

HISTORY OF THE LOWER HALL ISLAND AND OF
CAPTAIN JOHN H. HALL'S RIFLE FACTORY,

1751 to 1841

Physical History , Volume I

Harpers Ferry National Historical Park,
West Virginia

by

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PREFACE

The purpose of this study is to bring together all available documentary evidence relating to the physical history and use of the Lower Hall Island from 1751 to 1841. This data should facilitate archeological investigation of the U.S. Rifle Factory site by helping to explain the foundation ruins of Captain John H. Hall's Patent Rifle Factory of 1819 to 1844, which lie under the foundations of the large U.S. Rifle Factory workshops of the 1846-61 period.

Historian Philip R. Smith, Jr.'s Research Report "The History of the Lower Hall Island, 1796 - 1848, and Captain John H. Hall's Rifle Factory, 1819 - 1845, Harpers Ferry National Monument, West Virginia," (N.P.S. typescript, Harpers Ferry NM, W. Va., May 27, 1959), 37 pages, should be retired from use. This preliminary report contains many errors of fact and interpretation of evidence.

Charles W. Snell
April 28, 1981

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ILLUSTRATIONS(None).

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. 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. 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 the³ Potomac and Shenandoah Rivers for this purpose.

The 428 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, Warrenty 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 rendering the Potomac open to navigation 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

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.

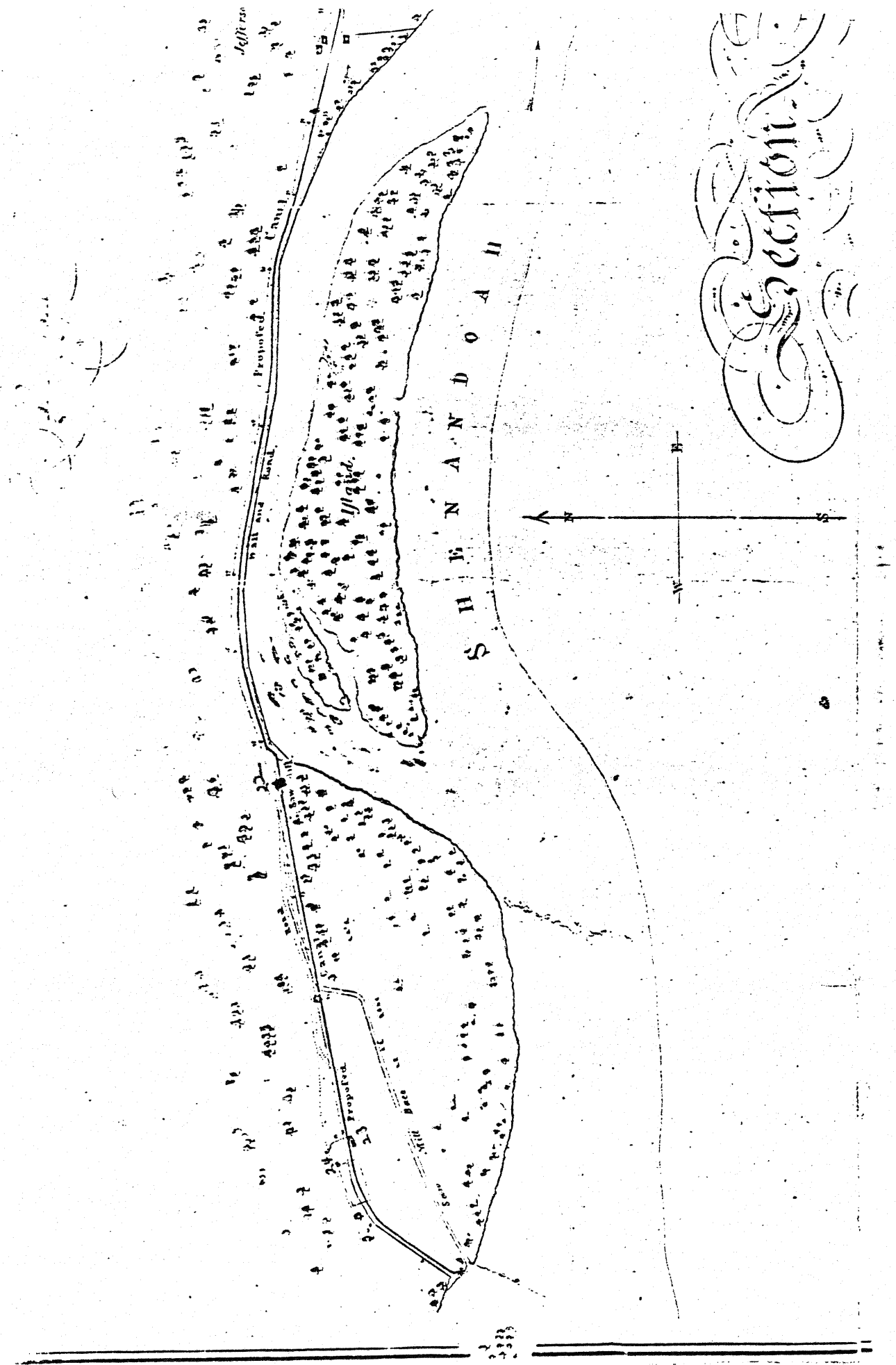
Extract from map showing the Hall Island in the Shenandoah River.

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.

Section



"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 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 Virginius 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

"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..."¹

The Potomac Company completed the construction of this Shenandoah Canal and its two locks in 1807. The 1807 map, prepared by Samuel Annin, shows how the canal and locks were actually built on the U.S. lands on the Hall Islands in 1806-07.² (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 ~~HP~~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 Annin, April 21, 1807, nFNHP Reel 18 ,V. 1, p.50, and Secfetary of War to Annin, may 14,1807, Reel 18, V.1, p.52.

MAP NO. 2

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 Annin 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.

L807 Plat

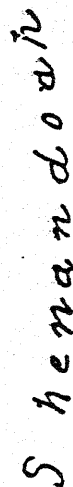
Explanation of the Plat

- A. The beginning, at which place is three sycamores; - the leased land comes to these trees and no lower down the river.
- B. 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 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 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 new 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.
- 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 passing: which would prevent the mills below the locks being stopped by back water.

The lines shaded yellow shew the road to Harpers Ferry.

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

There are no good friends



5. Enlargement of the Armory, Two Workshops built on the Lower Hall Island, 1808-1810:

On May 25, 1808, with war clouds threaten the United States, Secretary of War Henry Dearborn authorized Armory Superintendent James Stubblefield to construct whatever addition workshop were necessary into order to double¹ the production of arms. On June 3, 1808, the Secretary further explained his plan, writing to Stubblefield:

It has been determined to enlarge the Armoury Establishment both at Springfield & Harpers Ferry, & I have given Mr. Annin directions to commence the erection of the necessary buildings, water works, machinery & Apparatus without delay & to have the whole performed on such dimensions & in such manner, as he and you shall agree on generally. For the machinery etc. you will from time to time furnish him with sketches, drawings or directions which he will follow.

It is desirable that the buildings & machinery should be such as may be sufficient for as many workmen, as would be necessary for the manufacture of from 15 to 20,000 muskets annually & a due proportion of Rifles, Pistols & Swords.²

In the period 1808 to 1810, Superintendent James Stubblefield designed and Armory Paymaster Samuel Annin constructed seven new brick workshops for Armory use, thus increased the grand total of factory buildings to nine. Two of the new shops, plus the 1807 frame saw mill, were located on the Lower Hall Island. This shops represent the first use of the water power of the Shenandoah River to manufacture arms. The other five new workshops, plus the original brick shops, were situated at the Musket Factory on the Potomac.

The expenditures for repairs and improvements, 1808 - 1810 (3)

YEAR	New Construction	Repairs
1808	\$ 40,655.32	\$ 2,356.87
1809	37,231.26	2,732.21
1810	14,192.90	2,448.55
TOTAL:	\$ 92,079.48	\$ 7,547.63

1. Harpers Ferry NHP Microfilm Reel 18, Vol. 1, p. 77.
2. Harpers Ferry NHP, Reel 18, Vol. 1, p. 77.
3. American State Papers, Military Affairs, Vol. II, p. 481.

Although the original plans for the buildings no longer exist, the following two lists provide considerable data, including the dimensions, number of stories, materials constructed of, and the use made of all Armory structures in 1810 and 1811:

- (1) "Public Buildings at Harper's Ferry in Virginia , 1st January 1810," prepared by Samuel Annin, Military Storekeeper, 4
- (2) "Public Buildings at Harper's Ferry in Virginia, 1st October 1811." prepared by Samuel Annin, Military Storekeeper, 5

ARMORY WORKSHOPS LOCATED ON THE LOWER HALL ISLAND IN THE
SHENANDOAH RIVER, 1811

1811 No.	Materials	Dimensions in Feet	No. of Stories	Remarks
9	Brick	80 by 45	one	Machinery for heavy grinding-barrels, &c. (built in 1808-09).
10	brick	45 by 45	one	Tilt shop calculated for 4 hammers-only 2 in operation in 1811. (built in 1808-09).
0	wood	(50 by 16)	(one)	New Saw Mill [erected ca. 1807- to Replace Harper's old mill.]

Judging from the 1821 inventory of Armory buildings, the cost of constructing the grinding mill was probably about \$ 6,000 and that of the Tilt Hammer Shop approximately \$ 4,000. Both workshops had water wheel to power the machinery.

4. National Archives Record Group 107, Secretary of War Letters Received, A-29(5), submitted by Samuel Annin, March 17, 1810. Photostat of list in Park Library Collection.
5. National Archives R.G. 107- Sec. of War Letters Received, A-72 (5), submitted by Annin, Oct. 24, 1811. Photostat of list in Park Library.

The construction of these two water shops on the Shenandoah probably increased the cost of manufacturing arms at Harpers Ferry. Most of the work on the weapons was done at the U.S. Musket Factory, but the components, after 1809, had to be transported by horse and wagon nearly one mile to the two shops on the Lower Hall Island for work in those water shops and then carted back another mile to be completed at the Musket Factory.

The Grinding Mill, Tilt Hammer Shop, and Saw Mill comprised the total Armory plant on the Lower Hall Island from 1810 to 1818.

CHAPTER II

The Lower Hall Island, 1819 - 1821

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.

During the period 1819 to 1841, Hall held the title and received the pay of a Master Armorer and he worked under the supervision of the Superintendent of the Harper's Ferry Armory.

Construction of the Hall Rifle Factory, 1819-21:

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. He was to receive a royalty of \$ 1 for each weapon produced and a salary of \$ 60 per month from the Ordnance Department.

Hall arrived at Harper's Ferry in April 1819. In his letter of instructions to Stubblefield regarding Hall, Col. Wadsworth wrote:

"It is my wish the regular business of the Armory should be as little interrupted as possible by the arrangements for Mr. Hall's rifles and no more than it must unavoidably be in consequence of taking off some of the Hands to Work under him. As to the erection of new Buildings for machinery and workshops it is out of the question because such an object was not contemplated in the Estimates and appropriations (for 1819), and we have not money to spare for new Buildings. If you can arrange at any of the workshops so as to apply additional machinery to some of the Water Wheels I have no objection to its being done. As it is not expected any more hands will be employed than were before, I do not perceive that more Shop room will be needed..." 1

Captain Hall, however, thought otherwise, and notified Wadsworth on May 3, 1819, that he would need some new buildings, writing:

"Mr. Stubblefield as well as myself is convinced that the erection of proper buildings and machinery on the (Lower Hall Island on the) Shenandoah will be more compatible with the public interest, in point of economy, as well as in other respects, than establishing my works at the shops on the Potomac where they must be placed unless such buildings and machinery are permitted..." 2

Col. Wadsworth acceded to Hall's request and directed Superintendent Stubblefield to prepare an estimate for use in the 1820 estimates for Hall's buildings. . 3

Stubblefield responded on August 2, 1819, writing:

"Agreeably to your request I herewith enclose you an estimate of the probable cost of the buildings, which Mr. Hall wishes to be built for workshops, dwelling houses, &c....

HARPER'S Ferry, 2nd August 1819. Estimate of the probable amount of the cost of the following buildings for the manufactory of Mr. John H. Hall's Patent Rifle.

1st. Fitting up the old saw mill (erected in 1806-07.)	
& a water wheel to the same.....	\$ 600.00
2nd. Building a stone black smith shop.....	600.00
3rd For the erection of 3 dwelling houses for the	
accommodation of his hands.....	1,350.00
4th. For the building of a new Saw Mill on the Potomac....	350.00
	\$ 2,900.00

Col. Wadsworth approved this construction program on August 19, 1819, informing Stubblefield: ".... You are hereby authorized to execute what is proposed, taking care not to let the Expenditure exceed \$ 3,000.00. 4

2. Harpers Ferry NHP Reel 14, Vol. 3, p. 218.

3. HFNHP Reel 13, V.3, p.230-231.

4. Reel 14, Vol. 3, p.220.

Work on Hall's two shops got underway at once; the new building, the smiths shop, was a two-story stone structure, 30 by 30 feet in size and valued \$ 1,000.00, the old frame saw mill, a one story building 50 by 16, was converted into a Hall's machine shop, with the machinery being driven by a water wheel. The machine shop was valued at \$ 500.⁵

The smith shop was apparently built by the mason Edward Harding, who was assisted by three tenders, namely James Carter, James Catin, and Samuel Downney.⁶ They received a total of \$ 719.38 for their mason work.

In addition, the mason Jonah M. Tompkins was paid \$ 11.00 for "5½ days work on building the chimneys to the new Smiths shop on the Shenandoah."⁷

The carpenter work on the the two shops and probably also on the three small dwelling houses that were erected was executed by Charles Fouke and his two journeymen, John Little and John Setlocro, who received a total of \$ 396.00 for a total 229 2/3 days of labor during August to December 1819.⁸

John A. Bennett and H. C. Shannon were paid \$ 86.62 " for plastering 609 yards in the Public Work Shops (at the Musket Factory) & on the

Shenandoah." on November 12, 1819.⁹ Jonathan Nixon, who was paid \$ 50.75 on November 11, 1819, may have done the painting and glazing on

the Hall Island buildings.¹⁰

5. ASP, II, 482- description of from 1821 inventory of buildings.

6. R.G. 217-f. 3266, v. 66-Edward Harding, who was one of principal masons of the armory was paid \$ 608.88 for laying 876 perches of stone wall on Nov. 30, 1819- he probably built the smith shop. The three tenders who definitely worked on this shop were paid as follows: f. 3266-11-James Carter, Oct. 9, 1819-\$ 47.00 for 47 days work; Samuel Downney, Oct. 19, 1819-\$ 15.00 for 15 days work; and 3266-V. 50, James Catin, Nov. 12, 1819-\$ 48.50 for 48½ days work.

7. R.G. 217.F. 3266- V. 28, paid, Oct. 21, 1819.¹

8. R.G. 217- f. 3266, Voucher 104, paid Dec. 31, 1819. To Charles Fouke, "for 104 days carpenter work performed in the months of Augt., Sept., Oct., Nov., & Decr. on the public work shops, &c, on the Shenandoah at \$2 per day= \$ 208.00"

99 2/3 days performed by John Little as Journeyman at \$ 1.50 p. day= \$ 149.00'; for 26 days performed by John Setlocro as journeyman at \$ 1.50 p day= 39.00."

Total paid, \$ 396.00.

9. R.G. 217, f. 3266-V. 49.

10. R. G. 217. f. 3266-V. 44.

Robert Painter did the millwright work, converting the old saw mill into Hall's principal machine shop . He received \$ 207.97 for his services on December 31, 1819. The voucher paying him itemized his work as follows:

"For making a water wheel for a new workshop			
12 feet (in diameter)	at \$ 3.50 p.ft.	\$ 42.00	
making a cog wheel 7 feet 9 in diameter)	at \$ 4.00 " "	28.00	
making 2 head blocks	" \$ 2.00	4.00	
" 4 spur blocks	75 cts.	3.00	
" 1 large shaft 22 feet long at	\$ 1.50	33.00	
" 1 " 19½ " " "	\$ 1.25	24.37	
" Breast, shoot & gates		18.00	
" 2 Turning Lath frames	at \$ 5.00	10.00	
23 ¾ days work	at \$ 1.92	45.60	
			\$ 207.97 (11)

John H. Hall's Patent Rifle Factory, consisting of two workshops, was thus completed and in operating order by December 31, 1819.

The total of charges for the services of masons, carpenters, plasters, painters, and the millwright did not exceed \$ 1,466.72 in 1819.

\$ 230.12 was spent on construction at the Lower Hall Island in 1820 for the following construction:

To Thomas McKinney, December 17, 1820, for quarry 137½ perches of stone for building a bridge over the trail race of the water shop on the Shenandoah.....\$ 55.00 (12)

To Mason Jonah N. Tompkins, October 15, 1820, "for laying 78 perch of stone wall in a bridge over the tail race of one of the water shops on the Shenandoah,".....\$ 39.00 (13)

For bridge over tail race to one water shop: \$ 94.00

11. R.G. 217-f. 3266-V. 95.

12. National Archives Record Group 217-Records of Second Auditor, File No. 4490, Voucher No. 15, dated December 17, 1820, for \$ 55.00.

13. Nat. Archives R.G. 217, File 4490, Voucher 6, dated October 20, 1820.

The second 1820 project involved the construction of a stone arched bridge across the Shenandoah Canal to the Lower Hall Island.

On December 27, 1820, Thomas McKinney, for "quarrying 100 perch of stone for building a bridge over the canal on the Shenandoah," received.....\$ 40.00 (14)

To mason Jonah N. Tompkins, December 23, 1820, "for laying 120½ perches of stone wall in a bridge over the canal on Shenandoah" and for "20½ days laying brick in the arch of the above bridge..... \$ 96.12 (15)

Cost of stone arched bridge, December 1820: \$ 136.12

No new construction was undertaken at the Rifle Factory in 1821.

The Ordnance Department records indicated that a total of \$ 3,869.44 was expended for construction at the Hall Rifle Factory from 1819 to

1821 as follows:	1819: \$ 3,748.40	
	1820: 121.04	
	1821: 0	
	<u>Total: \$ 3,869.44.</u>	(16)

The Second Auditor of the U.S. Treasury Department, W. B. Lewis, in his November 16, 1835 report to Congress on the expenditures at the Harper's Ferry Armory and the Rifle Factory from 1796 to Dec. 31, 1834, on the other hand, wrote that the total expenditures at the rifle factory for "Buildings, millwright work" from 1819 to 1821 inclusive" was \$ 4,130.14.¹⁷, a difference of only \$ 260.70 from the Ordnance Department Accounts.

17. ASP, V.923. By including the cost of constructing the new Armory sawmill on the Potomac against the rifle factory, which amounted to approximately \$ 472.75, payments for construction labor at the rifle factory, 1819-20 came to about \$ 2,169.59. R.G.217-f.3266-v.99, dated December 31, 1819 paid Thomas Morgan and W. Harbert \$ 256.00 "for quarrying 640 perches of stone for erecting a armory shop and a dwelling house." This may have been used at the rifle factory.

14. Nat. Arcives R.G. 217, File 4591, Voucher No. 15, December 27, 1820.

15. Nat. Archives R.G. 217, File 4591, Voucher No. 2, December 23, 1820.

16. Entry 935, National Armory Accounts.

In 1821 a sharp-eyed traveler visited Harper's Ferry on June 21 and wrote a detailed account of his inspection of the U.S. Armory. On the Lower Hall Island he reported he found:

"On the Shenandoah are four buildings, two brick (Armory workshops), one stone, and one frame (the latter two being John H. Hall's Work shops). One (brick) contains three hammers, one (brick) for forging and two tilt hammers. One (frame) is used for small machinery such as turning etc. and one (stone) is a blacksmith shop." ¹⁸

"A Statement of the Number and Dimensions of the Buildings at the U.S. Armory at Harper's Ferry, Virginia, together with the Material of which they are built and their estimated Value," dated November 20, 1821, ¹⁹ provides the following information on the four Lower Hall Island shops:

THE WORKS ON THE SHENANDOAH:

1811 No.	1821 Dimensions in feet	No. of Stories	Material	Value	Remarks
9	85 by 40	1	Brick	\$ 6,000	Workshop of Armory (built in 1808-09 with machinery for heavy grinding). 3 hammers in 1821. Water wh.
10	45 by 45	1	Brick	\$ 4,000	Workshop of Armory (built 1808-09 as tilt hammer shop. Had two hammers working in 1810). Water wheel and 2 hammers in 1821.
0	50 by 16	1	Wood	\$ 500	Old armory sawmill dating back ca. 1807) Converted in 1819 to principal machine shop of John H. Hall, had new 12 ft dia. water wheel.
0	30 by 30	2	Stone	\$ 1,000	New blacksmith shop erected in 1819 for John H. Hall's Rifle Factory.
Total: Four Shenandoah Shops:				\$ 11,500	

18. "Description of Harper's Ferry, Virginia, written Saturday, June 21, 1821, copied from a manuscript letter that was owned in 1959 by Mrs. E. Bruce Allen of Moorefield, W. Va.

19. Published in American State Papers, Military Affairs, Vol. II, pp. 482-483. The 1821 inventory does not indicate the location of the buildings, but this has been deduced from the 1810-11 lists and the 1821 letter.

CONSTRUCTION ON THE LOWER HALL ISLAND, 1822 - 1829a. Repairs and Improvements to the Armory Plant on the Shenandoah:

In 1822 the Armory erected a " House for the storage of stone¹ coal at the works on the Shenandoah" at a cost of \$ 200.00. This was probably a small one-story stone building.

In 1824 the Armory constructed a " Store House for bar iron² at the works on the works on the Shenandoah" at a cost of \$ 500.00.

This was a stone building.

On March 13, 1826, the carpenter Samuel Thropp was paid \$ 10.00 "for fitting up a lodging room for the workmen over the iron house," thus³ indicating that this was probably a one and one-half story storehouse.

In 1827 the armory spent a total of \$ 1,500.00 making an addition to the old brick grinding mill. This construction included the excavation, walling up, and covering of the head race for this shop.⁴

In 1828 the Armory spent \$ 333.00, reported to be one-third of the expense of constructing a wooden bridge over an "arm of the Shenandoah."⁵ This wooden bridge was probably to the Armory Dwelling Houses that were located on the Upper Hall Island.

