to their proper lots by the writer.

During the 1850's, the original ground levels of the Lower Hall Island were to be considerably altered and elevated as the result of considerable filling and grading.

U.S. RIFLE FACTORY BUILDING:
1848



1. Finishing Shop-New (1846-48).
2. Forging and Tempering Shop. (1837-38)
3. Stockers Shop.
4. Filers Shop- New (1843-44).
5. Filers Shop-Old (1837).
6. Barrel Welding Shop. (1837)
7. Tilt Hammer Shop. (1837-38)
8. Viol House. (1837)
9. Rod Tilting Shop. (1837)
10. Inspectors Office.
11. Assembling and Finishing Shop. (1837).
12. Barrel Turning and Bar Shop.
13. Bell Shop, Stockers and Machinery. (1808-09.)
14. Store House and Office.
15. House for Steaming Steel
16. Engine House (New-1843-44, frame).
17. Privy.
18. Drill Shop (1836).
19. Forging Shop (1827)
20. Annealing Shop. (1835)
21. Annealing Furnace. (1835)
22. Forging Shop. (1819)
23. Proof House (New, 1845), (1 story, frame).

MAP NO. 9MAP OF HARPER'S FERRY - Plate of Harper's Ferry

Armory Property laid off into Lots for Sale in Pursuant
to the Act of December 15, 1868," Scale: 165 feet to inch.

by

S. Howell Brown, November 1, 1869.

Approved by Secretary of War William W. Belknap,
November 16, 1869

National Archives Record Group No. 121, Public Buildings
Service, Entry 76, Deeds from the United States Ordnance
Department, 2 vols., Washington, D.C.

Brown's Map shows the Upper and Lower Hall Islands as
they appeared 1869, without , however, indicating the location of
the ruined buildings that stood on the Lower or Rifle Factory Island.
The positions of the Upper and Lower Shenandoah Canal locks and of
the two bridges to the Upper and Lower Island, however, are given.