1. R.G.-217- 6410- Abstract C, V.27- the mason may have perhaps been Robert Painter, who was paid \$ 100.00 on Aug. 22, 1822 for quarrying, hauling, and laying 80 perches of stone wall in a building.
2. R.G. 217-File. 8108-V. 132A- Michael Walsh was paid \$225.00 on June 30, 1824 for quarrying, hauling, and laying 225 perches of stone in "a building for an iron house." He was also paid \$ 71.00 for laying 71 perches of stone wall in a "building in May 1824- as follows: F. 8108-V. 3A-May 18, 1824-\$ 50.00; F. 8108-V.53A-May 28, 1824-\$ 21.00.
3. R.G. 217- File 9851, Voucher 5A
4. R.G. 217 ,National Archives
6. Entry 935, National Armory Accounts.

The Armory Paymaster's voucher reveal that the following four men were engaged in making the addition to the grinding mill in 1827:

John Gust:				National Archives R.G. 217
File	Voucher	Date	Paid	Work done
12013	51A	Nov. 3, 1827	\$ 47.25	For cart and horse, 26 days excavating earth in new head race of new grinding mill.
12013	61A	Nov. 7, 1827	\$ 87.50	for quarrying, hauling and laying 75 perches of stone for grinding mill.
Edward Harding:				
12013	60A	Nov. 7, 1827	\$263.00 7.00	for 320 perches and 24 feet of stone laid at the grinding mill and the building for the use of the machinery for halfstocking+ \$ 7.00 for quarrying and laying 14 perches of stone for the grinding mill.
Michael Walsh(perhaps):				
11622	157A	Sept. 7, 1827	\$ 63.00	for mason work, laying 64½ perches of stone wall at the tail race= \$ 48, 37½+ \$ 14.62½ for digging 117 cubic yards of earth at tail race.
Philip Coons:				
12013-	47B	Nov. 1, 1827	\$ 7.50	for use of his cart & horse, removing earth excavated from tail race of new grinding mill.

The mason Edward Harding's voucher indicates that the addition was constructed of stone. On completion of the addition in 1827, the old grinding mill was turned over to John H. Hall for his use in manufacturing rifle.

Armory Expenditures for new buildings along the Shenandoah, 1822-29		Expenditure
1821:	4 workshops valued at \$ 11,500.00	
1822:	new store house for stone coal, one story, probably stone	\$ 200.00
1824	Store House for bar iron, stone building. A lodging room for workmen fitted up on second floor in 1826.	500.00
1827:	Addition, stone wing, with new head race & tail race, added to grinding mill.	1.500.00
1828:	Wooden bridge(one-third cost)	333.00
Total:	two new store houses, plus addition to workshop	\$ 2,533.00

Value of Hall Island Plant in 1829: \$ 14,033.00.

B. Repairs and Improvements, Captain John H. Hall's Rifle, 1822-1829:

Captain John H. Hall's efforts to manufacture his patent rifle on the Lower Hall Island was regarded as purely an experiment from 1819 to 1827, hence his expenditures for new buildings and millwright work during these years was held to a minimum and the buildings that were erected were built as cheaply as possible. According to the Ordnance Department Accounts, Hall's total construction program from 1822 to 1826 only totalled \$ 2,856.39. Unfortunately the Armory's annual reports to the Ordnance Department for the years 1822 to 1826 fail to describe the new structures that were erected by Hall. Much of this missing information, however, can be reconstructed from the Armory Paymaster's vouchers that he issued to pay the workmen who made the repairs and improvements at the Hall Rifle Factory. These indicate that \$ 28.00 was spent for mason work repairing the brick and stone work shops in 1823:

In 1824 a total of \$ 1,307.40 was expended as follows: \$663.60 for carpenter work "for finishing building for making patent rifle; \$ 328.80 for mason work which included quarrying, hauling and laying of 283 perches of stone in a wall and tail race, and for excavating 229 cubic yards of pit for the new forebay of "the building occupied for the manufacture of patent rifle." This suggests that Hall's machine shop (the 1807 Armory sawmill remodelled) was further enlarged in 1824. Also spent in 1824 was \$ 315.00 for "millwright work" for "shop occupied for making patent rifle."

The vouchers documenting the 1823-1824 construction will be found on the following page.

CONSTRUCTION PROGRAM AT THE HALL RIFLE FACTORY, 1823-1824:

R.G. 217: Voucher					
File	No.	Artisan	Date	Amount	Remarks
7624	50B	Richard Barry	Nov. 29 1823	\$28.00	For 16 days mason work repairing brick and stone workshops on the Shenandoah.

1824:					
8371	32B	Joel Downey	8/17/24	\$ 38.80	10 days carpenter work finishing building for making patent rifle
8371	97A	" "	9/13/24	\$ 83.00	for 23 days work-self and 3 journeymen fittingup & repairing building for making rifles.
8371	124A	" "	9/30/24	131.40	4 carpenters " " " " " "
8693	25A	" "	10/26/24	111.60	4men on rifle factory shop.
8693	69A	" "	12/18/24	162.20	4 men " " " " " "
8693	81A	" "	12/31/24	136.60	4 men " " " " " "
Subtotal		Josel Downey	1824	\$ 663.60	Rifle Factory shop.
8693	72A	John McNulty	12/18/24	\$328.80	Mason work, for quarrying,hauling and laying 283 perch stone in a wall for forebay & tail race at the building occupied for the manufacture of patent rifle= \$ 283.00+ \$ 45.80 for removing 229 cubic yards for the pit of the new forebay.
8371	103A	John Lowstetter	Sept. 14 1824.	\$107.00	Millwright work-for making one shaft 18 ft. long for shop occupied for making patent rifle= \$ 67.00+ \$40.00 for making one water wheel 10 ft. in diameter for same shop.
8683	49A	John Lowstetter	12/3/24	\$ 208.00	For 103 days work of self and journeymen on workshop of the patent rifle plant.

Subtotal		J. Lowstetter	1824	\$ 315.00	
Total 1824:				\$ 1,307.40	

During 1825 a total of \$ 687.40 were spent on Hall's buildings. This included \$ 173.55 for carpenter work and \$ 172.80 for millwright work(new machinery) in "workshop occupied for patent rifles" in March and April 1825, thus suggesting that the work was being completed on Hall's machine shop that had got underway in 1824. A log house was also erected as a residence for one of Hall's workmen in April 1825 at a cost of \$ 102.75. This edifice was probably located on the Upper Hall Island. 31,509 bricks were made and it

cost \$ 31.59 to transport them to erected a brick workshop at the rifle factory in March 1825. In the spring of 1825 \$ 51.71 was spent to construct a kiln for steaming rifle stocks. Probably built of brick, the foundations contained 60 perches of stone. Also constructed, utilizing 27,500 bricks, was a "small workshop and two annealing furnaces on the Shenandoah for the manufacture of Patent Rifles" in September 1825. (See following page for these voucher). Also constructed in July 1825 at a cost of \$100.00, was a well "for use of the works on the Shenandoah."

Finally, and not included in the above total for 1825, was \$ 10.10 paid to Horatio Mitchell on August 24, 1825 for repairing the plaster and hearth¹ in Captain John H. Hall's dwelling house.

The vouchers for 1826 indicate that a total of \$222.30 was spent for making repairs and improvements at Hall's works, but it is not possible to identify the structures on which the repairs were made, except for one: Neal Christy received \$ 11.12 on March 31, 1826 for "44 $\frac{1}{2}$ perches of stone for² building a smoke house for Mr. Hall.

Total expenditures for repairs and improvements at Hall's Rifle Factory from 1822 to 1826, according to the above voucher, amounted to \$ 2,033.92.

1. National Archives Record 217 File 9310, Voucher 50A, August 24, 1825.
2. R.G. 217, File 9851, Voucher 27A.

CONSTRUCTION PRORGAM AT THE HALL RIFLE FACTORY, 1825:

1825 File	Voc. No.	Artisan	Date	Amount	Remarks
9057	56A	Joel Downey	3/3/25	\$ 94.35	For 13½ days carpenter work+ 55½ day work by journeymen on rifle factory shop.
9057	27A	" "	4/19/25	\$ 79.20	For 64 days work by 4 men " "
Subtotal		Joel Downey	1825	\$ 173.55	
9057	51A	Richard Hurdle	4/20/25	\$ 102.75	For carpenter work building a log house for a workman of the rifle factory.
9057	69A	John Lowstetter	3/4/25	\$ 172.80	for 108 days work making new machinery in work shop occupied for patent rifles. Millwright.
9057	15A	Philip Strider	3/3/25	\$ 31.59	for hauling 31,509 brick from his brick yard to armory for building a workshop for manufacture pat.Rifle.
9057	94A	Michael Walsh	5/13/25	\$ 32.25	for laying 60 perches of stone in the foundation of a kiln for steaming rifle stocks & 3 days work digging foundations for same.
9057	54A	John Coulters	3/3/25	\$ 19.46	for 9½ days mason work building a kiln for steaming patent rifles.
9310	16A	Patrick Landragon	8/1/25	\$ 100.00	For digging a well for use of the works on the Shenandoah.
9310	133A	George Henry	9/28/25	\$ 55.00	for laying 27,500 brick in small workshop and two annealing furnaces on the Shenandoah for manufacture of Patent rifle.
Subtotal:			1825:	\$ 687.40	

Total: 1822 to 1826: \$ 2,033.92.

As has been noted, \$ 1,653.75 of this total was spent in 1824-25 to enlarge Hall's one-story frame machine shop, the former Armory saw mill. The money went for the following work on the machine shop:

Hall's Machine Shop Improvements, 1824-25	
Services	Cost
Carpenter work	837.15
Mason Work:	328.80
Millwright work:	487.80
Total:	\$ 1,653.75

In 1825 a small kiln for steaming rifle stocks, a small brick workshop, and two brick annealing furnaces were erected. Hall's Factory in 1825 was thus apparently comprised six workshops, including the enlarged machine shop and the 1819 blacksmith shop.

The Second Hall Contract, 1827:

In 1827 Hall's experimental status changed dramatically: In that year his patent rifle passed a series of extensive tests by the Ordnance Department with flying colors. The United States, accordingly, entered into a new contract with Hall; a greater number of his rifles were to be produced and therefore his plant of three workshops, a kiln, and two annealing furnaces had to be expanded in order to increase production.

Colonel George Bomford notified Acting Superintendent Roswell Lee of these decisions on March 16, 1827, writing:

It has been determined to proceed with the manufacture of Hall's rifles and upon a more extensive scale than hitherto. It is proposed that the operations connected with fabrication of these rifles shall be predicated upon a scale that will be equal to the annual fabrication of about three thousand.....

To meet these objects the following outline is suggested; as the course most likely to answer the ends in view. First that adequate shop room be set apart for the fabrication of rifles the control of which is to be vested in Mr. Hall. Any extensions or repairs of building is however to be first approved by the Supt. and the work to be executed under his direction." 3

The Chief of Ordnance further directed Supt. Lee to turn all of the old Armory grinding mill on the Hall Island over to Hall for the

inventor's use and to also provide an additional smith shop large enough to house four fires and forges. Lee was to construct such a one-story shop if no smith shop was available. 4

3. Bomford to Lee, March 16, 1827- Reel 14, V. 4, p. 498.

4. Ibid.

On June 14, 1827, Supt. Lee informed Col. Bomford that a one-story smith shop for four forges, 35 feet square, and also a new trip hammer shop, one-story, and 45 feet square, were in the process of being constructed at the Rifle Factory for the use of John H. Hall.⁵

National Armory Accounts for the years 1827 to 1829 show the following expenditures for repairs and improvements at the Rifle Factory (exclusive of Armory or Musket Factory) Accounts:

Year	Expenditure ⁶
1827	\$ 5,751.00
1828	\$ 5,665.93
1829	\$ 3,425.96
Total:	\$ 14,842.89

With total of \$ 2,856.39 that had been expended during the years 1822-26 included, the grand total of expenditures for repairs and improvements at the Hall Rifle Factory, 1822-29 came to \$ 17,699.28.

Total expenditures for these purposes from 1819 to 1829 came to about \$ 21,560.72. With the Armory expenditures of \$ 2,533.00 for repairs and improvements included (exclusive of Hall's items), the grand total spent for repair and improvements on the Hall Island from 1822 to 1829 came to at least \$ 20,232.28.

5. Lee to Bomford, June 14, 1827, Reel 22, Vol. 1, p. 62.

6. National Armory Account, Entry 935, National Archives Record Group 156.

Statement of the Amount expended in the manufacture of the first and second parcel of Hall's Rifle, from the commencement in 1819, to 1828, when completed

Year	For bldgs., repairs & millwright work	For tools and machinery	for rifles manufacturing	John H. Hall's salary	for patent right payments	TOTAL
1819	\$ 3,748.40	987.02	2,402.72	480.00	1,000.00	8,618.14
1820	121.04	5,988.08	4,097.38	820.00		10,926.50
1821	-	3,999.43	2,327.72	720.00		7,047.15
1822	42.18	4,521.15	1,172.96	720.00		6,456.29
1823	37.44	5,500.10	3,492.04	720.00		9,749.58
1824	1,518.66	11,744.77	5,466.57	720.00		19,450.00
1825	1,035.81	13,892.82	3,251.37	720.00	1,000.00	19,900.00
1826	222.30	7,531.10	3,761.60	720.00		12,235.00
1827	-	-	5,221.34	200.00		5,421.34
1828	-	-	1,084.33	-		1,084.33
TOTAL	6,725.83	54,164.47	32,278.03	5,720.00	2,000.00	100,888.33
Personal service of J.H. Hall	-	2,912.35	2,807.65	-	-	-
Total	6,725.83	57,076.82	35,085.68	-	2,000.00	100,888.33

Source: National Archives Record Group No. 156=Entry 935- National Armory Accounts, 1795-1829.

Construction at the Hall Rifle Factory, 1827-29.

The Annual Reports of Armory Operations for the period 1827-29 fail to describe the repairs and improvements that were being made at the Rifle Factory plant and it is again necessary to turn to the vouchers of the Armory Paymaster to discover this type of information.

On April 23, 1827, John H. Hall and Lewis Wernwag entered into an contract under which Wernwag was to do millwright work and erect buildings for Hall on the Lower Hall Island. Wernwag, who described himself as "a Bridge Builder", owned a machine shop and saw mill located on the Island of Virginus, and also did carpenter, mason, and millwright work. Under the April agreement, Wernwag was to do the millwright work on the new addition being made to grinding mill

by the armory for the use of Hall(see page 18 - the cost of construction of this stone addition came to \$ 1,500.00).

Wernwag was to make a shaft 18 feet in length and 23 inches in diameter for \$ 40.00, also water wheel of 10 feet in diameter with seven feet 1 length of bucket, a cogwheel, head blocks, spurs, forebay, shute, and gates for the addition. The bridge builder completed this phase of his contract, namely "erecting the new water wheel, forebay and necessary fixtures for new mill shop of John H. Hall" and was paid \$ 336.00 under the terms of the agreement.

1. A copy of this agreement is in R.G. 217- 2nd Auditor's Account, 1st Series, File 12013.
2. R.G. 217- File 12013- Voucher 16A, dated October 18, 1827.

In the April 23, 1827 agreement, Wernwag further engaged "to furnish the Masonry for a Smith Shop, for the U. States, and for a Store House for the Same at \$ 1.25 per perch, providing all the Materials at his own expense, Stones, Lime, Sand, &c. - laying the whole in Mortar and pointing the same..."³

Wernwag began construction in early May and by the 26th of that month had completed the crib for the foundation of a smiths shop that was to be 35 feet square.⁴ He erected approximately 481 perches of stone masonry wall in this work shop and was paid about \$ 965.04 for his work on this structure.⁵ The total value of his work for Hall during 1827, including the millwright work on the grinding shop, came to \$ 1,435.33. On October 24, 1827, William Bayley was paid \$ 194.25 for slating the roof of the new smiths shop, 18½ squares of slate.⁶ The four chimneys for the four forges in the smiths shop⁷ were constructed by George Randall in September at a cost of \$ 60.00. The carpenter work on the smiths shop and also the store house for coal was performed by Michael Foley, who was paid a grand total of \$ 370.00⁸ for his work. Charging \$ 185.00, half his work to the smiths shop, the approximate total cost of this work shop would appear to be about \$ 1,404.29.

Apparently Wernwag was unable to construct the storehouse for coal and was released from the terms of the agreement. The mason Edward Harding was paid \$ 285.78 for laying about 506 perches of mortar stone walls for the store house for coal.⁹ Michael Foley did the carpenter work on the

3. R.G. 217- File 12013- p.3 of contract.

4. f.11622- 26A.

5. See Chart A, Wernwag, files 11127-88B to 11622-201A inclusive.

6. Ibid., Chart A- F. 12013-V.26A.

7. File 11622 -V.200A- Sept. 29, 1827.

8. Chart A.

9. Chart A- see Edward Harding.

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5. See Chart A, Wernwag, files 11127-88B to 11622-201A inclusive.

6. Ibid., Chart A- F. 12013-V.26A.

7. File 11622 -V.200A- Sept. 29, 1827.

8. Chart A.

9. Chart A- see Edward Harding.

store house for about \$ 185.00 William Bayley was paid \$ 185.85 on August 14, 1827 for slating the roof of the new storehouse for coal, 17 7/10 squares¹⁰ of slate. Cost of the new coal house, exclusive of the price of the stone, came to about \$ 656.63/.

John H. Hall also received permission to erect a dwelling house¹¹ for his own use in 1827. Work on this project apparently got underway in October and November, after the construction of the other new buildings had been completed. Patrick Redman and mason George Randall were paid a total of \$ 178.30 for excavating 189 cubic yards and laying 83½ perches of stone wall in the foundations of Hall's new dwelling in the fall of 1827.¹²

Of the total of \$ 5,751.00 reported expended for repairs and improvements at the Rifle Factory by Hall in 1827, vouchers for labor and the services of artisans came to \$ 3,171.38 and those for materials totaled \$ 1,711.52(See Charts A and B), leaving only about \$ 868.09 not accounted for in the vouchers checked.

The Paymaster's vouchers for the 1st and 2nd quarters of 1828 are missing from the National Archives files. Of the \$ 5,665.93 reported expended during 1828 for repair and construction, only \$ 598.15 was spent during the 3rd and 4th quarters of that year(See Chart C, p.33). Hall's new house was largely completed during 1828; the 45 foot square tilt hammer shop, proposed in 1827, may also have been erected in 1828. In December a belfrey was erected on the roof of Hall's(1808-09)Grinding Mill to call¹³ his employees to work. Four squares of the roof of the " Drilling and Boring

10. File 11622-V. 59A.

11. File 11622-V. 34A- On a voucher dated July 30, 1827- for 3,206 feet of timber at \$ 48.09 for Hall, the Armory Paymaster had noted: Mr. John H. Hall has a special authorization to put up for himself a dwelling house for his own use."

12. File 12013- V.9A to Redman, and F. 12013-V.148 to Randall, see Chart A.

13. File 12579-V. 28A, Dec. 19, 1828- To John Markell, \$ 82.24.

Expenditures at the Rifle Factory for Services and Labor for
Construction of Storehouses and Work Shops, 1827 : R.G. 217

File No.	Voucher No.	Artisan	Date	Amount	Remarks
11127 11622	169B 62	Michael Foley "	6/22/27 8/11/27	\$ 50.00 200.00	for carpenter work on new buildings for J.H. Hall.
11622 12013	164A 18A	" " "	9/12/27 12/20/27	50.00 70.00	carpenter work on Hall's new Store House & Smiths Shop.
Subtotal:		Michael Foley	1827	\$370.00	Store House & Smiths Shop
12013	19A	Michael Cook	10/27/27	\$ 57.75	For use of Cart & horse for 38½ days at Rifle Works.
11127	41A	Edward Harding	5/5/27	\$ 50.00	for laying 100 perches of stone wall in Hall's new store house, Rifle Factory.
11127	91A	" "	5/22/27	\$ 127.37	For laying 254 3/4 perches of stone wall.
11117 11622	152B 18A	" " "	6/15/27 7/19/27	75.62 32.79	for 151½ perches of stone work for erectin the waklie(/) cornice for a new store house for coal for J.H. Hall.
Subtotal:		Edward Harding	1827	\$ 285.78	Store House for Coal
11622 11622	74B 199A	John McNulty "	8/16/27 9/30/27	\$ 3.00 20.06	for 3 days of mason work at furnace.
11622	219A	" "	9/29/27	\$ 200.29	Mason work, 57 1/3 perches stone wall laid for Hall.
12013	12A	" "	11/14/27	35.20	For 129 perches stone wall for \$ 193.50; for 7 7/8 pr. of stone=\$ 1.78+ 17 1/3 perch of stone for \$ 5.01. For J. H. Hall.
Subtotal:		John McNulty	1827	\$ 258.55	For repairing stone wall at tail race, mason work.
11127 11622	203A 183A	George Randall "	6/30/27 9/15/27	\$ 69.00 \$ 63.25	186 1/3 perch stone wall + 25 perches of stone.
11622	200A	" "	9/29/27	\$ 60.00	for 3 masons erecting stone walls for Hall's smith shop
12013	148	" "	10/18.27	\$ 114.93	For 193 perch dry wall @\$48.2 + \$15.00 for 45 perch mortar wall for Hall.
Subtotal:		George Randall	1827	\$ 307.18	For erecting four chimneys for Hall's (smith shop with four forges).
11622	53A	Michael Morgan	8/14/27	?	For 83½ perches of stone wall 8 stone steps, for addition J.H. Hall's dwelling house.
12013	9A	Patrick Redman	11/10/27	\$ 63.37	Smiths Shop & Dwelling
					Mason work, 70 feet of cornice for use of John H. Hall.
					Digging 189 cubic yards, quarrying 83½ perch stone. 5 stone steps of foundation of addition to J.H.Hall's house.

chart A - 1827

Expenditures at the Rifle Factory for Services and Labor to
Construct Stores Houses and Work Shops for J.H. Hall, 1827.

File No.	Vouch. No.	Artisan	Date	Amount	Remarks
11622	59A	William Bayley	8/14/27	\$ 185.85	For slating new store house of John H. Hall, 17 7/10 square of slate.
12013	26A	" "	10/24/27	\$ 194.25	For slating new(Smiths)shop of J.H. Hall, 18½ squares.
Subtotal:		William Bayley	1827	\$ 380.10	Coal House & Smiths Shop.
11127	39A	Lewis Wernwag	5/5/27	\$ 134.49	For 145 perch.stone wall= \$ 108.75; 45 3/4 perch.wall for \$ 22.87+ \$ 2.87 for 23 cubic yds.of filling,for John H. Hall.
11127	88B	" "	5/21/27	\$ 135.52	For 342 2/3 yds excation and 27½ perch of stone wall
11127	104A	" "	5/26/27	\$ 79.05	For making crib,for foundation of Smiths Shop 35 feet square at Hall's works.
11622	26A	" "	7/26/27	\$ 251.75	For 207 perches stone wall in smiths shop at \$ 191.75+ \$ 60.00 for excavation for same.
11622	103A	" "	8/22/27	\$ 263.75	For laying 211 perch of stone wall for use of J.H.Hall.
11622	159A	" "	9/7/27	\$ 64.40	For 35½ perch of stone work for new Hall workshop.
11622	201A	" "	9/29/27	\$ 170.57	For plaster & stone work for John H. Hall.
12013	16A	" "	10/18/27	\$ 336.00	For erecting new water wheel,forebay and necessary fixtures for new mill shop of John H. Hall,under contract
Subtotal		Lewis Wernwag	1827	\$ 1,435.33	Smith Shop & Grinding Mill
TOTAL: SERVICES AND LABOR			1827	\$ 3,171.38	Coal House, Smiths Shop, Grinding Mill & Addition to Hall's Dwelling House.
For Building Materials			1827:	\$ 1,711.53	
GRAND TOTAL:			1827	\$ 4,882.91	

CHART B -1827

32

EXPENDITURES FOR BUILDING MATERIALS TO BE USED AT HALL'S
RIFLE FACTORY in 1827 R.G. 217

File No.	Voucher No.	Purchased From	Date	Amount	Material and Remarks
11622	40A	John E Palmer	8/3/27	\$ 36.97	5,252 brick .
11622	156A	" " "	9/7/27	\$ 35.00	5,000 brick.
11622	216A	John E. Daley	9/27/27	\$ 44.15	4,850 brick
Subtotal: Brick			1827	\$ 116.12	15,102 brick
11622	216A	John E. Daley	9/27/27	230.57	Other materials
11127	19A	Joseph B. Dust	7/19/27	16.00	80 bushels of lime.
Lumber:					
11622	110A	Philip Coons	8/27/27	78.15	5,210 ft.pine board.
11622	135A	Abraham Kline	9/3/27	64.45	5,156 ft. 1 inch pine plank.
11622	234A	Lewis Wernwag	8/30/27	48.09	3,206 feet of timber & scantling.
11622	45A	Lewis Wernwag	9/7/27	72.05	4,649 ft.of rafters, joists & griders.
Lumber:					
				\$ 262.74	18,221 feet
Stone, timber, scantling:					
11127	116A	Lewis Wernwag	5/10/27	\$ 159.34	160 perch stone & timber.
11127	175A	Lewis Wernwag	6/23/27	\$ 238.96	175½ perch stone & scantling
11622	185A	Lewis Wernwag	9/15/27	\$ 144.75	quarrying & delievering 193 perches of stone.

Stone and scantling:				\$ 543.05	528½ perches
Total for Building materials:			1827	\$ 1,711.53	

Expenditures for Services and Labor for the Construction of Buildings and the Rifle Factory, 1828 : R.G. 217:

File No.	Vouch. No.	Artisan	Date	Amount	Remarks
Records for the 1st and 2nd Quarters of 1828 are missing;					
12579	43A	Michael Foley	11/15/28	\$ 72.55	For 66 days carpenter work & making 1 venetian door, John H. Hall's dwelling house.
12579	106B	Philip Coons	12/9/28	\$ 19.46	For use of cart & horse in hauling sand, water, and brick to dwelling of John H. Hall.
12579	62A	John E. Palmer	11/24/28	\$ 21.00	\$ 10.50 for 1,500 bricks; \$9.50 For 9 days laying same at Hall's dwelling house.
12579	122A	Lewis Wernwag	12/12/28	\$ 163.90	For 1,820 feet of lumber for use at the rifle factory.
12579	111B	Isaac Marge	12/12/28	\$ 49.00	For 24½ days work make forebay, shute and gate at rifle factory
12579	60A	Henry Hay	11/21/28	\$ 16.04	For glazing 165 lights of sash at John H. Hall's house.
12579	59A	James Gallaher	11/21/28	\$ 50.00	For plastering 400 square yards 2 coats, at J.H. Hall's House.
12579	136A	James Steele	12/24/28	\$ 42.00	For slating 4 squares of roof of the Drilling and Boring shop at the rifle factory.
12579	83,84,85,86, and 112A		12/4 and 12/28	\$ 82.26	For transportation of 1,809 lbs of slate from Georgetown, D.C. to Rifle Factory.
12579	28A	John Markell	12/19/28	\$ 82.24	For furnishing materials & erecting a belfrey as per agreement at rifle factory=\$ 80.00+ \$ 2.24 for 2 days carpenter work
TOTAL, 3rd and 4th Quarters of 1828:				\$ 598.15	Hall's Dwelling, Bell shop, &c.

14

"Shop" were slated in 1828. What new shops, if any, that may have been erected during the 1st and 2nd quarters of 1828 is not known.

14. R.G. 217-File 12579, Voucher 136A, to James Steele, see Chart C, above.

During 1829, a total of \$ 3,425.96 was reported as having been spent for repair and improvements at the Rifle Factory. The Paymaster's vouchers for labor and the services of artisans in 1829 at the Hall plant total \$ 1,088.32 (See Chart D, p.35) and reveal that no new buildings were erected for Hall during that year. Slating was a major item, \$ 608.96 was expended for slating 55 36/100 squares of rifle factory roofs. Making 23 pair of blinds, 20 for the workshops and three for Hall's residence, at a cost of \$ 121.50.

Also build during this period, probably in 1828, were two more dwelling houses for the use of Hall's workmen, so that the Captain and his employees occupied a total of seven residences in 1829.

15. File 12908-V. 32B, To William Bayley, Jan.1,1829-Chart D.
16. File 13478- V. 47A and 165B, to James Foley-see Chart D.

Expenditures for Services and Labor to erect Buildings at the
Hall Rifle Factory in 1829: R.G. 217-

File No.	Vouc No.	Artisan	Date	Amount	Remarks
12908	87A	John E Palmer	3/31/29	\$ 28.00	For 4,000 brick for the rifle factory.
13478	33A	Jonathan Painter	4/30/29	\$ 42.40	Mason work, laying 60 perch of stone wall at Hall's rifle factory.
13478	72B	Isaac Marge	5/9/29	\$ 136.40	For carpenter work at rifle factory= making a tight trunk for conveying water to machinery. Turnk 3 feet square and 84 feet long.
12908	15A	James Gallaher	1/15/29	\$ 74.92	For plastering 599½ square yards at house of John H. Hall and rifle factory buildings.
12908	32B	William Bayley	1/29/29	\$ 608.96	Furnishing slating and slating 55 36/100 squares of roof at rifle factory.
13478	47A	James Foley	5/5/29	\$ 75.00	Carpenter work, making blinds for use at Hall Rifle Factory: 17 paid blinds, 15 lights each=\$68.00 1 pair blinds, 12 lights 3.50 2 pair blinds, 4 lights each 3.50
13478	165B	" "	6/12/29	\$ 46.50	Carpenter work on John H. Hall's House: 1 pair blinds with 15 lights @ \$ 4.00; 2 pair blinds with 2 light @ 6.00; put lights in garret window-.50; make 6 tool cases=\$36.00.
Subtotal:		James Foley	1829	\$ 121.50	
13626	3A	Henry Hay	7/18/29	\$ 61.13	Painting at the rifle factory.
13626	21A	Lewis Wernwag	8/18/29	\$ 15.00	For making a road running from the rifle works up the Camp Hill for use of employees of works, 15 days work.
TOTAL:			1829	\$ 1,088.32	

EXPENDITURES FOR REPAIRS AND IMPROVEMENTS AT THE HALL RIFLE
1822 to 1829, and also by Armory for its Buildings on the Hall Island

RIFLE FACTORY							ARMORY		TOTAL
Year	New Bldgs.	Cost	Wells	Bridge	Repair	R.F. Total	New Bldgs.	Cost	
1822	0	0	0	0	\$ 42.18	\$ 42.18	1	\$ 200.00	\$ 242.18
1823	0	0	0	0	37.44	37.44	1	\$ 500.00	537.44
1824	0	1,307.16	0	0	211.26	1,518.66	0	0	1,518.66
1825	5	587.65	100.00	0	384.41	1,035.81	0	0	1,035.81
1826	0	11.12	0	0	211.18	222.30	0	0	222.30
1827	2	3,161.38	0	0	868.09	5,751.00	1	1,500.00	7,251.00
1828	1		0	0		5,665.93	0	0	5,665.93
1829	0		0	0		3,425.96	0	0	3,425.96
TOTAL	8	5,067.31	100.00	0	1,754.47	\$ 17,699.28	2	2,200.00	\$ 20,232.28

1822- Coal House for Armory

1823- Iron storehouse for Armory

1824- Large addition to John H. Hall's machine shop.

1825- Kiln for straining rifle stocks., Rifle Factory.

1825- Two brick annealing furnaces, Rifle Factory

1825- small brick work shop for rifle factory.

1825- log dwelling house for Hall workman.

1827- large addition to grinding mill by Armory. (To be turned over to Hall).

1827- Smith shop for rifle factory.

1827- Coal House for rifle factory.

1827- Hall's machinery for addition to grinding mill.

1828- Tilt Hammer shop for rifle factory.

1828 -possibly two new dwelling houses erected for Hall Workmen, making total of seven for Hall and his men.

Cost of Bridge to Island, 1828: \$ 1,000.00. ++
Cost of Well on Island: \$ 100.00.

++ Bridge perhaps to Virginus Island, which was being developed in 1828.

Buildings on the Lower Hall Island in 1829:

The workshops and storehouses standing on the Lower Hall Island in 1829 probably totalled approximately 13 buildings. These included:

a. Used by the Armory:

1. Tilt Hammer Shop, one-story, brick, 45 by 45 feet, built in 1808-09.
2. The Coal House, probably stone and one-story, cost \$ 200.00, erected in 1822.
3. Store House for Iron, erected in 1824, cost \$ 500.00. A stone building, one and one-half or two stories in height. Lodging room fitted out over iron house for use of workmen in 1826, Cost \$ 10.00.

b. John H. Hall's Workshops:

4. The Machine Shop (altered from the 1807 sawmill in 1819, one-story, frame, 15 by 50 feet, with one water wheel.) greatly enlarged and improved in 1824 at a cost of \$ 1,653.75. Shop had two water wheels after 1824 addition, one of 10 and the other of 12 feet in diameter. Hall Bldg. 1.
5. Smiths or Forging Shop. Two-story, stone blacksmiths shop, erected in 1819. 30 by 30 feet. Cost, \$ 1,000.00. Hall Bldg. No. 2.
6. Brick Workshop, small one-story brick shop, erected in 1825. Probably Hall's Bldg. No. 3.
7. Smiths Shop with four forges. One story, stone building, 35 by 35 feet. Had four chimneys, Erected in 1827 at approximate cost of \$ 1,400.00. Probably Hall's Shop. No. 4. Slate Roof.
8. Grinding Mill (erected 1808-09), one-story brick shop with water wheel, 85 by 40 feet. Structure greatly enlarged in 1827 by the addition of a stone wing at a cost of \$ 1,500.00. A second water wheel, 10 feet in diameter, was installed in the addition in 1827 at a cost of \$ 336.00. This was probably Hall's Shop. No. 5. A belfry or cupola was added to the roof of this shop. The Armory turned this structure over to Hall in 1827.

9. Tilt Hammer Shop, One story, stone, 45 by 45 feet, built in 1828.

This is probably Hall's Shop No. 6. Probably had a slate roof.

10. Kilm for Steaming Rifle Stocks, small structure with stone foundations and probably brick walls, erected in 1825; cost about \$ 51.71.
11. Annealing Furnace, brick, built in 1825. Small.
12. Annealing Furnace, brick, built in 1825. Small.
13. Storehouse for Coal, stone building with slate roof, cost about \$ 656.63, erected in 1827.

Captain Hall and his men resided in seven Armory dwelling houses in 1829. Six of these were located on the Hall Islands, probably the Upper Island. These included the following edifices:

1. Stone dwelling house, built in 1819(Probably Hall's House No.13).
2. Stone dwelling house, built in 1819(probably Hall's House No. 14)
3. Stone dwelling house, built in 1819(probably Hall's House No. 15)

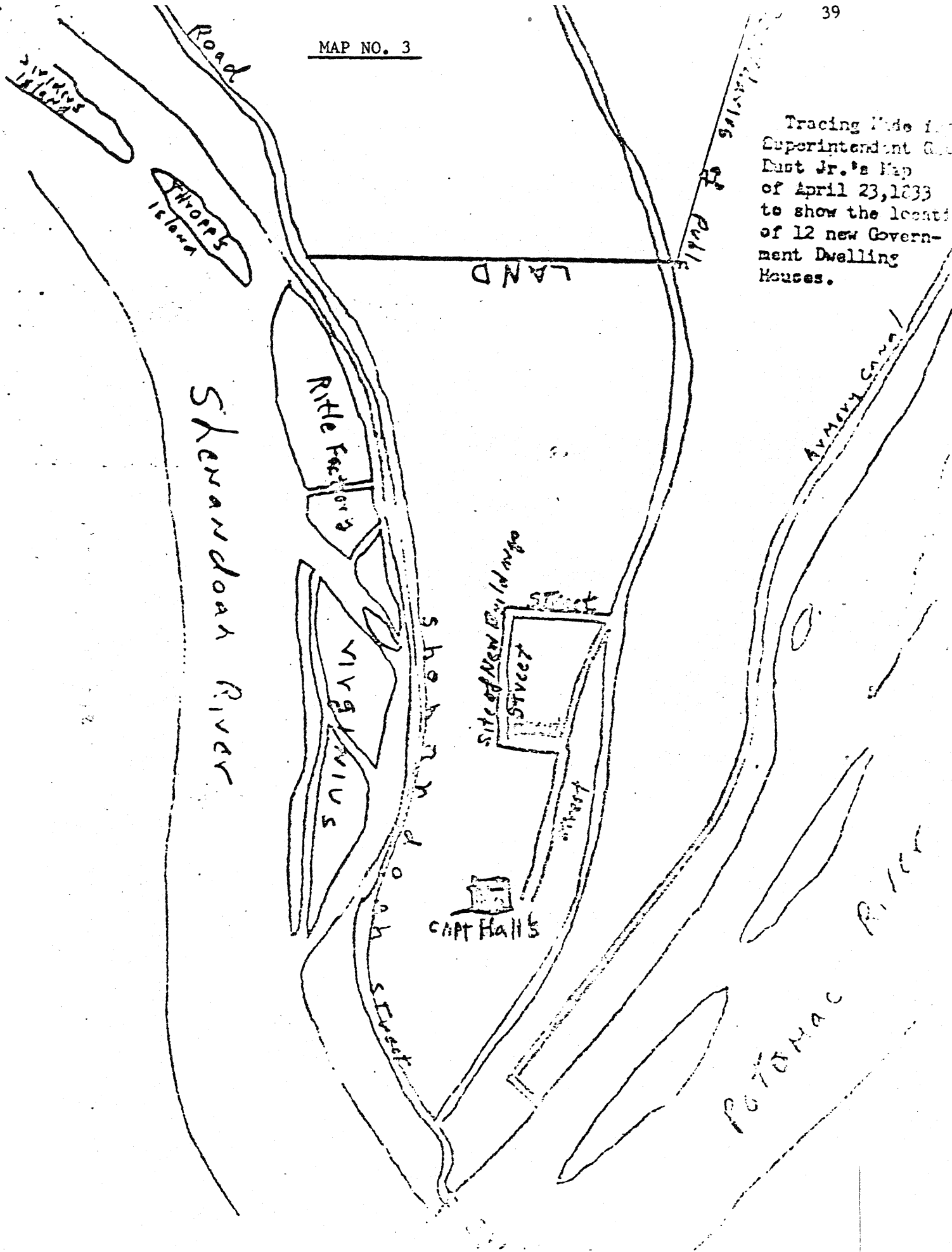
These three stone house were erected at an approximate cost of \$ 1,350.00.

4. Log dwelling house built in 1825, Co \$ 102.75(Probably Hall's Bldg. No. 16).
5. dwelling house, probably erected in 1828(Probably Hall's Bldg No. 17).
6. Dwelling House, probably built in 1828 (Hall's Bldg. No. ?).

In 1827-28 a much larger and better residence for Captain John H. Hall was built on Camp Hill at the site presently occupied by Park Bldg. No.56(the Paymaster's New Quarters-Armory Dwelling House No.32, that was to be erected in 1847-48). The location of Captain Hall's new house is shown on Map No. 3(1833), which follows. Hall's new residence was a two-story brick house on stone foundations. Carried on the Armory Rent rolls after 1841 as Armory Dwelling No. 164, the structure was valued at \$ 2,500. Also built was a one-story stone stable about 25 feet square. Hall's house was demolished in 1848, but the stone stable stood to 1861.

MAP NO. 3

Tracing Made for
Superintendent G. L.
East Jr.'s Map
of April 23, 1833
to show the location
of 12 new Govern-
ment Dwelling
Houses.



The Shenandoah Canal, 1822-1829:

As has been mentioned, the Shenandoah Canal, running through the Upper and Lower Hall Islands, with a set of upper and lower locks, had been built by the Potomac Company in 1806-07 and had made this land into a island.

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 G, page 41), 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.

SHENANDOAH CANAL PROJECTS, 1823 -24

CHART G

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 156 perch stone in 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 stone river 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- EMBANKMENT PROJECTS 1824				\$ 2,430.50	

EXPENDITURES ON THE SHENANDOAH CANAL,
1822 - 1829

Year:	Shenandoah Canal
1822	-
1823	2,279.00
1824	160.00
1825	
1826	60.83
1827	
1828	
1829	
TOTAL:	\$ 2,500.33

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.

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	

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

Construction and Repair at the U.S. Rifle
Factory, Halls Island on the Shenandoah, 1830-35

The report of William B. Lewis, 2nd Auditor of the Treasury Department, dated November 16, 1835, indicates that \$ 9,080.61 was spent for repairs and improvements on the buildings at Hall's Rifle Factory and \$ 1,999.50 to repair and extend the Shenandoah Dam, making a grand total of \$ 11,080.11 spent for permanent improvements, exclusive of the purchase of water rights, during the years 1830 to 1834.

This chart which follows is based on Auditor Lewis's report: ¹

Year	Water Rights and dams	For Buildings	Tool and Machinery	Total Perm. Improvements	
1830	-	\$ 887.45	\$ 10,671.85	\$ 11,569.30	
1831	-	2,491.27	9,355.78	11,747.05	
1832	-	3,837.40	12,100.76	15,938.16	
1833	\$ 2,600.00	968.62	1,883.60	5,452.22	
1834	1,999.50	895.87	4,744.32	7,639.69	
Subtotal	\$ 4,599.50	\$ 9,080.61	\$ 38,756.31	\$ 52,436.42	(1)
1835:	-			5,788.03	(2)
TOTAL:	\$ 4,599.50			\$ 58,224.45	

Total for land, dams, and buildings, 1830-34: \$ 13,680.11.

1. Congressional Series, Serial No. 287, Document 44, p. 366; also in American State Papers-Military Affairs, V, p. 915.
2. Serial No. 292, Document 294, p. 5. Annual Report of Ordnance Department to Congress for 1835.

In July 1830, John H. Hall informed Chief of Ordnance George Bomford that his operations now needed the one remaining Armory-operated shop at the rifle factory, writing:

The progress of my business now renders it necessary that the remaining water shop on the Shenandoah, should be given up to me, as contemplated for several years past, it is a one story brick building in defective state, in which two tilt hammers are now worked and a forge hammer, the later for the furnace.

The stocking of my rifles, which cannot be longer delayed without serious inconvenience (nine thousand also -3d and 4th parcels [of rifle]) renders it necessary that the whole of the water power in the Shenandoah Canal should be at my command, as it will be, when the tilt hammer shop is given up and the furnace. I would therefore request that provision be commenced for the delivery of it as early a day as practicable." 3

This transfer of the old brick forge and furnace took place a year later, in June 1831. 4 Hall reported that that old shop was in very poor condition, but estimated that it could be repaired and converted to his needs for about \$ 1,500: one section at a cost of \$ 1,000

3. .Reel 22, Vol. 9, p.840.

4. . Hall to Bomford June 25, 1831, Reel 22, Vol. 1, p.1051. Here Hall describe the transfer as "that part which had been occupied for making bar iron . . out of scraps."

for a shop for grinding barrels, ramrods, and bayonets, and the other portion, for \$ 500, to serve as the stocking shop for his rifles.⁵

Col. Bomford authorized Superintendent George Rust, Jr. to carry out this construction at a cost of \$ 1,500.00 on July 25, 1831.⁶

Prior to this, in January 1831, Hall had also requested and received permission from the Chief of Ordnance to increase the thickness of the flood protection embankment on the southwest side of the rifle factory shops by four feet and also its height by three feet.⁷

The Statement of Sums Expended in making additions and other Permanent Improvements to the Rifle Factory during the Year 1831, reveals that a total of \$ 2,501.27 for spent for the following project⁸

1. For constructing a wall and raising embankment on south side of Rifle Factory to protect it from inundations.....	\$ 252.40½ (9)
2. making repairs and improvements to iron store house , partition, rack, flooring.....	80.00
3. Repairs to Shops No. 2, 3, 4, 7, and 8.....	518.08
4. building kitchens to dwelling houses No. 13 and 14....	433.71½
5. Repairs to dwellings No. 15, 16, and 17.....	76.45
6. erecting charcoal house No. 18.....	107.40

8. Continued- Entry 936-HFNHP Reel 20, Vol. 5, p. 465. The Similar Annual report for the year 1830 fails to include a discussion of the work done at the Rifle Factory during that year.

9. R.G. 217- 1st Series, File 15603- June 8, 1831 and 16094- Voucher 78, December 31, 1831- Michael Cook was paid a total of \$ 12153 in 1831 for making 484 1/3 cubic yards of embankment as an addition to an old embankment @ 25c per yard.

5 . . Ibid.

6 . . Bomford to Rust, July 25, 1831, Reel 14, Vol. 9, p. 824.

7 . . Hall to Bomford, January 7, 1831, Reel 22, v. 11, p. 1018; Bomford to Hall, February 7, 1831, Reel 14, Vol. 9, p. 806.