MAP NO. 10SURVEY OF THE U.S. RIFLE FACTORY GROUNDS,
(UPPER AND LOWER HALL ISLANDS), 13 ACRES

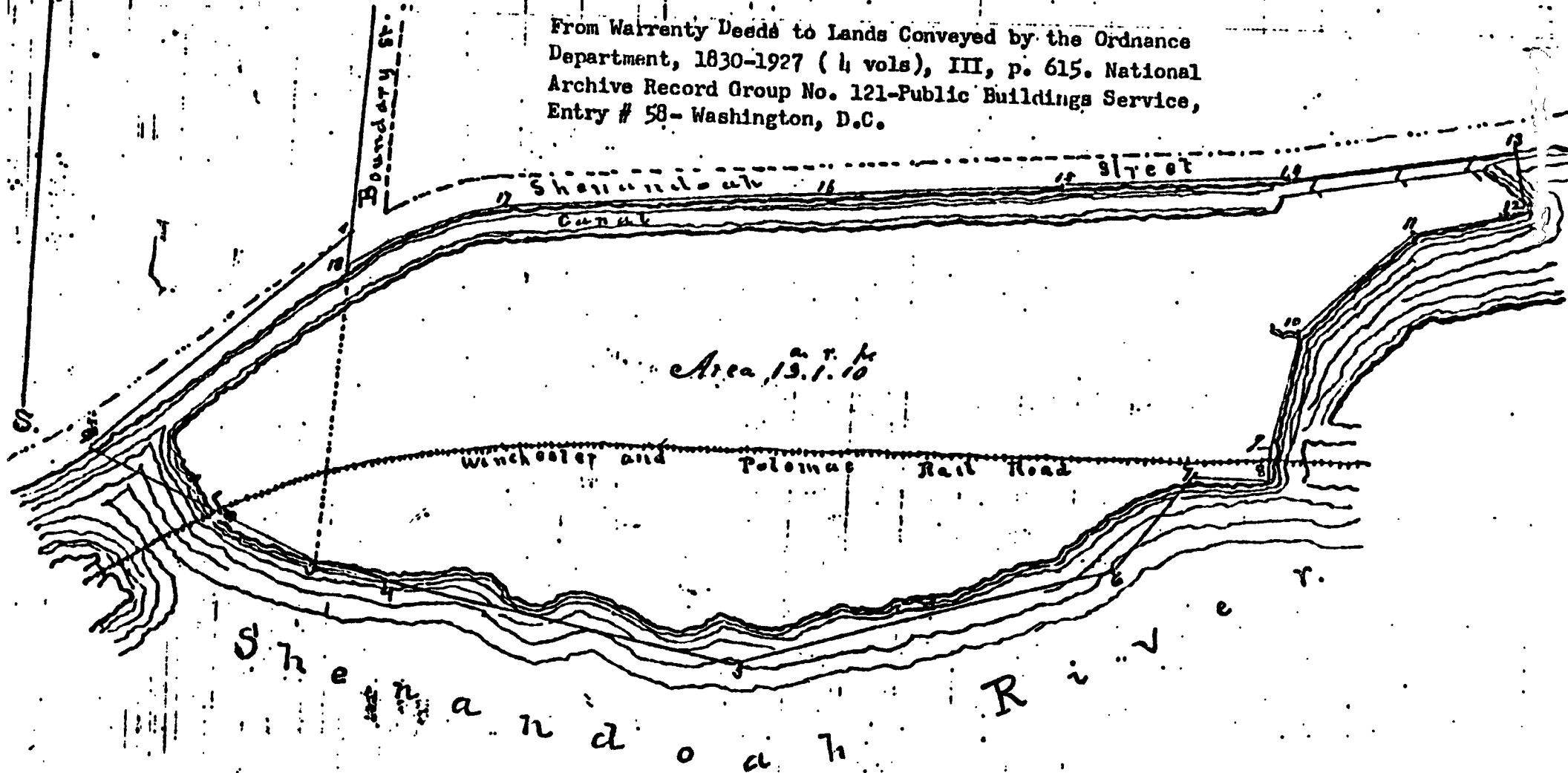
By

S. Howell Brown, February 28, 1885.

Copy provided to Thomas H. Savery, who purchased
this property for \$ 810.00 on October 22, 1884. The U.S.
issued the deed for this land to Savery on March 2, 1885.

National Archives Record Group No. 121, Public Buildings Service,
Entry No. 58, "Warrenty Deeds to Land Conveyed by the Ordnance
Department, 1830 - 1927 (4 vols.) Vol. III, p. 615, Washington,
D.C.

From Warranty Deeds to Lands Conveyed by the Ordnance
Department, 1830-1927 (4 vols), III, p. 615. National
Archive Record Group No. 121-Public Buildings Service,
Entry # 58- Washington, D.C.



Surveyed by S. Howell Brown,
February 28, 1885.

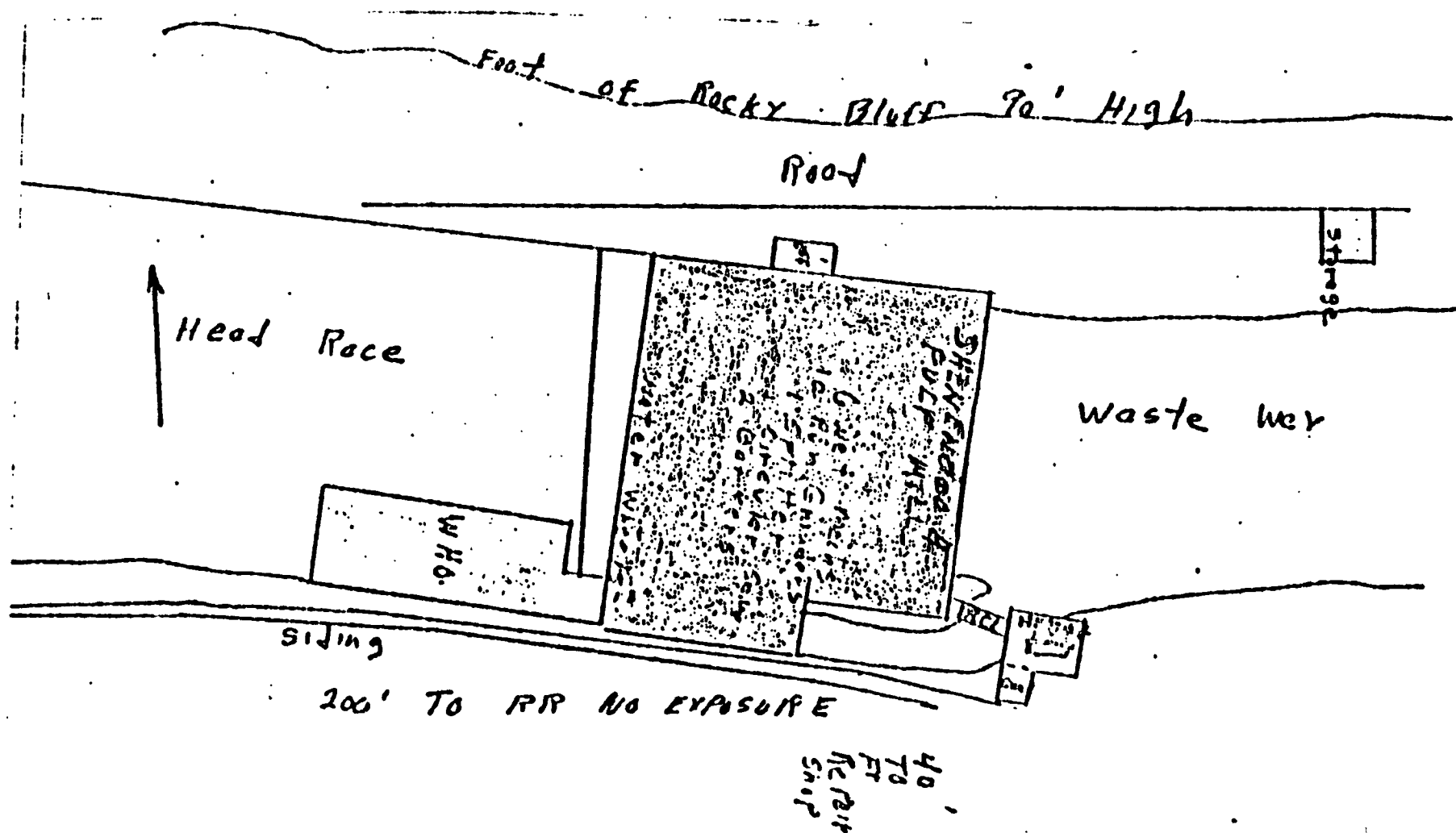
MAP NO. 11

SHEMANDOAH PULP MILL
ON THE LOWER HALL ISLAND

BUILT BY THOMAS H. SAVERY.