8. National Accounts and Annual report for 1831, National Archives R.G. 156,

7. erecting furnace and building over it for annealing barrels, No. 19.....	103.24½
8. labor and materials for fitting up (the old) tilt hammer building for a stocking shop, No. 20.....	638.58
9. building a square frame filing shop, No. 21.....	139.40
10. erecting a furnace for hardening rods and building over it. No. 22.....	122.81
11. constructing shed in front of old annealing furnaces, No. 23.	29.19
Total, Construction & Repair, Buildings:	\$ 2,501.27
12. For constructing tools and machinery	8,976.29
With John H. Hall's salary for supervising	367.59
Total, 1831:	\$ 11,845.15

The above reports reveals that the money was spent for the following projects:

Embankment and flood wall.....	\$ 252.40½
Repairs to ten buildings.....	\$ 1,313.11
Additions to two buildings	433.71½
Erecting 5 buildings, including two new furnaces and a shed at old annealing furnaces..	\$ 502.05½
1831 Total:	\$ 2,501.27.

On May 27, 1832, Hall requested permission to construct a one-story filing shop about 17 feet square at an estimated cost of \$ 250.00.

Bomford authorized the construction of this shop on June 25, 1832.

The section of the old tilt hammer shop to be devoted to the grinding of rifle barrels, ramrods, and bayonets was probably altered for that purpose and the structure possibly enlarged in 1832.

- 9... Hall to Bomford, May 27, 1832, Reel 22, Vol. 12, p. 1190.
10... Bomford to Hall, June 25, 1832, Reel 14, Vol. 9, p. 859.

On June 28, 1832, the mason Lewis Wernwag was paid \$ 178.00 for making 114 $2\frac{2}{3}$ perches of stone wall at the Rifle Factory, this may had been a delayed payment for the flood guard wall that he had built in 1831. 11

In September 1832 Hall recommended that a new fire engine be sent to the rifle factory, as the one they had was worn out, and also suggested that a new engine house be erected at a cost of \$ 150 to replace the old structure used for that purpose at the rifle factory. 12 The Watervliet Arsenal at New York sent a new fire engine to Harper's Ferry in October 1832. 13

In the inspection made of the Armory and the Hall Rifle Factory in December 15, 1832, the inspector noted of the Hall works:

Some additional shop room is necessary, for the great quantity of machinery used. The principle shop is now quite too much crowded and additions to the machines are made from time to time, as the ingenious inventor progresses in the fabrication of arms. A few dwelling houses for the workmen at this branch are also much required.. 14

This evidence suggests that two small buildings, a filing shop and a fire engine house, were probably erected for Hall at a cost of approximately \$ 400.00 in 1832. Another \$ 1,500 was probably spent on the grinding mill functions at the old tilt hammer shop.

In the spring of 1833, the slater William Bayley was paid a total of \$ 275.15 for slating 3,580 feet of roof at the Hall Rifle Factory on February 4, 1833. 15

11.R.G. 217-File 16657- June 28, 1832- in this same file there is also a voucher to Michael Cook, May 17, 1832, in the amount of \$ 22.20 "for making 111 cubic yards embankment, Hall's Island". This appear to be a dupictar of F.16094-Voucher / 78, dated Dec. 31, 1831 for the same amount of money and the same amount of embankment.

129. Hall to Bomford, September 22, 1832, Reel 22, V. 13, p.1211. Bomford to Hall, September 24, 1832, Reel 14, Vol. 9, p.871.

13 . Bomford to Supt. Rust, October 27, 1832, Reel 14, Vol. 9, p.875.

14 . Inspection Report, December 15, 1832, National Archives R.G. 156, Special File Box 28, pp.7-8.

15. R.G / 217- File 17644.

Water Power on the Shenandoah River, 1833-34:

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. Col. Bomford authorized Superintendent George Rust, Jr., to build the Shenandoah Dam on August 18, 1831.

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.

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 Shendnaoh River for the use of the U.S. Rifle Factory.

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- 16. Hall to Bomford, July 18, 1831, Reel 22, Vol. 11, p.1055.
 - 17. Bomford to Rust, August 18, 1831, Reel 14, V. 9, p.826.
 - 18. Hall to Bomford, September 5, 1831, Reel 22, V.11, p.1083;
Hall to Bomford, October 25, 1831, Reel 22, V. 11, 1076.
 - 19. Reel 20, Vol. 6, p.580- in National Archives R.G. 156, Entry 129, Vol. I, p. 115: Appropriation in U.S. Statues 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.²⁰ 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 futher 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... 21

20. Deed of B. & 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.

21. 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." 22.

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..." 23

The Armory Accounts show that the sum of \$ 1,999.50 was expended during 1834 in executing and completing this project. 24

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 "brest work" at the dam.

Wernwag did his work and was paid as follows:

August 21, 1834-

For Excavating rock below water and constructing brest work at dam, 133 cubic yards of rock.....	\$ 292.60
For excavating from above water and constructing brest work, 120 cubic yards of rock.....	90.00
Excavating and placing on brestwork 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.yrds.	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

22. Estimates for 1834, Reel 20, Vol. 6, p.583,-National Archives R.G. 156, Entry 129, Vol. I, p. 125. Appropriation in U.S. Statues at Large, IV, p. 675.
23. Estimates for 1834, Reel 20, Vol. 6, p. 585.
24. . 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 ²⁵ cubic yards of rock and 1,962 cubic yards of gravel.

Second Auditor's Summary of Operations of Hall Patent Rifle Plant, 1819 - December 31, 1834.

W.B. Lewis, of the Treasury Department's Second Auditor's Office, in a report dated November 16, 1835, wrote that the total cost of operations at the Rifle Factory from 1819 to December 31, 1834, was \$ 432,899.30. He broke these expenditures down as follows:

For water power and mill dams (1833-34).....	\$ 4,599.50
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For buildings, millwrightwork. (1819-1834).....	31,215.30
---	-----------

For Tools and machinery (1819-34)....	149,410.89
---------------------------------------	------------

For manufacture of rifles and equipments, 1819-34.....	247,673.61
--	------------

Total:	\$ 432,899.30	26
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During this period, 1819-34, a total of 11,000 Hall rifles had been produced.

25. R.G. 217-1st Series, File 19021-Abstract F, 3rd Quarter of 1834.

26. Serial No. 287, Document 44, p.366/

1836.]

ORDNANCE AND ORDNANCE STORES.

(27)

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Statement of the expenditures at the rifle factory, Harper's Ferry armory, since its establishment, to December 31, 1834.

Year.	For water power and mill dams.	Buildings, mill-wright work.	Tools and machinery.	Manufacture of rifle and equipments.	Amount expended in each year.
1819 to 1821, inclusive		\$4,130 14	\$11,917 03	\$10,544 62	\$26,591 79
1822.....		47 33	5,028 95	1,319 95	6,456 29
1823.....		42 44	5,938 48	3,768 68	9,749 60
1824.....		1,557 01	12,216 04	6,922 72	20,695 77
1825.....		1,076 72	14,448 72	4,709 81	20,235 25
1826.....		236 18	8,002 06	4,647 68	12,885 92
1827.....		5,952 93	15,879 10	18,911 40	40,743 43
1828.....		5,665 23	17,779 77	26,322 91	49,768 61
1829.....		3,425 96	19,334 43	17,351 25	40,162 94
1830.....		887 45	10,671 85	20,958 15	32,517 45
1831.....		2,491 27	9,355 78	27,016 23	38,863 28
1832.....		3,837 40	12,100 76	25,060 51	50,998 67
1833.....	\$2,600 00	968 62	1,833 60	35,533 53	41,045 75
1834.....	1,999 50	295 87	4,744 32	34,545 56	42,185 25
Total	4,599 50	31,215 30	149,410 29	247,673 61	432,899 30

NOTE.—No separate accounts having been kept of the yearly expenditures at the rifle factory in 1819, 1820, and 1821, it is now impracticable to furnish the annual expense for those years as required by the resolution.

W. E. LEWIS.

TREASURY DEPARTMENT, Second Auditor's Office, November 16, 1835.

(27). American State Papers, Military Affairs, V, p.915.

Buildings on the Lower Hall Island, October 1834, as shown on Maps No. 4 and 5, with tentative identification of some Structures:

Documentary evidence indicates that the following work shops were standing at John H. Hall's Plant Rifle Factory in 1834:

1. Hall's Machine Shop, a one-story frame structure, 50 by 16 feet in size, altered at a cost of \$ 600.00 from a saw mill into Hall's principal machine and water shop in 1819. Had one water wheel, 12 feet in diameter and wooden. In 1825 this shop was extensively enlarged and a second wooden water wheel, 10 feet in diameter, was installed in the new wing. Hall's Machine Shop may be Bldg. No. 17 on Maps No. 4 and 5. Cost of 1824-25 addition about \$ 1,700.00.
2. Hall's Smith or Forging Shop. This two-story stone blacksmith's shop, 30 feet square, was built for John H. Hall's use at a cost of approximately \$ 800.00 in 1819. Hall's 1819 Smiths Shop is Bldg. No. 21 on Maps No. 4 and 5. Bldg. No. 22 Map. No.6(1848).
3. Small Kilm for Steaming Rifle Stocks, erected in 1825. See 'Bldg. 15 on Map No. 6 (1848). p.
4. Small Brick workshop erected in 1825.
5. Brick annealing furnace erected in 1825.--In 1831 a shed was erected in front of "the old annealing
6. Brick annealing furnace erected in 1825.--furnaces" at cost of \$ 29.19. These are perhaps buildings No. 19 and 20 on Maps No. 4 and 5.
7. Grinding Mill, A one-story brick building 85 by 40 feet in size, erect in 1808-09. This water shop, which had one water wheel, was valued at \$ 6,000 in 1821. The shop was turned over to John H. Hall for his use in 1827. A large new stone wing with a water wheel was added at a cost of \$ 1,500 to the original structure in 1827. The Grinding Shop, probably the "Bell Shop, with a cupola or belfry that was added to the roof in 1828, may be Bldg. No. 16 on Maps No. 4 and 5. The wooden water wheel in the stone wing had a 10 foot diameter. This is bldg. No. 13 on Map No. 6 (1848). p.
8. Smiths Shop. A one-story stone building 35 feet square, with four forges and four chimneys, slate roof. This building, erected in 1827 at a cost of approximately \$ 1,400.00, is Bldg. No. 22 on Maps No. 4 and 5. Bldg. No. 19, Map 6 (1848), p.
9. Store House for Coal, A stone building erected in 1827 at a cost of approximately \$ 700.00. Probably Bldg, 18, Maps No. 4 and 5.
10. Tilt Hammer Shop, stone, one-story, 45 by 45 feet, probably built in 1828. This may be Bldg. 5 on the Maps No. 4 and 5. If so the structure had been considerably enlarged since 1828. This shop had a water wheel. Bldg. No. 5 is identified by a 1834 legend on Map No. 5 as the "Trip Hammer Shop."

11. Coal House, stone, erected in 1822 at a cost of \$ 200.00 for the use of the Armory. Probably turned over to Hall in 1834. Bldg. 9 on Maps 4 and 5, because of its location near the two smiths shops, may be the coal house.
12. Store House for Iron, stone, erected 1824 at a cost of \$ 500.00 for use of the Armory. In 1834 the Armory erected a large store house for iron and a coal bin at the U.S. Musket Factory. The Hall Island store house for iron was probably turned over to Hall for his use in 1834. Grinding and Perhaps Bldg. No. 8 on Maps. 4 and 5.
13. Hall's Stocking Shop: Erected as a tilt hammer shop in 1808-09. The one story brick building was 45 feet square and valued at \$ 4,000.00 in 1821. The shop had a water wheel, which in 1830, drove two tilt hammers and a forge hammer for Armory purposes. In June 1831 this old shop was turned over to Hall for his use. One section was converted into a shop for grinding barrels, bayonets, and ramrods for his rifles at a cost of approximately \$ 1,500.00 and the other section of the building was altered at a cost of \$ 638.58, in 1831 for use as stocking shop. The alteration to the grinding functions was probably done in 1832. and the building may have been enlarged at that time. Hall's Grinding Mill and Stocking Shop is probably Bldg. No. 7 on Maps No. 4 and 5.
14. Building and furnace for annealing Barrels, erected in 1831 at cost of \$ 103.24½.
15. Charcoal House, erected in 1831 at cost of \$ 107.40, probably frame structure.
16. Building and Furnace for hardening rods, erected in 1831 at a cost of \$ 122.81. For ramrods.
17. Filing Shop: A frame square structure erected in 1831 at a cost of \$ 139.40.
18. Filing Shop: One-story building about 17 feet square erected in 1832 at and approximate cost of \$ 250.00.
19. Fire Engine House: A frame fire engine house was probably erected in 1832 at a cost of \$ 150.00 to replace the old engine house.
20. Captain John H. Hall's Office. Date of construction of his office is not known, but after 1819 and probably after 1827. The original 1834 legend on Map No. 4 identifies Bldg. No. 15 on Maps No. 4 and 5 as "Capt. Hall's Office."

This leaves three structures unidentified as to date of construction and function out of the total of 22 buildings shown on the 1834 maps.

MAP NO. 4

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 Kesrney, 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.

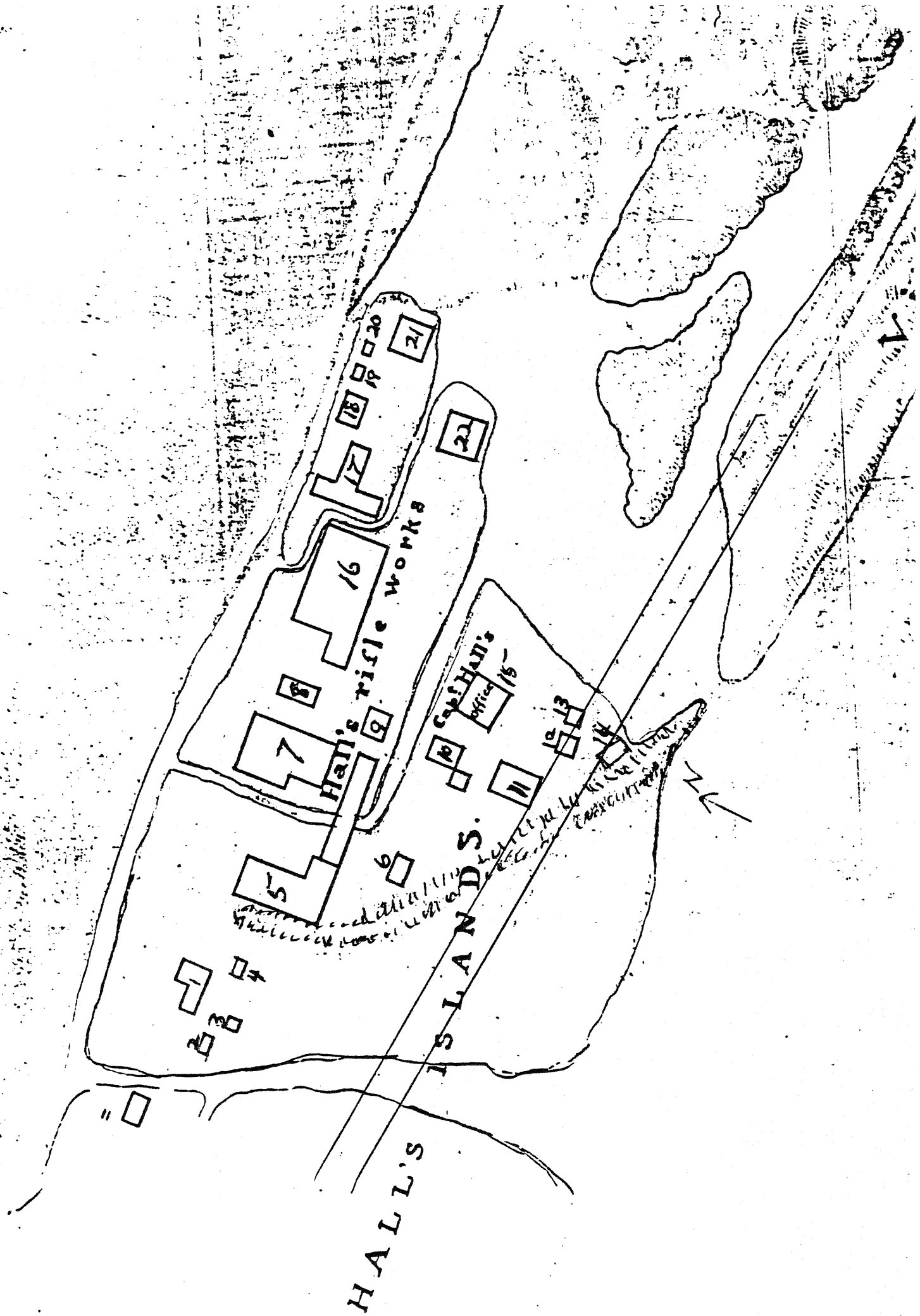
This map shows conditions at the John H. Hall Rifle Factory as of October 1834.

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.



"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".

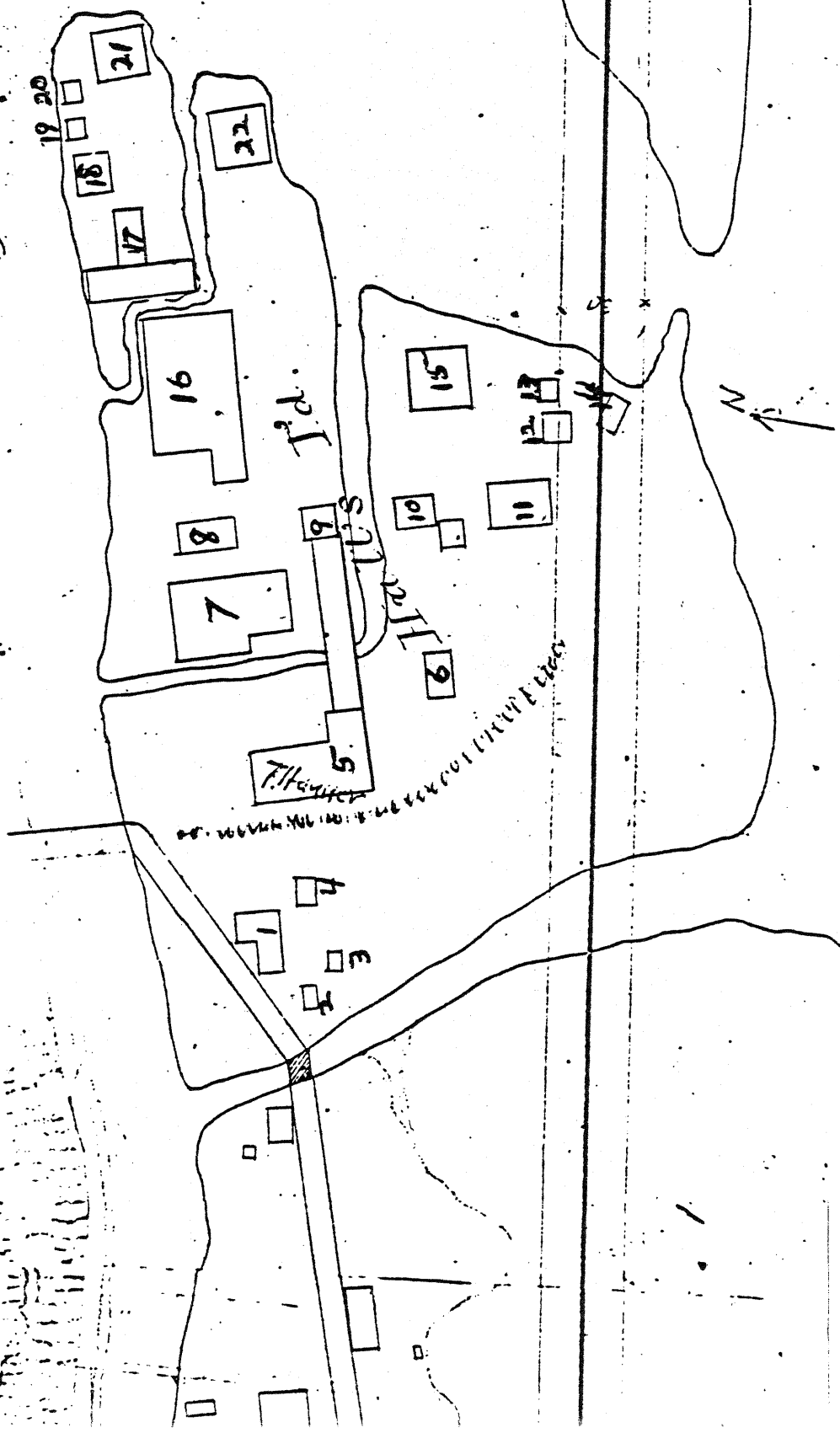
Tentative Identification of Rifle Factory Shops

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- No. 2. 15 by 10 feet.
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- 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.
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- No. 8. 32 by 15 feet. Perhaps the 1824 Iron House.
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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)

Galley Works



S h e n a n d o a h

' & Photo

With the construction of the Store House for iron and a coal bin completed at the U.S. Musket Factory by the end of 1834, the Armory probably then turned its similiar facilities, the 1822 Coal House, and 1824 Store House for Iron on the Hall Islands over to John H. Hall for his use. The transferr of these two store houses in late 1834 would have ended all Armory operations or use of buildings at the Rifle Factory.

Construction at the Rifle Factory in 1835:

On March 9, 1835, Superintendent George Rust, Jr. informed Col. Bomford that two annealing houses, to be built of brick or stone at an estimated cost of \$ 2,000.00 were much needed at the Rifle Factory and requested permission to erect these structures. This construction was authorized and on April 15, 1835, Benjamin Moor, acting superintendent entered into a contract with Joseph Mullen, bricklayer, to construct the two brick annealing houses at the Rifle Factory. Mullen was to provide all of the materials and labor necessary to erect the structures. He was to be paid at the following rates:

For Brick work per every thousand of brick, nine dollars, & for the stone work - \$ 1.50 per perch. For the brick cornice per foot twelve and a half cents. Single arches per each Fifty cents - double arches for each one dollar and seventy five cents." 29

28. Rust to Bomford, March 9, 1835, Reel 12, vol. 1, p. 11.

29. National Archives R.G. 156. Contract Book No. 13, p.231. in HFNHP Photostat Collections, Vol. 1, p.39.

Joseph Mullen apparently dug the foundations and laid the stone foundations of the first of the two proposed brick annealing structures in May or June 1835. The Paymaster vouchers for the 2nd quarter of 1835 are missing so that the details of Mullen work can not be established.

By late June and early July, however, he had completed the brick work on July 8, 1834 of the first structure and received \$ 257.48 for the following services:

for furnishing and laying 26,978 bricks.....	\$ 242.80
for making four brick arches of 14 inches.....	7.00
for making 2 brick arches of 7 inches	1.00
for laying 53½ feet of cornice.....	6.68
Received for "Annealing furnace at Rifle Factory":	\$257. 48 30

The records for the carpenter work on this first structure are missing.

On August 13, 1835, however, Jeremiah Harris was paid \$ 26.75 "for plastering 214 square yards on the new annealing shop at the rifle factory." 31

Also in August 1835, the slater William Bayley received \$ 122.27 for slating 1,143 feet of slating on roof of new annealing house" at the rifle factory. 32 The Annealing Shop was thus finished by the middle of August and its recorded cost, exclusive of the stone foundation and carpenter work, was \$ 409.85.

The records for the construction of the Annealing Furnace No. 2 are complete, and reveal that Joseph Mullen, the mason, must have begun construction on Bldg. No. 2 in July and had completed his work under his contract by September 30, 1835. At the latter date he received \$ 170.28 for substituting a brick building for the wood shed now

30. R.G. 217-1st Series- File 20041-Voucher 27A.

31. R.G 217- 20041- V. 36A.

32. R.G. - 20041- V. 45A.

"the barrel annealing furnace at the rifle factory." His services included

for 4 3/4 days digging foundation, finishing stone and laying	
21 perches of wall(in the foundation).....	\$ 31.50.
for furnishing and laying 14,235 brick.....	128.11
for laying 37 feet brick cornice.....	4.62
for making a large arch.....	2.50
Other.....	
Total, Sept.30,1835	\$ 171.35 33

The number of brick laid indicates that Shop No. 1 was almost twice as large as shop No. 2. Structure No. 2 was probably the Annealing Furnace(see below)

The carpenter Daniel T. Mathias received a total of \$ 72.12 for his carpenter work on the second shop, which included:

Sept. 17,1835- for making 6 door frames, 6 batten double doors	
and 988 feet of rafter.....	\$ 60.37 (34)
Nov. 13,1835- for 324 feet of framing roof,annealing house.....	11.75 (35)
Carpenter Work, 1835:	\$ 72.12

Jerry(or Jeremiah) Harris was paid \$ 13.50 "for plastering 208 square yards on new annealing house at the rifle factory" on October 22,1835.

Shop No. 2 was apparently completed in October for on the 24th of that month William Bayley received \$ 43.46 "for slating 444 feet of roof of annealing shop at the rifle factory." The total cost of erecting annealing shop No. 2 appear to have been \$ 299.36, exclusive of costs of building the furnace

Recorded cost of erecting the two annealing houses in 1835 exceeded \$ 709.21, exclusive-apparently of building their furnaces. The total estimates costs of the two structures and furnances had been \$ 2,000.00. These two annealing structures are probably Bldgs. No. 20 and 21 on Map No. 6 (1848). Shop No.1 being Bldg. No. 20- the Annealing shop, and Shop 2 being No. 21-the Annealing Furnace.

- 33.R.G. 217- 20041.
- 34. R. G. 217- 20041-57A.
- 35. R.G. 217- .20281-22A.
- 36. R.G. 217- 20281-9A.
- 37. R.G. 217- 20281- 13A.

The two brick annealing buildings erected in 1835 replaced two older buildings that were demolished. The number of structures on Hall's Rifle Factory Island therefore remained in 1835 at 22, as it had in 1834.

The approximate expenditures for repairs and improvements at the Hall Rifle Factory during the years 1830 to 1835 is shown on the chart that follows.

Expenditures, Repairs and Improvements at
Hall's U.S. Rifle Factory, Harper's Ferry Virginia

Year	New Workshops		Repair Workshops		Additions		Dwellings		Repairs		Dams & Canals	Walls, Flood	Total
	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost			
1830	0	0	1										\$ 887.45
1831+	4	472.85	8	1,265.85	2	433.71½	3	76.45				252.40½	2,501.27(1)
1832	2	400.00	1	1,500.00 (4)									3,837.40
1833*				\$ 275.15(3)									968.62(2)
1834											1,999.50		2,895.37
1835	2	2,000.00		(5)	6.25						(6) 207.18		5,788.03
Total:	8	\$ 2,872.85	10	\$ 3,047.25	2	\$ 433.71½	3	76.45			\$ 2,206.68	\$ 252.40½	\$ 16,878.14

+ from Annual Report for 1831, National Archives Record Group 156, Entry 936, HFNHP Reel 20, Vol. 6, p.465.
The similar statement for 1830 does not contain a statement on the Rifle Factory program that year.

- (1) or \$ 2,491.27 from Second Auditors report, Nov. 16, 1835.
- (2) not including \$ 2,600.00 spent to purchase water rights on the Shenandoah.
- (3) For slating 3,580 feet of roofs, Hall's workshops.
- (4) estimated cost of altering a section of old tilt hammer shop for use as grinding mill for barrels, bayonets and ramrods. Large addition probably made to original structure.
- (5) R.G. 217-1st series- 20041- Sept. 14, 1835- to Jeremiah Harris, \$ 6.25 for 50 yards of plastering at the Rifle Factory.
- (6) R.G. 217 -20041-3rd Quarter of 1835 for "new canal" at rifle factory.

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 (38)

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.

No other work were done on the Shenandoah Canal and Dam in 1835/.

A Right of Way Across the Hall Islands for the Winchester and Potomac Railroad, 1834-35.

On April 14, 1834, the President and Chief Engineer of the Winchester and Potomac Railroad Company, which had been organized in 1831, wrote to the Secretary of War and requested that their company be granted a right of way across U.S. Armory land at Harpers Ferry so that the tracks of the railroad could reach the junction of the Potomac and Shenandoah Rivers in that town.¹ Congress passed a joint resolution in April 1834 directing that the railroad be granted such a right of way.² In response to this order, the U.S. Army Topographical Engineers spent the summer of 1834 at Harpers Ferry preparing maps of the U.S. Armory buildings at the Musket Factory, Arsenal Square, and the Upper and Lower Hall Islands so that the grant could be made with as little damage as was possible to Armory property and operations.

Their work resulted, in part, in the preparations of Maps No. 4 and 5 in this study. The Engineers final report was completed October 7, 1834 and transmitted to the Secretary of War on October 23. Andrew Jackson, President of the United States, approved a right of way, as had been recommended by the Army engineers, on January 27, 1835.³

Under the right of right granted, the railroad line left the mainland near the the western(upper) end of Strider's island and by a 30 foot wide right of way traversed Strider's, Throps, the U.S. Upper Hall, the U.S. Lower Hall, and Virginius Islands, returning to the main land on the narraow plains of Harpers Ferry, about 43 yards west(or above) of a foot-bridge at the lower or eastern end of Virginus Island. The railroad line was constructed in 1835 and began operations in 1836.

1. Serial No. 262, Document No. 432, pp.1-3.

2. Serial No. 262, Doc. 432, p.1.

3. Serial No. 271, Document No.2, pp.184-187, published complete report of engineers and related correspondence.

Construction and Repair at the U.S. Rifle Factory, 1836-41:

During the years 1836 to 1841, John H. Hall's Rifle Factory on the Shenandoah became a part of the regular Harper's Ferry Armory operations. The Special estimates for repairs and improvements for the Musket Factory also, for the first time, included requests for funds for similiar projects at the Rifle Factory. Congress thus appropriated a total \$ 24,193.00 for repairs and improvements at Hall's Factory during 1836-41 as follows: \$ 1,024.00 to erect a workshop in 1836; \$ 8,569.00 to build four work shops and to enlarge the flood

protection wall in 1837, and \$ 14,600.00 for general repairs¹ and improvements at the Rifle Factory in 1840. During these years five of small frame makeshift shops of Hall were replaced by new structures built of stone and brick.

1. The Drilling Shop, 1836:

Superintendent George Rust, Jr. and Captain John H. Hall, in their draft of requests for appropriations in 1836 requested the sum of \$ 1,024.00 to "erect a Drilling Shop at the Rifle Factory." Lt. Col. George Talcott, Inspector of Armories and Arsenal, reviewed and endorsed this project on July 25, 1835, writing: "This Building is absolutely indispensable for the security of that part of the Establishment² and the estimate is low."

1. Appropriations in U.S. Statues at Large, Vol. 5, 77(1836); V, p. 149(1837); and Vol. V, p. 406 (1840).
2. Inspection Report, July 25, 1835, HFNHP Photostat Collection, Vol. 1, pp. 45 and 48.

The special estimate for additional funds for the Harper's Ferry Armory, which requested a total \$ 77,897.00 for 1836, thus included an item in the amount of \$ 1,024.00 " for the erection of a drill shop at the rifle works, 50 feet long, 17½ feet wide, one story high, of brick with slated roof..."³

Chief of Ordnance, Col. George Bomford explained the need for this proposed shop to Congress as follows:

L. The erection of a suitable building for a drill shop at the rifle factory at this armory, is considered indispensable; that at present used for this purpose being an old wooden building very like to take fire, and from its position, to endanger other shops and machinery. The sum of \$ 1,024 has therefore been inserted in this estimate for building a new drill shop.⁴

Lt.Col. Talcott made another partial inspection of the Harper's Ferry Armory during the period June 21 to June 25, 1836, and reported to Col. George Bomford, Chief of Ordnance, "That part of the Armory devoted to the manufacture of Hall rifles was examined and instructions given verbally concerning the construction of the drill shop, in case the money should be appropriated by Congress."⁵

The act appropriating the requested \$ 77,897.00, including the money for the Drill Shop, was approved⁶ by the President on July 2, 1836. Construction on the building got underway in October 1836.

3. Special Estimate for additional appropriations for the service of the Ordnance Department for the year 1836, dated January 11, 1836, in Serial No. 288, Document 90, p. 10.

4. Ibid., Serial No. 288, Document 90, p. 10.

5. Inspection of Harper's Ferry Armory on the 21st to the 25th June 1836, in HFNHP Photostat Collection, Vol. 1, p. 56.

6. U.S. Statues at Large, V, p. 77.

Writing from the Armory on November 3, 1836, Lt. Col. Talcott informed Col. Bomford : "The Drill shop at the Rifle works, for which an appropriation was made by Congress, is nearly finished. No other structures (at the musket Factory) has been commenced, nor has there been expended any part of the large sum specially appropriated this year for the Armory. The lateness of the season when the appropriations were available (joined to the scarcity of building materials) has been mentioned as a reason why nothing was done (Superintendent George Rust, Jr.'s extended absences from the Armory was probably another reason)... The whole sum can be judiciously expended in 1837 and perhaps [with more economy than at present..."

The vouchers of the Paymaster of the National Armory reveal that the Drill Shop cost \$ 1,021.53 to construct in 1836-37 and that it was erected by the following artisans: stone and brick masonry work by Joseph Spencer, carpenter work by James Foley, plastering by Jerry Harris, and the slating by William Bayley. (See Data, page 67). **

The Drill Shop
is Building No. 18 on the 1848 Map of the Rifle Factory (Map No. 6).

The Construction Program for 1837:

On June 18, 1836, Captain John H. Hall wrote to Col. Bomford regarding the danger that the recent great flood on the Shenandoah had posed to the Rifle Factory plant, reporting:

7. Talcott's Inspection of Harper's Ferry Armory, Report, November 3, 1836, in HFNHP Photostat Collection, Vol. 1, p. 63

** The new drill shop probably replaced Hall's one-story wooden machine shop which measured 50 by 16 feet in 1819. See Bldg. 17 and Maps 9 and 10 (1834), pp. 298-299 for 1819 machine shop.

Construction of Drill Shop, 1836-37

Bldg. 18 on Map No. 6 (1848)
Rifle Factory

Record File No.	Group Voucher No.	Artisan	Date	Amount	Remarks
761		Joseph Spencer	10/12/36	\$108.50	Mason work, for furnishing and laying in mortar 62 perches of stone, foundation new building to replace old drill shop.
761		Joseph Spencer	11/12/36	33.25	For 19 perches of stone.
761	113B	Joseph Spencer	12/36	262.79	For furnishing and laying in mortar 25,311 brick; making 2 arches for door; making 12 arches for windows, laying 109½ ft of cornice, Drill Shop.
761		Joseph Spencer	10/12/36	\$ 404.54	Mason Work
761	112B	James Foley	12.36	\$ 66.87	Carpenter work of self, 18½ days, of journeyman-27½ days. making 2 window frames and 18 lintels.
761		James Foley	12/36	\$ 54.05	Carpenter work
Subtotal		James Foley	12/36	\$ 120.92	Carpenter Work
761		Jerry Harris	12/31/36	\$ 12.34	For plastering one coat 154½ square yards plaster at new drill shop.
Total Value		of Work in 3rd and 4th quarter of 1836 on shop was		\$854.03	Serial No. 304, Doc. 186, p.3.
951	D 108	William Bayley	1837 1st qr.	\$ 167.56	For slating roof of new drill shop, 16 3/4 squares of slate.
Total Cost		of Drill Shop *	1836-37	\$ 1,021.59	Appropriation (1836) was \$ 1,024.00.

* 2364 - No. 122C - Abstract C for 2nd quarter of 1838 - an Additional \$ 2.80 for carpenter work by James Foley is charged against the Browning shop account.

In the late freshet here the embankment above the rifle works, by which that portion of the public property is protected from inundations and probable destruction, presented indications of great danger - The water penetrated through its sides, in several places, near the base - threatening to undermine and destroy it - although of more than twenty feet thickness.

This freshet, it is said, was not so high as one that occurred in 1810, by more than four feet - A height that would, apparently, have caused the destruction of the embankment and a great amount of valuable public property. It is Believed that the water penetrated the bank thro' holes made by muskrats, which are very destructive to walls of earth near water courses.

The best protection, in this case is to be obtained from a strong wall of stone parallel to the present embankment - a few feet from it, and extending down to solid rock below, which is within about two feet of the surface - The wall to be of such thickness and strength as to resist the force of the highest freshets - such a wall would require to be about six feet in thickness, twelve feet in height and two hundred and fifty feet in length - containing 720 perches, it would cost now \$ 1,70 per perch or \$ 1,224 and for excavating & removing the earth for the foundation about fifty dollars.

It is believed that it would be proper and necessary to fill in between it and the present embankment, with earth, which for about fifteen hundred cubic yards would be required,

This quantity at 40 cents per yard, the present price, would amount to \$ 600 - making a total of eighteen hundred and seventy-four

dollars.

Although it is now twenty-six years since the highest freshet remembered occurred here, yet such an one may again occur soon, and it would be inexcusable in me to neglect to apprise the Government of its great danger - and that a preventive ought to be applied without delay.

Recapitulation:	Stone wall	\$ 1,224	
	Excavating for it	50	
	Filling in between		
	in & the bank	600	
	total:	\$ 1,874	8

During his inspection of the Rifle Factory in October 1836, Lt. Col. George Talcott endorsed the proposed river wall project and also recommended that several new workshops should be put up at the rifle factory, writing to Col. Bomford:

"Several additions to the shop room at the Rifle factory appear to be indispensable and an estimate of their cost is presented herewith. The river wall is very desirable and will add to the security of the whole establishment in times of high freshets. Everything under the supervision of Capt. Hall appears to be well managed and a due regard to economy is manifested...."

As a result of Hall's and Talcott's actions the Special Estimates for the service of the Ordnance Department for the year 1837 asked Congress to provide \$ 8,569 to construct the river wall and also four new workshops at the Rifle Factory. As has been mentioned,

Congress appropriated the requested \$ 8,569 on March 1, 1837¹¹ and on the 10th of that month, Col. Bomford informed Superintendent Rust that these funds were available and construction could begin.¹²

9. . Inspection of Halls Rifle Factory at the Harpers Ferry Armory, October 31, 1836 report, HFNHP PhotoStat Collection, Vol. L, p. 60. .

10. American State Papers- Military Affairs, VI, p.977, p.980.-
"Special estimate for additional appropriations for the service of the Ordnance Department for the year 1837." dated January 21, 1837.

11. U.S. Statues at Large, V, p. 149.

12. Bomford to Rust, March 10, 1837, Reel 14, Vol. 11, pp. 1091-1092.

General Rust, however, resigned by the end of March and his replacement, Col. Edward Lucas, Jr., did not take office until April. This change in superintendents delayed the start of construction in 1837 at the U.S. Musket Factory, but apparently did not at the Hall Rifle Factory. Lt. Col. George Talcott, inspecting the Harper's Ferry Armory from June 16 to June 25, 1837, reported in part:

"Improvements at Hall Rifle Factory authorized by appropriation:

1. Drill Shop - Finished in 1836.
2. (River) Guard Wall & embankment- finished (in 1837).
3. Browning Shop (\$ 1,114 brick structure)-finished (in 1837).
4. Tilt Hammer Shop- just commenced.
5. Workshop for jobbers(filing) finished (in 1837).
6. Workshop for Springmakers, etc.- foundations laid."

13

By the 31st of December 1837, \$ 7,349.48 of the \$ 8,569.00 had been spent.
Building the River Wall, 1837:

The \$ 1,874.00 provided in 1837 was to be used to erect "a stone wall 250 feet long, 12 feet high, and 6 feet thick, for the protection of the rifle works." (Maps No 4 and 5 , both drawn 1834)(pp. 55 and 56) show where the old flood wall and embankment were located on the west and south sides of the rifle factory.)

The stone wall and ~~earth embankment~~ was erected by Lewis Wernwag and ¹⁴ Anthony Storm in May and June of 1837 at a cost of \$ 1,535.22. Wernwag constructed 309 perches of stone wall in mortar and 195 cubic yards of earth embankment. Storm built 2,037½ cubic yard of earth embankments on the guard wall project. (See Page 71)

13. Inspection of Harper's Ferry Armory, 16th to 25th June 1837=Report,
HFNHP Photostat Collection, Vol. 1, pp.73-74.

14. Record Group 217- File 1423.

Construction of River Guard Wall, 1837

Hall Rifle Factory

Record Group 217		Artisan	Date	Amount	Remarks	
File No.	Voucher No.					
1423	140A	John Wernwag	6/37	\$ 116.22	For excavation of tail race, 37 7/27 cubic yards, \$9.31; for excavation for embankment, 195 cubic yards, \$ 48.75	58.16
1423	189	John Wernwag	5/15/37	\$ 226.00	For mason work, furnishing material and laying in mortar 113 perches of stone wall for protection of rifle factory.	
1423	189	John Wernwag	6/2/37	\$ 378.00	For mason work, furnishing and laying 189 perches of stone in guard wall.	
Subtotal		John Wernwag	May-June	\$ 720.22	302 perches of stone wall; 195 cubic yds, embankment	
1423	186	Anthony Storm	5/4/37	\$ 340.00	For hauling and filling in 850 cubic yds, of earth at protection wall at rifle factory.	
1423	188	Anthony Storm	5/23/37	\$ 200.00	For 500 cubic yds of earth hauled and filled.	
1423	203	Anthony Storm	6/30/37	\$ 275.00	For hauling and filling 687½ cubic yds of earth for embankment.	
Subtotal		Anthony Storm	May-June	\$ 815.00	for 2,037½ cubic yards of earth embankment at 40c per yard.	
Total:			1837	\$ 1,535.22	For 302 perches of stone wall and 2,232½ cubic yards of earth embankment.	

MAP NO. 6

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 Virginus. 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:

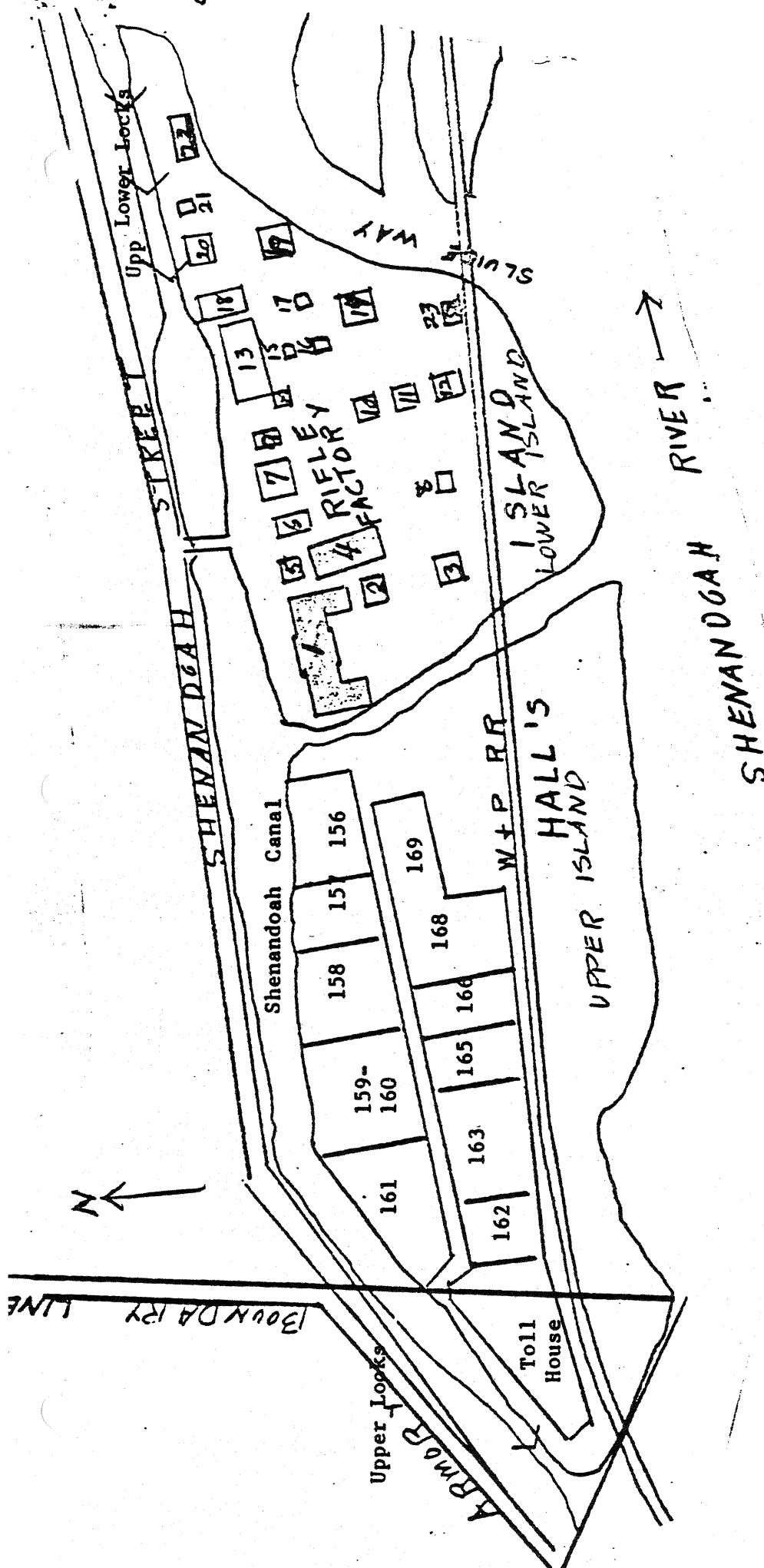
Structures not marked "new" by Brown may appear on Maps 4 and 5, both made in 1834, and hence are useful in identifying the unmarked shops on the two earlier maps.