From the Sanborn-Peris Insurance Maps of
Harpers Ferry, West Virginia, November 1894

Scale: 50 feet equals one inch.





PLAN and SECTION

of a CANAL at the Lower Falls of the
Shenandoah River.

its junction with the public Canal at

Harpers-ferry.

and the Murphy Locks.

Designed by Wm. & John
Bartow, 1862.

11.11



GENERAL SERVICES ADMINISTRATION

NATIONAL ARCHIVES

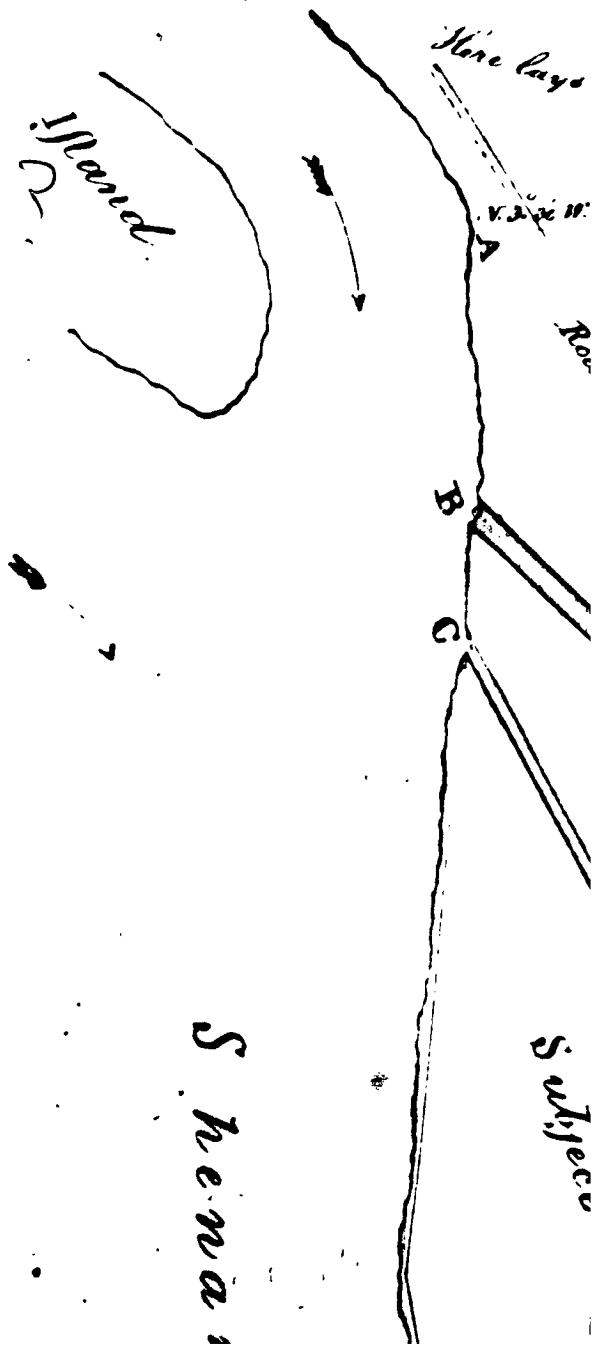


Three Cent meters

RECORDS OF THE OFFICE OF THE CHIEF OF ENGINEERS.
Fortifications Map, 1864, part of map: En. 17.
Sheet 2. Scale: 25 miles to an inch.

Explanation of the Plat.

- A The beginning, at which place is three Sycamores; - the land can't come to these trees and no lower down the river.
- B Shews where the Canal takes the water out of the river.
- D. The Dwelling house occupied by Leonard Harbaugh.
- E Shews the way the waste water is carried off from the Canal.
- F. Shews a situation where a mill may be built, to work two pair of Six feet Stones, and supplied with water by leading it along the old Saw mill race to P. and then by cutting a new race along the dotted lines to F, at which situation ten feet of fall may be had and a sufficient supply of water at all times without interfering with the supply of the Canal at B.
- G, Shews the new Saw-mill. supplied with water from the Canal; at which place a mill might be built to work two pair of Six feet Stones, with ten feet head of water.
- H I K, Shews a lock gate, and the 1st and 2nd Lock.
- M. Shews a situation for a Mill seat that may work two pair of Six feet Stones, which may have 17 feet head and fall of water, and be supplied by the



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rd have the same

might be made
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aving an apperture
to supply the Boats
mills below the
r.

he road to Harpers Ferry.

n by a scale of 8 perches to an inch