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(1831)
7. Tilt Hammer Shop.(1837-38)
8. Vitriol House.(1837)
9. Rod Tilting Shop(1831).
10. Inspectors Office.
11. Asembling and Finishing Shop.(1837).
12. Barrel Turning and Boring Shop.
13. Bell Shop, Stockers and Machinery.(1808-09.)
14. Store House and Office.
15. House for Steaming Stocks.
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).



3. The Browning or Vitriol Shop, 1837:

On April 2, 1836, Superintendent George Rust, Jr. informed Col. George Bomford:

Captain Hall has asked permission to erect a Browning house at the Rifle **Factory**. The cost of which he represents will not exceed \$200. He has for some time made use of the old office in front of the Superintendent's Quarters (which were located in the U.S. Musket Factory yard on the Potomac) which being in a ruinous and dilapidated condition will be shortly taken down." Rust recommended that permission be granted to erect the new shop.¹⁵ Col. Bomford, on April 12, 1836, authorized Rust to erect the Browning Shop, "provided that the cost did not exceed the estimate of \$ 200."¹⁶

The building, however, was probably not constructed because (1) the vouchers of the Paymaster of the Armory, for the year 1836 do not include payments for construction of such a structure; and (2), the the Special estimate for additional funds for the year 1837 included a request of \$ 1,114.00 " for building a shop for browning gun barrels, of brick, 20 feet by 22 feet, two stories high."¹⁷ As has been noted, Congress appropriated the requested amount for this shop on March 1, 1837.

Construction on the Browning Shop was underway in April and the building was completed by the end of June at a cost of about \$ 724.07 (see Chart p.74), work on other buildings at the Rifle Factory, charged against this shop, brought the official cost of the Browning shop to \$ 1,118.91 in 1837. The excavation for the basement and the 75 perches of stone mortar wall laid for the foundation of the shop was done by John McClure.

15. Reel 12, Vol. 2, pp.187-188.

16. Bomford to Rust, April 12, 1836, Reel 14, Vol. 11, p.1045.

17. ASP-MA, VI, p.977.

Construction of Browning Shop, 1837

Rifle Factory

Record Group 217: File No. Voucher		Artisan		Date	Amount	Remarks
No.						
1423	184	John McClure		4/27/37	\$ 170.41	For excavating 81 2/3 cu. yds of earth= \$ 20.41; furnishing materials and laying 75 perches in mortar of stone wall, foundation for Browning Shop.
1423	40A	Joseph Spencer		5/4/37	\$ 69.05	for 20 days laying stone wall=\$ 25.40; furnishing and laying in mortar 3,600 brick=\$ 32.40
1423	185	Joseph Spencer		6/37	\$ 269.98	for laying 27,504 brick at browning shop=\$275.04; laying 44 feet of cornice, \$ 7.33; laying 1 arch of 14 inches=\$1.00, laying 10 arches of 10 inches, \$ 5.00+ \$ 2.25, total \$ 290.62-minus \$ 21.64 deducted.
Subtotal		Joseph Spencer		April-June	\$ 339.03	Laying 31,104 brick &c
1423	182	James Foley		6/37	\$ 87.60	For carpenter work at browning shop: making 200 lights of sash, \$20.00; making 10 window frames, \$12.50; laying 1,388 feet of floors (2 stories), \$17.38; making one eight-panel door.
1423	183	Sidney L. Gallaher		6/21/37	\$ 8.62	for plastering 138 square yds at Browning Shop.
1423	181	William Bayley		6/2/37	\$ 103.00	for slating roof of the Browning Shop. 7 and 26/100 squares of slate roofing.
1716	34A	Benjamin Snook		8/37	\$ 25.62	making browning kettle for Browning shop.
1716	118C	John P. Kennedy		8/21/37	(\$ 15.42)	\$ 30.83 for painting the Browning and Jobbing Shops for Smiths at the Rifle Factory.
2092	Abstract C			12/37	\$ 410.25	In Dec. 1837 the sum of \$410.25 was charged against the Browning Shop, probably for work on other shops. Amount spent to purchase materials for use in Brown Shop was \$ 254.04
Total:				1837	\$ 1,118.91	Not including kettle or painting charges,

The 31,104 brick laid in the walls of the two-story, 20 by 22 foot, edifice were laid by the mason Joseph Spencer, who had also done the brick work on the Drill Shop at the Rifle Factory in 1836. The carpenter work was executed by James Foley, who had done similar work in the drill shop in the preceeding year. Sidney L. Gallaher did the plastering, William Bayley the slating, and John P. Kennedy the painting on the Browning Shop.

The vouchers paying for construction indicate that the Browning Shop had 10 windows and one door. The door, located on the first story, had eight panels. The Browning Shop is Bldg. No. 8 on Map No. 6, p. 74.

During the 3rd quarter of 1837 1,285 feet 3 ¹⁸ inches of "spouting" were purchased from the tinsmith Benjamin Snook for \$ 220.95- some or all roofs of the of this may have been used on the/new shops going up at the Rifle Factory.

4. Work or Jobbing Shop for Filers, 1837:

The appropriations of March 1, 1837 also provided the sum of \$ 1,538.00 "for erecting a workshop for jobbers of brick, 25 feet long, 22 feet wide, and 20 feet ¹⁹ (two stories) high." Construction on this shop got underway in May and the building appears to have been completed in August 1837 at a cost of approximately \$ 1,115.73. (See Chart p. 76.)

Additional work and perhaps charges for construction on other shops, but paid from the Jobbing Shop funds, brought the total costs to about \$ 1,350.00. The foundations of stone were built by John Cliver; Joseph Spencer did the brick work, laying 43,980 in the 20 foot high structure. James Foley did the carpenter work and William Bayley slated the roof.

The shop appears to have had 20 windows and two exterior doors. The latter were of the eight panel type. This is Bldg. No. 5 on Map 6, (1848), p. 72.

18.R.G. 217- 1716- 34A, To Benjmain Snook, August 1837.

19. Description from Special estimates for 1837, in ASP-MA, VI, p. 977.

1837

Construction of Jobbing Shop For Filers

Rifle Factory

Record Group 217: File No. Voucher		Artisan	Date	Amount	Remarks
No.					
1423	176	John Cliver	6/5/37	\$ 242.43	For 71 3/9 cubic yards of excavation-\$ 17.63; for laying in mortar 112 perches of wall=\$ 224.80-foundation of Jobbing Shop-filers.
1423	185	Joseph Spencer	6/37	\$ 461.63	for furnishing and laying 43,980 brick at jobbing shop for filers=\$439.80 laying 50 feet of cornice, \$ 8.33; laying 7 14 inch arches=\$ 7.00; laying 13 9 inch arches=\$ 6.50.
1423	177	James Foley	6/17/37	\$ 93.62	Carpenter work on jobbing shop, filers, making 25 window frames, 2 door frames, 2 doors with 8 panels, and 420 lights of sash.
Subtotal				\$ 797.68	
1716	118C	John McElwee	8/37	\$ 11.58	Mason work, 3 1/2 perches of stone wall built, Jobbing shop for filers.
1716	118C	John P. Kennedy	8/21/37	(\$ 15.51)	\$ 30.93 for painting at the Browning Shop and Jobbing Shop for Filers
1716	C	James Foley	9/10/37	\$ 85.49	Carpenter work, making 18 window sills, 2 door sills, and 2,400 feet of rough flooring for jobbing shop, filers.
1716		William Bayley	8/25/37	\$ 190.50	for slating 19 1/2 squares roof, jobbing shop for filers.
Subtotal		3rd quarter		318.05 *	
2092	Charges June 30-Dec. 31, 1837			\$ 266.73	Charges for materials issued during last six months.
2094	140A	James Foley	12/30/37	\$ 22.50	for 18 days carpenter work, Jobbing Shop.
2364	Abstract				
	C	James Foley	4/38	\$ 17.72	Carpenter work
		Lewis Wernwag	4/38	\$ 70.28	for lumber
		Joseph Spencer	4/38	100.12	Mason work
2nd quarter subtotal, 1838				\$ 188.12	
Total -exclusive \$ 266.73 materials charge				\$ 1,331.35	1837-38

To Joseph Spencer, brick mason: \$ 561.75.

To James Foley, carpenter work: 219.33. Bldg. No. 5 on Map. 6 (1848).

* ; 1716-61A Sept. 13, 1837 To William Fawcett, \$ 49.90 for plastering, possibly in the job shops for filers and smiths.

5. Jobbing Shop for Smiths and Spring-makers, 1837:

The appropriation of March 1, 1837 provided \$ 1,048.00 "for erecting a jobbing shop for smiths and spring-makers, 25 feet by 25 feet, of brick²⁰ (and one-story in height)."

Construction on this shop got underway late April or early May and the structure was finished by the end of July 1837. Total cost of the jobbing shop for smiths and springmakers was approximately \$ 985.50 (See Chart page 78).²¹ The stone mason John M. Cliven laid the stone foundations, containing 86 perches of stone mortar wall, of the shop. Brick layer Joseph Spencer laid 25,779 bricks in the one-story high walls of the edifice. James Foley did the carpenter work and William Bayley slated the roof. The vouchers for the carpenter work (see Chart page 78) indicate that the new workshop had eight windows and one exterior door. The door was of the eight-panel type. This is Bldg. No. 2 on Map No. 6 (1848), P. 72.

6. Tilt Hammer or Barrel Welding Shop, 1837-38:

The sum of \$ 2,995 was made available under the appropriations act of March 1, 1837 "for erecting a tilt-hammer shop, of stone, 35 feet long, 20 feet wide, and 15 feet high, and machinery for the same."²²

Construction on this shop, which was also known as the Barrel Welding Shop, got underway in August 1837 and the building was completed by the end of April 1838 at a cost of approximately \$ 2,133.08, exclusive of the machinery.²³ (see chart, page 80). The mason Jacob Picking did the stone and brick work on the edifice. He laid 69 perches of stone in mortar wall in the forbay,

20. . From Special Estimate for additional funds for 1837, in ASP-MA, VI, p.977.

21. R.G. 217- files 1423, 1716, 2090, and 2364.

22. Special Estimate for additional funds for 1837, in ASP-MA, VI, p.977.

23. R.G. 217- files 1423, 1716, 2092, 2094, 2364.

Jobbing Shop for Smiths and
Construction of Spring-Makers, 1837 Rifle Factory

Record Group 217: File No. Voucher		Artisan	Date	Amount	Remarks
No.					
1423	175	John M. Cliven	5/12/37	\$ 179.33	For excavating 29½ cubic yds of earth, \$ 7.33; For furnishing and laying 86 perches of stone in mortar wall, foundation of Jobbing shop for smiths.
1423	177	James Foley	6/17/37	\$ 19.62	Carpenter work, making 8 window frames and 1 door frame, jobbing shop for smiths
1716		William Bayley	8/2/537	\$ 95.00	For slating 9½ squares of roof, jobbing shop for smiths.
1716	123C	Joseph Spencer	9/30/37	\$ 50.00 *	Furnishing and laying 5,000 brick for jobbing shop for smiths.
2092	170C	Joseph Spencer	12/14/37	\$ 150.00 *	For furnishing and laying 15,000 brick for jobbing shop for smiths.
2092	4th quarter 1837			\$ 313.32	for materials issued for shop, last 6 months of 1837.
2094	35a	James Foley	11/14/37	\$ 27.12	Carpenter work, making 9 lintels and one 8- panel door for jobbing shop for smiths.
2364	Abstract C 122C	James Foley Joseph Spencer	1838 2nd qr " "	\$ 59.65 \$ 32.60 \$ 27.05 *	For Jobbing Shop, Smiths carpenter work, hanging 8 windows For laying 53 feet of cornice on jobbing shop for smiths.
Total		doec not included 313.32:		\$ 692.50	

* Note of 2364, May 28, 1838 stated Joseph Spencer did a total of the
Following work on the jobbing shop for smiths:

for laying	25,779 brick:	\$ 257.79
other brick work, arches, etc		53.54
laying 53 feet cornice		27.50
Total: Jospheh Spencer:		\$ 338.83
Total, James Foley, Carpenter		79.34

Bldg. No. 2 on Map No. 6 (1848).

and 95 1/3 perches of stone in mortar wall in the foundations and walls of the edifice. In addition Picking also laid 23,905 bricks in the walls of the new tilt hammer shop. The mason Joseph Spencer also worked on the structure in 1838. Lewis Wernwag constructed and laid 30 perches of dry wall in the tail race of the shop. James Foley did the carpenter work and William Bayley slated the roof. The vouchers indicate that the new tilt hammer shop had eight windows and two exterior doors. The two doors were of the eight panel type.

In his report to Col. Bomford, made on June 25, 1837, Lt. Col. Talcott had commented:

"In consequence of the ill health of Captain Hall, the Supt. (Lucas) had paid great attention personally and pressed on the above work," Talcott noted. ²⁴

Of the \$ 8,569.00 appropriated on March 1, 1837, the paymaster's vouchers indicate that approximately \$ 7,349.61 was expended in 1837 and \$ 1,124.97 in 1838, leaving a balance of \$ 94.55 available December 31, 1838. ²⁵

24. Inspection of Harper's Ferry Armory, 16th to 25th June 1837, HF NHP Photostat Collection, Vol. 1, pp.73-74.

25. R.G. 217-file 1423, 1716, 2092, 2364, 2094, 2729, 3434. Also see Serial No. 344, pp.392-395-"Statement showing the amount applicable to expenditure, and the amount expended in the service of the Ordnance Department, during the year ending 30th September, 1838", Balance available in hands of paymaster, 30th Sept, 1838" \$ 94.43." In the Statement of Operations of the Armory at Harper's Ferry, Virginia, during the year 1837", made by the Ordnance Department to Congress, it is printed that only " \$ 3,720.85" was expended in permanent

improvements at the Hall Rifle Factory! This an error, made either by the person who wrote the Ordnance Department report or by the printer who set the report in type. The correct number- \$ 7,320.85 was inverted by someone to read " \$ 3,720.85"

Construction of Welding Shop, 1837-38

Rifle Factory

Record Group 217:					
File No. Voucher					
	No.	Artisan	Date	Amount	Remarks
1423	177	James Foley	6/17/37	\$ 31.00	Carpenter work, making 10 window frames and 2 doors with panels, for barrel welding shop.
1716	Abstract C 1170	Jacob Picking	8/20/37	\$ 138.00	For furnishing and laying 35 perches of stone for tilt hammer shop at R.F. For laying 34 perches of stone for forbay at Tilt hammer shop, \$ 68.00
1716	120C	Jacob Picking	9/1837	\$ 190.66	for laying 95 1/3 perches of stone wall in mortar, new barrel welding shop
1716	3rd quarter	Jacob Picking		277.37	23,905 brick laid in mortar= \$ 239.04; 8 1/2 perches of stone laid= \$ 17.00; 8 9 inch arches laid, 2 14 inch arches laid. 74 feet of cornice laid at \$ 12.33.
Subtotal Picking				\$ 606.03	Mason work
2092	1690	Abstract C. \$832.19	total of which \$ 161.09 was for labor.		
		To Lewis Wernwag, Nov. 22, 18 7,	\$ 45.00 for mason work-furnishing		
		and laying 30 perches of stone dry wall on tail race of new tilt	hammer shop at rifle Factory.		
2092	171	To Lewis Wernwag	Nov. 23/	\$ 41.00	For 41 feet of coping for tail race.
			1837		
Subtotal		Lewis Wernwag	11.37	\$ 86.00	mason work tail race
2094	141A	Joseph Spencer	11/10/37	\$ 31.50	for 10 1/2 days mason work building house over new cast iron water wheel, probably at Rifle Factory tilt hammer shop.
2094	35A	James Foley	11.14.37	\$ 75.09	Carpenter work at new tilt hammer shop, R.F., making 9 lintels, 4 windows frames and two 8-panel doors.
2364	Abstract C \$ 483.22 1st qr	Joseph Spencer	3/20.38	\$ 69.25	For brick and stone mason work at new tilt hammer shop at rifle factory.
2364	Abstract C 2nd Qr.	William Bayley	4/30/38	\$ 116.00	For slating 11,60/100 squares of slate roof trip hammer shop, R.F.
		James Foley	4/30/38	\$ 18.96	for 544 feet of flooring
		John Kennedy	4/30/38	\$ 10.38	For painting.
		John Price	4/30/38	24.37	For millwright work
Subtotal				\$ 180.64	
Total				\$ 2,133.08	\$ 1,078.51 for construction by builders.

7, Repairs to the Rifle Factory Bell Shop, 1840-41:

On May 2, 1840, George W. Tracey was paid \$ 11.25 for putting in a skylight in the roof of the Bell Shop (The Stockers and Machine Shop dating from 1808-09), Bldg. No. 13 on Map No. 6 1848).²⁶

On December 11, 1841 George W. Tracey and his "tender" received \$ 32.12²⁷ for repairing the slate roof of the Rifle Factory Bell Shop.

8. Other Repairs and Improvements at the Rifle Factory, 1839-41:

In the Special Estimate for the service of the Ordnance Department during the year 1838, Col. George Bomford requested an appropriation of \$ 4,491.00 for two projects at the Rifle Factory, namely:

1. For erecting a store house for iron and Stocks..... \$ 3,991.00
two story, brick, with slate roof, 75 by 25 feet.

This structure was intended to replace two old wooden buildings.

2. To rough cast the walls and slate the roofs of two dwelling houses located on the island near the tracks of the Winchester and Potomac Railroad..... 500.00

These residences were to be converted into store houses.²⁸

As has been mentioned, however, Congress failed to appropriate the requested money in 1838 and again refused to vote the \$ 14,600 in 1839 that Col. Bomford had said was necessary to make repairs and improvements²⁹ at the Rifle Factory.

26. R.G. 217- 5252- Voucher 112. dated May 2, 1840.
27. R.G. 217- 6718- 52- Dec. 11, 1841- Tracey received \$ 20.12 for 11½ days work slating, and his tender was paid \$ 12.00 for 12 days work "tending". The Bell shop was to be demolished in 1849- see R.G. 217. 3rd series- 9307- Voucher 44. Tracey helped take it down.
28. HF NHP Reel 20, Vol. 6, p. 618.
29. For estimates, see Reel 20, Vol. 6, p. 622, 624-625.

Chart No.

National Archives Record Group No. 217- Records of the United States General Accounting Office, Washington, D.C. Records of Second Auditor: Records and Accounts from the Paymaster of the U.S. Armory at Harper's Ferry, Virginia, relating to expenditures for Permanent Improvements:

1836 - 1841 RIFLE FACTORY IMPROVEMENTS 1837- \$ 8,569.00 appropriated in 1836									
YEAR	Tilt Hammer Shop	Browning Shop	Jobbing Shop for Smiths	Jobbing Shop for Filers	River Wall	TOTAL	1836 money DRILL SHOP	Total- 1836-37	
1836	0	0	0	0			854.03	854.03	
1837	1,469.22	1,118.91	925.85	1,605.00	1,535.22	\$ 7,349.61	167.56	7,517.17	
1838	663.86	4.50	59.65	188.12		1,124.97	0	1,124.97	
1839						0	0	0	
1840						0	0	0	
1841						0	0	0	
TOTAL:	\$ 2,133.08	\$ 1,123.41	\$ 985.50	\$ 1,793.12	\$ 1,535.22	\$ 8,474.58	1,021.59	\$ 9,496.17	
BALANCE LEFT:	0	0	0	0	0	\$ 94.42	2.41	\$ 96.83	
APPROPRIATION	2,995.00	1,114.00	1,048.00	1,538.00	1,874.00	8,569.00	1,024.00	\$ 9,593.00	

The Chief of Ordnance had better luck in 1840: on July 20 of that year Congress did appropriate \$ 14,600.00 in funds earmarked to be used for making repairs and improvements at the Rifle Factory.³⁰ The 1840 estimate failed to specify how this money would be used. On March 3, 1841, as has been noted, the Congress provided an additional \$ 38,000 for repairs and improvements at the National Armory at Harper's Ferry; the estimates and appropriations for 1841 did not mention the rifle factory and did not specify any projects.³¹

The vouchers issued by the Armory Paymaster, 1839-41, except for \$ 153.94, issued to pay for repairs made to the roof of the Rifle Factory and footnote No. 31 below) Bell Shop (see item 7 above) do not include any payments for repair or construction work done at the Rifle Factory during these years. It thus appears that most of the money provided in 1840(\$ 14,600.00) must have been used to help pay off the cost overruns that had been made in the manufacture of arms at Harpers Ferry during the years 1838 to 1841.

A Contemporary Description of the Rifle Factory, 1842:

In October 1834 there had been a total of 22 small brick, stone, and frame buildings standing at the Hall Rifle Factory on the Lower Hall Island. These included workshops, several storage buildings, and perhaps 2 or 3 dwelling. In 1842 the reported total of buildings was said to be 26, thus indicating a net gain of only four structures since 1834.

The Charles Town newspaper, The Virginia Free Press, on September 1, 1842, published the following description of the Hall Rifle Factory:

30. For 1840 estimates, see Reel 20, Vol. 6, p. 628-629; also Serial No. 364, Document No. 45, p. 18 and 22. For appropriations, U.S. Statues at Large, Vol. V, p. 406.
31. For 1841 estimates, see Reel 20, Vol. 6, pp. 631 and 633; Appropriations in U.S. Statues at Large, Vol. V, p. 434. R.G. 217-5785-67, 1st quarter of 1841-\$ 110.57 was spent for 1,198 feet of poplar pine to weatherboard the trip hammer shop at the Rifle Factory.

"At the Rifle Factory, there are three store houses, one office, 10 workshops, and four others in which the machinery is driven by water, three annealing houses, and five others for coal, lime, etc., Value of machinery: \$ 95,783."

Captain John H. Hall resided at Harper's Ferry from April 1819 to 1840, supervising the manufacture of his Patent Rifle. On January 14, 1840, he requested a leave of absence for reasons of health and left Harper's Ferry to go West in 1840. He never returned and died in Missouri on March 26, 1841.

On December 10, 1840, John H. Hall was paid \$ 380.00 for repairs and improvements that he had made to his Armory-owned dwelling house and lot on Camp Hill (For the Location of Captain Hall's residence on Camp Hill see 1833 map on p.39. This included erecting 58 panels of fence around his house and yard, valued at \$ 50.80.; \$ 5.00 for providing one marble slab for a hearth; \$ 5.00 for papering one room in his house; \$ 20.00 for paving with stone in front of his residence; \$ 150.00 for grading his yard; and \$ 150.00 for the planting of numerous fruit trees, vines, and plants in his garden. His former residence, House No. 164, is listed on the 1841 rent rolls as a two-story brick house, valued at \$ 2,500.

The U.S. Ordnance Department decided to discontinue the production of the Hall Patent rifle on October 12, 1843, and the final lot of these weapons came off the assemble line in 1844. (See Chart, page 85, for number of Hall rifles produced 1819-1844).

32. Virginia Free Press, September 1, 1842, p. 2, c.1.

33. Virginia Free Press, April 1, 1841, p.3, c.1.

34. R.G. 217- 5624-C Voucher 47.

35. Col. George Talcott, Chief of Ordnance, to Major Henry K. Craig, Superintendent of U.S. Armory at Harper's Ferry, October 12, 1843, orders to stop further production once the arms in process of manufacture had been completed, Reel 19, vol. 2, p.265.

Production of Hall Rifles and Carbines, 1819-1843

Year	Flintlock Rifles	Flintlock Carbines	Total
1824:	1,000	-	
1827	1,000	-	
1832	4,360	-	
1833	3,670	-	
1834	970	-	
1835	1,714	-	
1836	1,809	-	
1837	1,200	1,017	2,217
1838	2,934	-	
1839	0	-	components only (Jan. 1-Sep. 30, 1839).
1840	1,023	1,003	2,026
1841	190		
Total	19,870	2,020	21,890
	Percussion rifles	Percussion carbines	Total
1842	0	0	
1843	300	1,001	1,301
1844	2,700	0	
Percussion Arms	3,000	1,001	4,001
Grand Total 1819-44:	22,870	3,021	25,891

The total of expenditures for repairs and improvements at the Rifle factory appear to have amounted to approximately \$ 9,746.90 during the years 1836 to 1841 and may be summarized as follows:

Year	No. of New Bldgs.	Cost	River Walls	Repair of Bldgs.	Total
1836	1	\$ 854.03	\$ 0	0	\$ 854.03
1837	3	5,981.95	\$ 1,535.22	0	7,517.17
1838	1	1,221.76	0		1,221.76
1839	0	0	0		
1840	0	0	0	11.25	11.25
1841	0	0	0	142.69	142.69
Total:	5	\$ 8,057.74	\$ 1,535.22	\$ 153.94	\$ 9,746.90

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

The records of the Armory Paymaster indicate that no major repair or improvement work was done on either the U.S. Dam on the Shenandoah River or on the section of the Shenandoah Canal that passed through the Rifle Factory grounds during the years 1836 to 1841.

CHAPTER VISUMMARY OF THE HISTORY OF THE LOWER HALL
ISLAND, 1796 - 1819Use of the Hall Islands, 1796 - 1819:

From 1762 to his death in 1782, the Hall Islands had been the property of Robert Harper, a millwright, who in his will, had bequeath his land to the Wager and Rutherford families. In 1782, Harper's sawmill and flour mill were located on the lower Hall Island and his residence overlooked the Upper Island. Harper's old sawmill served as the Armory sawmill from 1798 to 1807. On March 3, 1806. President Thomas Jefferson granted the Potowmack(or Potomac) Company a right of way through the Hall Island lands so that the canal company could construct a new canal along the Shenandoah River. The company completed its canal, including two locks, in 1807. The old Harper-Armory saw mill was demolished to clear the site for the canal and the Canal Company erected a new sawmill on the Lower Hall Island, at a new site to replace the old building.

Armory improvement of the Shenandoah water power did not get underway until 1808-10, when the original manufacturing plant was greatly enlarged in order to increase the number of arms manufactured. In 1808-09 two one-story brick workshops with water-powered machinery, a grinding mill and a tilt hammer shop, were erected on the Lower Hall Island, adjacent to the 1807 saw mill. These three structures represented the sole Armory use of the water-power of the Shenandoah from 1808 to 1819.

The John H. Hall Patent Rifle Factory, 1819 - 1844:

Second in importance as a arms manufacturing plant, in terms of the number of arms produced and the water power available, was the Hall or U.S. Rifle Factory on an island in the Shenandoah. From 1819 to 1827, Captain John H. Hall's operations at his small rifle factory on the Shenandoah, intended to produce a rifle with truly interchangeable parts, were regarded as purely experimental and hence as little money as possible was spent on the construction of new buildings at his plant. From 1819 to 1824 his "factory" was comprised of two shops, a old frame saw mill that was converted into a machine shop with water wheel for his use in 1819 and a small smiths shop, also built in 1819. In 1824, however, he was permitted to make a large addition, which included another water wheel, to his machine shop. In 1825 four small brick shops were erected: a kiln for steaming rifle stocks, two annealing furnaces, and a small workshop. In 1827 the Armory made a large addition to the grinding mill, one of its two brick water shops that had been erected on the island in the Shenandoah in 1808-10, and then turned the mill over to Hall for his use in the same year. Also built for Hall in 1827 were a second smiths shop and a coal house. In 1828 a tilt hammer shop was also erected for Hall.

The expansion of Hall's Factory from two shops in 1819 to about 10 by 1828 was based on the fact that his patent rifle had passed extensive and intensive testing by the Ordnance Department in 1827 and in March of that year the Ordnance Department and Captain Hall signed a second contract which called for an increase in the production of his rifle. Hall's factory was thus being increased in size so that a larger number of patent rifles could be turned out.

In 1831 Hall took over from the Armory its last water shop on the island-the old trip hammer shop dating from 1808-09. This was converted into shop for grinding rifle barrels and a shop for stocking rifles. Built in 1831 were a small charcoal house, small filing shop, furnaces, with small frame buildings over them, for annealing barrels and for hardening ramrods, five structures in all. A second small filing shop and a fire engine house were added in 1832. Other former Armory facilities on the Lower Hall Island, such as store houses for coal and iron, were also turned over to Hall in the early 1830's, when the Armory ended its operations on that island. In 1835 two brick structures, an annealing shop and annealing furnace, were constructed to replace the older structures of this type. As Hall's plant expanded, additional water was needed to turn the wheels in the Rifle Factory shops. To accomplished this objective, additional water power rights on the Shenandoah were purchased in 1833 for \$ 2,600.00 and in 1834 the U.S. Dam on the Shenandoah was thoroughly repaired and also extended across the river. at a cost of \$ 1,999.50.

During the years 1836 to 1841, Hall's Rifle Factory on the Shenandoah became a part of the regular Harper's Ferry Armory operations. The special estimates requesting funds for making repairs and improvements for the Armory, for the first time, also included requested money for similar projects at the Rifle Factory. Congress thus appropriated \$ 9,593.00 earmarked for the construction of five stone and brick workshops intended to replace five similar frame shops of makeshift construction.

The new shops were comprised of a Drill Shop, 1836; a Browning or Vitrol Shop, 1837; a Jobbing Shop for Filers (1837); a Jobbing Shop for Smiths and Springmakers (1837); and the tilt hammer or barrel welding shop for rifles (1837-38). A stone river or flood guard wall 250 feet long, 12 feet high and six feet thick was constructed in 1837 at a cost of \$ 1,535.22 to protect the Rifle Factory shops from high water.

In October 1834 the Rifle Factory plant on the Lower Hall Island was comprised of 22 small brick, stone, and frame structures. In September 1842, the number of buildings was reported to be 26 and their estimated value amounted to \$ 95,783.00. Expenditures for repairs and construction at the Hall Rifle Factory, 1819 to 1841, was approximately as follows:

Period	For Bldgs., Walls, Bridges
1819-21:	\$ 4,130.14
1822-29	\$ 17,699.28 (A)
1830-35	\$ 14,671.46 (1)
1836-41	\$ 9,746.94
Total:	\$ 46,247.82

(A) does not include \$2,533.00 spent by Armory for buildings on island.

(1) does not include \$ 2,206.68 spent to repair and rebuilt Shenandoah dam.

This total, \$ 46,247.82 for buildings, etc., suggests that the 1842 estimated value of \$ 95,783.00 must have included a figure of about \$ 49,535.00 as the value of the machinery in the Rifle Factory shops.

After living at Harpers Ferry from April 1819, Captain John H. Hall left the town in 1840 for reasons of health and died on March 26, 1841. The Ordnance Department decided to stop producing Hall Patent rifles on October 12, 1843 and the last parcel of the patent rifle was completed at the Harper's Ferry Armory in 1844. A grand total of 25,891 Hall arms were produced at the U.S. Rifle Factory at Harper's Ferry from 1819 to 1844. This included 19,870 flintlock rifles, 2,020 flintlock carbines (1819-41); and 3,000 percussion rifles and 1,001 percussion carbines (1842-44).

Total expenditures on the Lower Hall Island from 1819 to 1841, including Armory and Hall buildings, the canal and dam, appears to have been about \$ 52,648.82.

Of the 26 structures reported as standing on the Lower Hall Island in 1842, only two two-story stone buildings were destined to be still standing in 1859-61. One was Hall's blacksmiths or forging shop,¹ 30 by 30 feet and erected in 1819, which was remodelled into a stock house in 1854. The other, a two-story stone edifice with an exterior stairway to the second floor, was probably Captain John H. Hall's Office and Store House, built 1827-33, and repaired² and remodelled for use as a storehouse in 1853.

Additional data on the repairs made to the other 24 buildings and the demolition of this structures, 1842 to 1851, will be found in the appendixes of this report.

1. This is Bldg. No. 8 on the 1859 historical base map.
2. This is bldg. No. 10 on the 1859 historical base map.

DESCRIPTIVE CATALOG OFRIFLE FACTORY BUILDINGS, LOWER HALL ISLAND, 1798-1841:1. Harper's Saw Mill, ca. 1776-1806:

Map No. 1 indicates that Harper's Saw Mill was located at the lower end of the Lower Hall Island approximately at the point where the lower locks of the Shenandoah Canal were to be constructed in 1806-07. (Map No. 1, (1803), page 4.

Robert Harper constructed this frame sawmill on the Shenandoah prior to his death in 1782. The U.S. Armory acquired the mill when the U.S. Government purchased the structure and 311 acres of land for \$ 10,000.00. in 1797. The Armory used the old mill to saw lumber to be used in the construction of Armory buildings at the U.S. Musket Factory and Arsenal Square, 1798 to 1806.

Harper's former sawmill was apparently demolished in 1806-07 when the Potomac Company constructed the 1st and 2nd locks, known as the "Lower Locks" of the Shenandoah Canal at the lower end of the Hall Island. (See Map No. 2 (1807), p. 8.).

2. "New" Armory Saw Mill, 1806- 1836 (Hall's Machine Shop):

This structure is "G"-new sawmill on Map No. 2, (1807), p. 8; Bldgs No. 17 on Map No. 4 and Map No. 5, pp. 55-56; and is missing from Map No. 6, p. 72.

The Potomac Company probably constructed this "new" sawmill for the Armory in 1807 at site G, Map 2 to replace the old Harper's sawmill which had been demolished to clear the site for the construction of Locks No. 1 and 2 of the Shenandoah Canal. The 1810-11 inventories of buildings thus list one Armory sawmill but provide no further description.

Captain John H. Hall came to Harper's Ferry to begin the manufacture of the Patent Rifle for the U.S. in April 1819. In the fall of that year he was given the use of the Old (1807) sawmill as his machine shop. It was estimated that \$ 600.00 would be required to convert the mill for Hall's use and to provide a water wheel to turn Hall's machinery. Robert Painter did the millwright work on the machine shop, receiving \$ 207.79 for his efforts which included constructing a wooden water wheel 12 feet in diameter.

The 1821 inventory of Armory buildings described Hall's Machine shop as a one-story frame structure 50 by 16 feet in size and the estimated value was given as \$ 500. The converted sawmill thus served as John H. Hall's principal workshop from 1819 until 1827.

In 1824-25 the machine shop was considerably enlarged at a cost of approximately \$ 1,653.75. The new wing was apparently of frame construction like the original section. About 229 cubic yards of earth were removed to construct the new forebay and 283 perches of stone wall were laid in the forebay and tail race of the addition. A second wooden water wheel 10 feet in diameter was built and installed in the new wing in 1824.

Bldg. No. 17 on Maps No. 4 and 5 (1834) (pp. 55-56) is probably the Hall Machine Shop of 1819 that was enlarged in 1824-25. Bldg. 17 is a T-shaped structure about 50 by 16 feet with 32 by 16 feet arm that projects eastward from near the center of the original structure.

By 1834 the old Machine Shop was apparently serving as Hall's drilling shop. In requesting funds to replace the frame structure with a new brick drill shop, 50 feet long, 17½ feet wide, and one story high, the Chief of Ordnance explained to Congress that the shop "at present used for this purpose being an old wooden building very like to take fire. and from its position, to endanger other shops and machinery" should be demolished and replace with the brick building. The new brick drill shop (item 24 below) was constructed in the fall of 1836. The old machine shop was demolished and the brick drill shop was erected on the same site. The 1836 brick drill shop is Bldg. No. 18 on Map 6 (1848), p. 72.

3. The Grinding Mill, (or Bell Shop), 1808-1849:

This workshop is Bldg. No. 16 on Maps No. 4 and 5 (1834), pp. 55 - 56; and Bldg. No. 13 on Map No. 6 (1848), p. 72. It was located on the north side of the Hall Island and just west of Sawmill-Machine Shop (1807-1836) (item 2 above).

Designed and erected in 1808-09 by Superintendent James Stubblefield and Paymaster Samuel Annin, this water shop was Bldg. No. 9 on the 1810-11 inventories of Armory buildings. The structure was described in 1811 as a one-story brick building, 80 by 45 feet size, with "Machinery for heavy grinding (barrels &c.,)". The roof was cover with wooden shingles. The 1821 building inventory lists the shop as the grinding mill, one story, brick, 85 by 40 feet, and valued at \$ 6,000. The mill had one water wheel.

The Armory operated the grinding mill from 1808 to 1827 in conjunction with its production of arms at the U.S. Musket Factory on the Potomac. Musket barrels were transported from the Musket Factory to the shop on the Shenandoah for heavy grinding and then carried by wagon back to the Potomac workshops to be completed. In the fall of 1827 the Armory spent \$ 1,500 making a stone addition to the 1808 brick mill to contain the half stocking machine required in the production of the Hall Patent Rifle. Included in this construction was the building of a new head and tail race for the mill. About 459½ perch es of stone went into the walls of the addition and its races.

The enlarged grinding shop was then turned over to John H. Hall for his use. Lewis Wernwag did the millwright work on the addition. This included the construction of a water wheel (wooden) 10 feet in diameter and a shaft 18 feet in length and 23 inches in diameter, together with the other necessary fixtures, for turning the half stocking machinery in the new wing. Wernwag received \$ 336.00 for his services. The enlarged shop, which now had two water wheels, went into operation under Hall's charge in November 1827. The roof of the old grinding mill and new wing were slated, probably in 1827. In December 1828 a cupola or belfry, with a bell to call his men to work and to sound the hours, was added to the roof of the grinding-stocking shop. The building was henceforth usually refered to as the Rifle Factory" Bell Shop."

The enlarged shop, Bldg. 16, is shown on Maps 4 and 5, in 1834. Drawn roughly to scale, the shop measures about 85 by 45 feet and has a 20 by 20 foot addition to the west end, at the southwest corner on these maps. In late April 1840 a sky light was installed in the roof of the Bell Shop at a cost \$ 11.25 and the slate roof of the shop was repaired in 1841 at a cost of \$ 32.12.

The old Bell Shop was demolished in the spring of 1849 to clear the site for the construction of a new Tilt Hammer and Forging Shop, Bldg. No. 4 on the 1859 Historical Base Map. The slater George W. Tracey received \$ 26.59 in 1849 "for taking off and securing the slate roof of the old Bell Shop at the Rifle Factory, 5,319 feet, to make room for a new shop."(1)

4. Tilt Hammer Shop, 1808- 1837:

This shop is probably Bldg. No. 7 on Maps No.9 and 10(1834) pages 298-299. The tilt hammer shop was located on the north side of the Lower Hall Island and a short distance west of and in a line with the 1808 Grinding Mill (Item 3) and the 1807 Saw Mill-Machine shop(Item 2). The 1808 Tilt Hammer Shop was apparently demolished in 1837 and replaced by the new Tilt Hammer building that was erected in 1837-38. This latter structure, built on the site of the 1808 workshop, is shown as Bldg. No. 7 on Map No. 21(1848), page 419.

The Tilt Hammer Shop was designed and erected by Superintendent James Stubblefield and Paymaster Samuel Annin in 1808-09. The structure was described in the October 1811 inventory of buildings as a one-story brick shop, 45 by 45 feet in size, designed to operate four tilt hammers, but only two of the intended four trip hammers had been installed by that date.

The water shop had one water wheel and its roof was covered with wood shingles.

The shop is listed in the 1821 building inventory as the "furnace and forges" shop, one story, brick, 45 by 45 feet, and valued at \$ 4,000.

The Tilt Hammer and Furnace Shop was operated by the Armory in conjunction with the production of arms at the U.S. Musket Factory from 1808 to 1831. In 1830 the shop was described as a "one story brick building in defective state, in which two tilt hammers are now worked and a forge hammer, the later for the furnace. In June 1831 the Armory turned over this old workshop to Captain John H. Hall for use in the production of the Patent Rifle.

In 1831 the shop was repaired and one portion converted at a cost of \$ 638.58 for use as a stocking shop for Hall Rifles. In 1832, at a cost of approximately \$ 1,000, the remaining portion of the old tilt hammer shop was converted into a mill for grinding rifle barrels, ramrods, and bayonets. The roof of this workshop was slated, probably in 1829, in order to reduce the danger from fire.

The 1808 Tilt Hammer/ Grinding Mill and Stocking Shop was apparently demolished in July 1837 in order to clear the site for the construction of a new Tilt Hammer or Barrel Welding Shop on the same location. Work on the new stone structure was underway in August 1837. (See item 28 below).

On Maps No. 9 and 10, made in 1834, Bldg. No. 7, the probable 1808 Tilt Hammer Shop-then a Grinding Mill and Stocking Shop, appears to have been enlarged in the 1831-32 work from square 45 by 45 structure into an L-shaped building by the addition of a 35 feet by 25 feet wing to the south side at the southeast corner.

5. Smiths Shop, 1819- 1861:

The Smiths Shop is Bldg. No. 21 on Maps. No. 4 and 5 (1834), pages 55- 56; and it is Bldg. No. 22 on Map No. 6 (1848), p.72. The blacksmiths shop was located at the northern edge of the Lower Hall Island at the eastern tip and a short distance east of the 1807 Sawmill-Hall Machine Shop(item 2).

This shop was built for the use of John H. Hall in the production of his Patent Rifle in 1819. The blacksmith shop is described in the 1821 building inventory as stone, two-story, 30 by 30 feet, and valued at \$ 1,000. The roof was covered with wood shingles originally and these were replaced about 1829 by slate.

The structure had a chimney for each forge and these may have numbered four.

The 1819 structure was still being used as a "Forging Shop" in 1848. The

"old Forging Shop" was repaired and remodelled in 1854 for use as a stock house. Two new floors were installed as a part of this work. The Stock House, Bldg. No. 8 on the 1859 Historical Base Map, was still standing in 1861 and was destroyed by Confederate troops in June of that year.

6. Store House for Coal, 1822-1836? :

In 1822 the Armory erected a "House for the storage of stone coal at the Works of on the Shenandoah," at a cost of \$ 200. This was probably a small one-story stone structure and would have been utilized in conjunction with the operation of 1808 Tilt Hammer and Furnace on the Lower Hall Island from 1822 to 1831, when the tilt hammer shop was turned over to John H. Hall. Hall was probably also given the use of the Coal House in 1831.

The Store House for Coal may possibly be Bldg. No. 9 on Maps No. 4 and 5 (1834), pp. 55 -56. This structure, about 25 by 15 feet according to the maps, is conveniently located just to the southeast of Bldg. No. 7, which is believed to be the 1808 Tilt Hammer Shop(Item 4). There is no Coal House listed on Map No. 6 (1848), p. 72. By this date the 1822 store house for coal had been either demolished or removed from its original site; and if still standing, had been converted for use for some other purpose.

7. Store House for Iron, 1824-

In 1824 the Armory constructed a "Store House for bar iron at the works and the Shenandoah" at a cost of \$ 500. The stone structure, constructed by the mason Michael Walsh, had 225 perches of stone laid in its mortar walls. The building was either a one and one-half or two-story edifice, for in 1826 \$ 10.00 was spent for carpenter work in "fitting up a lodging room for the workmen over the iron house." The original roof was comprised of wood shingles and these were probably replaced by slate in 1829.

Iron intended for use at the U.S. Musket Factory on the Potomac was stored in the Iron House on the Hall Island from 1824 to 1834.

However, John H. Hall was apparently using at least part of the iron house by 1831, for he spent \$ 80.00 making repairs and improvements to the partition, rack, and flooring of the iron house in 1831.

In the fall of 1834 the Armory erected a new Store House for Iron, Steel, and a Bin for Coal at the U.S. Musket Factory on the Potomac. This new store house saved the cost of transporting the iron from the Iron House on the Shenandoah to the Potomac works. The old stone(1824) Iron House on the Hall Island was thus probably turned over completely for John H. Hall's use in 1834 or 1835.

The location of the Store House for Iron on the Lower Hall Island is not known. A possibility is Bldg. 8, which measured approximately 32 by 15 feet, on Maps No. 4 and 5, pages 55-56. The only reason for suggesting this structure for the iron house is that it was located in a line between the two Armory-operated watersheds, Bldg. 7 - The 1808 Tilt Hammer Shop(Item 4) and Bldg. No. 16- the 1808 Grinding Mill, thus situated in the small cluster of structures under control of the Musket Factory from 1808 to 1827 and 183. The old Iron House does not appear under this name on Map No. 6 (1848), p.72., thus indicating that the old building had either been demolished or converted to some other use.

8. House and Kilm for Steaming Rifle Stocks, 1825:

A small stone kilm for steaming rifle stocks was erected in 1825 at a cost of approximately \$ 52.00. About 60 perches of stone went into the kilm. The location of this structure on the Lower Hall Island is not known.

"A House for Steaming Stocks", Bldg. No. 15, appears on Map 6, p.72. (1848) just to the south of Bldg. No. 13, the 1808 Grinding Mill-Bell Shop(Item 3). This may be the 1825 kilm or a direct descendent thereof. However, no such building appears in the same location(south of Bldg. No.16) on Maps No. 9 and 5 (1834), pp. 55 -56. The 1848 House for Steaming Stocks, a very small edifice, has either been relocated or is a replacement structure for the 1825 kilm.

9. Small Brick Workshop, 1825.

In September 1825 a small brick workshop and two annealing furnaces containing 27,500 brick were erected for the use of John H. Hall. The location of the shop on the 1834 maps, No. 4 and 5, pp 55 - 56, and also on Map No. 6 (1848), p. 72, is unknown.

10. and 11. Two Brick Annealing Furnaces, 1825-1835:

In September 1825 two small annealing furnaces and also a small brick workshop were constructed from 27,500 brick for the Use of John H. Hall. The two annealing furnaces are probably Bldg. No. 19, about 12 by 10 feet, and Bldg. No. 20, also 12 by 10 feet, on Maps No. 4 and 5, pp. 55 - 56, drawn in 1834. These two shops were located on the north edge of the island, near the eastern tip, and adjacent(west) of Hall's 1819 Smiths shop (item 5) Bldg. 21 on the maps. In 1831 Hall spent \$ 29.19 constructing a frame shed in front of the old annealing furnaces. During the summer and fall of 1835 the two old annealing furnaces that dated from 1825 were demolished and replaced by a new brick Annealing House and Annealing Furnace which appear as Bldgs. No. 20 and 21, respectively, on Map No. 6, p. 72. The 1835-48 structures are located on approximately the same sites as the 1825-35 annealing furnaces that were tentatively identified as such above on the 1834 maps.

12. Smiths Shop, 1827- 1851:

This structure is Bldg. No. 22 on Maps No. 4 and 5, pp. 55 - 56, drawn in 1834, and it is "the Forging Shop-" Bldg. No. 19, on Map No. 6 (1848), page 72. The shop was located near the eastern tip of the Lower Hall Island and a short distance to the southwest of the 1819 Smiths Shop (Item 5).

This ~~one-story~~, one-story, stone smiths shop, 35 by 35 feet, with slate roof, was erected for the use of John H. Hall in 1827 at a cost of approximately \$ 1,404.29. The forging shop held four forges, each with its own chimney, so that four chimneys pierced the roof. The walls held about 481 perches of stone masonry, and these were erected by the mason Lewis Wernwag.

The Smiths Shop was used for its intended purpose from 1827 to about 1851, when it was demolished to clear the ground for the construction of a new Annealing Furnace and Proof House in that general vicinity.

13. Store House for Coal, 1827- 1836:

The Store House for Coal, containing 506 perches of stone mortar wall, was a stone structure with slated roof and apparently one-story in height. Edward Harding did the mason work and the total cost of construction in 1827 was about \$ 656.63. Because it was erected as a "Store House for the Same (the Smiths Shop (item 12) that was also being constructed for the use of John H. Hall), it seems highly probable that the Coal House was built adjacent to the 1827 Smiths Shop and the 1819 Smiths Shop (item 5).

If this logic was applied, then Bldg. No. 18, about 20 by 25 feet in size, on Maps No. 4 and 10 (1834), pp. 55 - 56, would be the most likely candidate for being Hall's 1827 Coal House. Bldg. No. 18, located on the northern side and near the eastern tip of the Lower Hall Island, is situated in the midst of the cluster of structures under Hall's immediately control in 1827, namely Bldgs. No. 16, 17, 19, 20, 21, and 22 on the 1834 maps.

The Coal House is missing from Map No. 6 (1848), p. 72, and its probable site is occupied by Bldg. No. 18, the "Drill Shop", which was definitely constructed at this location in 1836. This indicates that the 1827 Coal House was either demolished or removed to a new location to clear the site in 1836.

14. Tilt Hammer Shop, 1828 - ca. 1844:

This structure, labelled "Tilt Hammer" by the engineers on their map in 1834, is Bldg. No. 5 on Maps No. 4 and 5 (1834), pp. 55 - 56. This is also probably the tilt hammer shop that was erected for John H. Hall's use in 1828.

The tilt hammer shop, a one-story stone building, 45 by 45 feet, with a slate roof, was apparently constructed in 1828 for Hall's use. The shop had a water wheel and machinery. By 1834, however, the tilt hammer shop appears on the maps as an L-shaped building about 75 by 35, with a 20 by 24 foot wing at the southeast corner on the east side. A long narrow extension, 90 by 18 feet also runs east and crosses over the raceway.

The 1828 tilt hammer shop is missing from Map 6 (1848), p. 72, and must have been demolished about 1844 to clear the site for the construction of new buildings No. 4 or 1 on the 1848 map.

15. Store House for Charcoal 1831-

A small Charcoal House was constructed in 1831 at a cost of of \$ 107.40. This price suggests that it may have been a frame building, if not, then a small one-story stone structure.

The location of the Charcoal House on Maps No. 4 and 5 (1834), pp. 55 - 56, is not known. The Store House does not appear under its name on the 1848 Map, No. 6, p. 72.

16. Furnace and Shop for Annealing Rifle Barrels, 1831

A furnace with a building over it was construction in 1831 at a cost of \$ 103.24½, suggesting that the stone or brick furnace was covered by a small frame structure.

The location of the Annealing Shop on Maps No 4 and 5(1834), pp. 55 -56, is not known. Map No. 6(1848), p. 72, has Bldg. No. 6- "a Barrel Welding Shop", which may possibly be the 1831 Annealing Shop.

17. Furnace and Shop for Hardening Ramrods, 1831-

A furnace for hardening ramrods, with a building to cover it, was erected in 1831 at a cost of \$ 122.81. The fact that Bldg. No. 9 on Map 6 (1848) is labelled the "Rod Tilting Shop", suggests a possibility that Bldg. No. 8, about 15 by 32 feet in size on Maps No. 4 and 5 (1834), pp. 55-56, might be the 1831 shop. This is speculation, however, and if correct, then Bldg. No. 8 on the 1834 maps could not be the 1824 Iron House, as suggested under item No. 7 above. Bldgs. No. 8 and 9 on the 1834 and 1848 maps, however, appear to occupy the same site on each map.

18. Shop for Filers, 1831- 1837

A square shaped frame filing shop was constructed in 1831 at a cost of \$ 139.40. The location of this small workshop on Maps No. 4 and 5(1834), pp. 55 - 56 is not known. The building was probably replaced by the construction of a large new brick jobbing shop for filers in 1837, see item 26 below.

19. Filing Shop ,1832-1837:

A one-story, probably frame, filing shop, 17 feet square, was apparently constructed for John H. Hall in 1832 at a cost of approximately \$ 250.00. The location of this small workshop on Maps No. 4 and 5(1834), pp. 55 - 56, is not known. The 1832 workshop was probably replaced by the construction of a two-story brick jobbing shop for filers in 1837, see item 26 below.

20. Engine House, 1832-ca.1843:

A house to store the fire engine, apparently a small one-story frame structure, was erected at the Rifle Factory in 1832 at a cost of approximately \$ 100.00. The location of the Fire Engine House on Maps No. 4 and 5(1834), pp. 55 - 56, is not known. The location of a replacement structure, erected in 1843-44, appears as Bldg. No. 16-the "Engine House" on Map 6(1848), p. 72.

21. Captain John H. Hall's Office, ca.1827: - 1861 (?):

The engineers in 1834 labelled Bldg. No. 15 on Maps No. 9 and 10(1834), pp.298-29, as "Capt. Hall's Office." Bldg. No. 10, the "Inspectors' Office," on Map No. 21(1848), p.419, which is situated about on the same site as Hall's Office, may be the same office building 14 years later.

Captain Hall's Office, probably a frame structure and about 30 by 35 feet in size, was erected at some undetermined date, but probably about 1827, when he and the United States entered into the second contract to produce his patent rifle.

In 1853 it was reported "storehouse repaired; outside stairs removed and new stairs put up inside." This suggests that Hall's old office and storehouse may have been remodelled in 1852. The repaired storehouse was still standing in 1861 and was destroyed by Confederate troops in June 1861.

Remarks on the 1834 Maps, Nos. 4 and 5:

Maps No. 9 and 10, drawn in 1834, reveal that there were a total of 22 structures standing on the Lower Hall Island at that date.

Dwelling Houses for Hall's Employees

Three dwelling houses, probably of stone and costing about \$ 450 each, or a total of \$ 1,350.00, were erected to house employees of the Rifle Factory in 1819. A fourth residence, a log house, was built in 1825 at a cost of \$ 102.75. In 1827-28 Captain John H. Hall was also permitted to erect a new residence for his use on Camp Hill. Two more dwelling houses were apparently constructed for Hall employees in 1828, for the rent rolls indicate that Hall and six of his workmen occupied a total of seven dwellings by 1829. In 1831 kitchens were added to two of the dwellings at a cost of \$ 433.71½ and \$ 76.45 was expended to make repairs to three other of his workmen's residence. The six dwelling houses of the workmen were probably located on the Upper Hall Island, but soem early ones may have been situated on the Lower Hall Island.

Winchester and Potomac Railroad Company Right of Way:

On January 27, 1835, the United States granted the Winchester and Potomac Railroad Company a 30 foot-wide right of way across the Upper and Lower Hall Islands. The company constructed its two tracks on a 14 foot high wooden trestle across these islands in 1835 and began operations in 1836.

Bridges to the Hall Islands:

The first bridge to the Lower Hall Island would have been required after the Shenandoah Canal and its Lower Locks had been completed in 1807 and particularly after the Armory erected its brick water shops, the Grinding Mill and Tilt Hammer Shop, on the Lower Island in 1808-09

Operations on the island expanded in 1819, when John H. Hall began work on his Patent Rifle in two shops, and three residences may also have been built on the Lower Island. In 1820 \$ 230.12 was spent constructing two stone bridges at the Lower Island. One, consisting of 78 perches of stone wall, was bridge over the tail race of one of the three water shops on the island. The second stone bridge, which had a brick arch, spanned the Shenandoah Canal. This structure contained 120½ perches of stone wall, cost about \$ 136.12, and was completed in December 1820.

In 1828 the Armory spent \$ 333.00 (one-third of the cost) of building a \$ 1,000 wooden bridge "over an arm of the Shenandoah;" this bridge may have gone to Virginus Island, which was then being developed and in which Superintendent James Stubblefield had a vested interest. Map No. 5, p. 56, shows the state of the bridges to the Hall Islands in 1834, with one crossing from the main land to the western portion of the Lower Hall Island and then by means of a road leading westward proceeding via a second small bridge over a waterway from the Lower to the Upper Hall Island.

Flood Guard Walls:

As a result of experience in the great Shenandoah flood of 1810, the Armory apparently constructed a guard wall and embankments to protect its two water shops on the Lower Hall Island. In 1831 Captain John H. Hall increased the thickness of the flood protection embankment that lay to the southwest of his shops by four feet and its height by three feet at a cost of \$ 252.40½. This work involved the construction of a stone wall and raising the embankment.

The location, width, and extent of the flood guard wall and embankment as it existed in 1834 is clearly shown on Maps. No. 4 and 5 (1834), pp. 55 - 56. The embankment, according to Captain Hall, was more than 20 feet thick.

As a result of the flood of 1836, which seriously threatened Hall's Rifle Factory plant, the Captain strengthened the existing embankment by construction a strong wall of stone parallel to the old embankment - a few feet from it, and extending down to solid rock below which is within about two feet of the surface. The proposed wall was to be six feet thick, 12 feet high, and about 250 feet long. The area between the new stone wall and the old embankment was then to be filled in with about 1,500 cubic yards of earth. Hall estimated that the new wall would require 720 perches of stone. As constructed by Lewis Wernwag and Anthony Storm in 1837 at a cost of \$ 1,535.22, 309 perches of stone in mortar wall was built and 2,232½ cubic yards of earth embankment was made. This suggests that 1837 stone flood wall, as actually built, was probably about 6 feet thick, 250 feet long, but only about six feet high. On the other hand, about 700 additional cubic yards of fill for the embankment was made than had been estimated.

Shenandoah Street River Wall, 1823.

In 1823 the Armory spent \$ 2,088.00 to have 2,088 perches of stone wall erected between the road leading to the Hall Rifle Works and the Shenandoah River and for filling in with earth behind the new wall.

In 1823-24 an additional \$ 342.50 was spent to raise the bank of the Shenandoah Canal two feet in height for a distance of 76½ rods, and in width ranging from 10 to 12 feet, with earth. The purpose of this construction was to prevent the canal from overflowing.

Rifle Factory Buildings erected 1835-1841:

22. Annealing Shop, 1835 - 1851:

This is Bldg. No. 20 on Map No. 6 (1848), p. 72.

The Annealing Shop, a one-story brick structure containing 26,978 bricks and stone foundations, was erected by the mason Joseph Mullen in 1835. Its interior was plastered and the roof contained 1,143 square feet of slate. Total cost of construction was probably about \$ 1,000.00.

The 1835 Annealing Shop replaced the 1825 Annealing Furnace and its 1831 wooden shed (See items 10 and 11 above)-which appeared as Bldg. No. 19 on Maps No. 4 and 5 (1834), pp. 55 - 56.

The 1835 Annealing Shop, in turn, was demolished in 1851 in order to clear the ground for the construction of a new Annealing Furnace and Proof House(Bldg. No. 5 on the 1859 Historical Base Map).

23. Annealing Furnace, 1835- 1851:

This is Bldg. No. 21 on Map No. 6 (1848), p. 72.

The Annealing Furnace, a one-story brick structure containing 14,235 bricks and stone foundations, was erected by the mason Joseph Mullen in 1835. The interior of the shop was plastered and its roof, 444 square feet, was slated. Cost of Construction was probably about \$ 500.00.

The 1835 Annealing Furnace replaced the 1825 Annealing Furnace (see items 10 and 11 above), which appeared as Bldg. No. 20 on Maps No. 4 and 5, pp. 55 - 56.

The 1835 Annealing Furnace for rifle barrels was demolished in turn in 1851 to clear the site for the construction of a new annealing furnace and proof(Bldg. No. 5 on the 1859 Historical Base Map) in the same location.

24. The Drill Shop, 1836-1849:

The Drilling Shop is Bldg. No. 18 on Map. No. 6 (1848), p. 72.

Erected in 1836, this structure replaced "an old wooden building very like to take fire, and from its position, to endanger other shops and machinery "(This is item 2 above, and Bldg. No. 17 on the 1834 maps, No. 4 and 5 , pp. 55 - 56).|

The 1836 Drill Shop, constructed by the mason Joseph Spencer at a cost of \$ 1,021.59, was a one-story brick building with slate roof and stone foundations. The workshop was 50 feet long and 17½ feet wide. The foundation walls contained 62 perches of stone mortar wall, the upper walls 25,311 bricks, and roof 16 3/4 squares of slate. The shop apparently had two outer doors and 12 windows. Interior walls were plastered one coat.

The 1836 drill shop was demolished in 1849 in order to clear the site for the construction of a new Tilt Hammer and Forging Shop(Bldg. No. 4 on the 1859 Historical Base Map).

25. The Browning or Vitriol Shop, 1837 - 1850:

This structure is Bldg. No. 3-"The Vitriol Shop"-on Map No. 6(1848), p.72.

The shop for browning rifle barrels was erected at a cost of \$ 1,118.92 by the mason Joseph Spencer in 1837. The Browning Shop was a two-story brick structure, 20 by 22 feet, with slate roof and stone foundations. The foundations contained about 75 perches of stone in mortar masonry, the 1st and 2nd story walls were comprised of 31,104 bricks, and the roof was covered with 7 and 26/100 squares of slate. The interior walls were plastered. The shop had one door, 10 windows, and 1,388 feet of flooring.

The Browning or Vitriol Shop was demolished in 1850.

26. The Jobbing Shop for Filers, 1837-1852:

This workshop is Bldg. No. 5 -"Filers Shop-Old", on Map No. 6 (1848), page 72.

The Jobbing Shop for Filers was constructed by the mason Joseph Spencer in 1837 at a cost of approximately \$ 1,538.00. The Filers Shop was a two-story brick structure, 20 feet high, 25 by 22 feet in size, with stone foundations and a slate roof. The foundations contained about 112 perches of stone mortar wall; the upper walls were comprised of 43,980 bricks, and roof had 19½ square of slate. The shop had two doors, 18 windows and 2,400 feet of flooring. The doors in this and the other workshop erected in 1836-37, were of the eight-panel type.

The 1837 Filer Shop replaced the two small frame filer shops that had been constructed in 1831 and 1832(see Items 18 and 19 above).

The brick 1837 Jobbing Shop for Filers, in turn, was demolished about 1852 to clear the site for the construction of a new machine shop(Bldg. No. 6 on the 1859 Historical Base Map.).

27. Jobbing Shop for for Smith and Springmakers, 1837-ca. 1850.

This shop is probably Bldg. No. 2-"The Forging and Tempering Shop"-on Map No. 6,(1848), page 72.

The Jobbing Shop for Smiths and Springmakers was constructed by the mason Joseph Spencer in 1837 at a cost of approximately \$ 985.50. The shop was a one-story brick structure, 25 by 25 feet, with stone foundations, and a slate roof. The foundations contained 86 perches of stone mortar walls; the upper walls were comprised of 25,779 bricks, and the roof held 9½ squares of slate. The jobbing shop had eight windows and one door.

The Shop for Smiths and Springmakers was demolished about 1856 to clear the site for the construction of the addition to the Finishing and Machine Shop, Bldg. No. 3, Bldg. 3A, erected in 1856-57.

28. Tilt Hammer or Barrel Welding Shop, 1837 - 1851:

This structure is Bldg. No. 7, "The Tilt Hammer Shop", on Map No. 6 , p. 72.

The Tilt Hammer and Barrel Welding Shop was constructed by the mason Jacob Picking at a cost of approximately \$ 2,133.08; with the water wheel and machinery included, the cost was probably about \$ 2,995.00. The tilt shop was a one-story, 15-foot-high brick structure, 35 by 20 feet in size, with a stone foundation and a slated roof. The stone foundations contained about 95 1/3 perches of stone in mortar walls and the brick superstructure was comprised of 23,905 bricks. The roof held 11 60/100 squares of slate. The Tilt Hammer and Barrell Welding Shop had two doors of the eight pannel type, eight windows, and had 544 feet of flooring. This 1837-38 tilt hammer shop replaced the old brick tilt hammer shop that has been erected in 1808-09 (see Item 4 above-Bldg. No. 7 and Maps No. 4 and 5 -1834-pp. 55 - 56).

The 1837-38 Tilt Hammer Shop, in turn, was demolished in 1851 to clear the site for the construction of a large Machine Shop, Bldg. No. 6 on the 1859 Historical Base Map. On December 24, 1851, the mason Edward Tearney was paid a total of \$ 244.00 for providing the foreman and 12 men who worked 18 days each "taking down the machinery and building and clearing away the rubbish from the site for the new machine shop at the Rifle Factory."(1)

As has been mentioned, there were four buildings on the lower Hall Island in 1819, 22 structures in 1834, 26 buildings in 1842, and 23 in 1848.

This completes the roll of 28 workshops and store houses that are known to have been located on the Lower Hall Island during the years 1798 to 1841.

SUMMARY CHART: CATALOG OF ARMORY BUILDINGS, 1798-1841:

			U.S. RIFLE FACTORY			
Years:	No. of Bldgs.					
1802	1					
1811	3					
Year:	No. of Bldgs.	Value of Bldgs.				Hall, 1819-21 2 shops
1821	4	\$ 11,500.00				\$ 4,130.14
Years	No. of Blgs. built	Cost of new bldgs.	Walls	Wells	Bridge	Total expenditures on plant
1822-29:	10	\$ 7,277.31		100.00	333.00	\$ 20,232.28
1830-35	8	2,872.85	252.40			14,671.46½
1836-41	5	8,057.78	1,535.22			9,746.94
1822-41 Total	23	\$ 18,207.94	1,787.62	100.00	333.00	\$ 44,650.67
1819-41 Total:		\$ 29,707.94				\$ 48,780.81

1802": Saw Mill (Old Saw Mill of Robert Harper.) \$ 56,150.67

1811: Saw Mill, Grinding Mill, and Trip Hammer Shop. (New-1807-Saw Mill.)

1821: Grinding Mill, Trip Hammer Shop, Smiths shop for Hall, and Machine Shop for Hall ((forme. 1807 Saw Mill)).

YEAR	U.S. Rifle Factory	
	Workshops	Other
1803	1	0
1811	3	0
1821	4	1
1834	14	8
1841	14	12

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 thousand 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. Statues 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 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 usuallu accurate.

2. Smith, Merritt Roe, Harpers Ferry Armory and the New Technology - The Challeneg 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.

HISTORICAL SKETCHES AND PRINTS OF THE HALL RIFLE
WORKS, 1819 - 1844

No historical prints, drawings, or paintings showing Captain John H. Hall's Rifle Factory on the Lower Hall Island during the years 1819 to 1844 have been found.

APPENDIX NO. 11806 Right of Way for Canal

Harpers Ferry National Historical
Park Microfilm Collection, Reel 1 No.
22, Vol. 13, pp. 1265-1277. 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 a 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 warrent 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.

This agreement made this 23d day of April 1827 Between J. H. Hall of Harper's Ferry, Va., in the Service of the U.S. and acting by the consent and with the advice of Col. R. Lee, Superintendent of the U.S. Armory at that place, of the one part, and Lewis Wernwag, Bridge Builder of the Village and State aforesaid of the other part Witnesseth-

That the said Wernwag engages to make & deliver to sd. Hall, for the United States, by the end of July next the Articles herein specified, in good order, and secured in their proper places, fully completed, and ready for immediate use, at Harper's ferry-(Viz) a trunk for the conveyance of water from the Canal on the Shenandoah to a Smith Shop to be erected for the U. States which trunk is to be 2 feet Square and of such length as may be required, and is to be composed of good sound white oak plank free from _____ of three inches in thickness and well secured with Iron bolts at intervals of 2 feet at \$ 10.00 per rod, for every rod in length of the Trunk and at 15 cents per pound for the Iron bolts & nuts and washers-Said Wernwag providing all the Materials at his own expense as well as the labor on the Same,. But the Expense of the excavation for placing the Trunk is not included. Neither is it included in any of the Subsequent Articles.

The Said Wernwag Engages to make and deliver as above mentioned a Mill Shaft composed of four panelled pieces of Timber well bolted together for Forty Dollars. R The Shaft to be 18 feet in length and 23 inches in Diameter and to furnish the Screw Bolts for the Same, & the Nuts and washers at 15 Cents per pound and he engages to make & deliver for the said shaft as aforesaid a Water Wheel of 10 feet Diameter and seven feet length of Bucket at \$ 50.00 for the work and \$ 1.50 per hundred feet for the wooden Materials-.

He also engages to furnish the Materials for the head Blocks, and Spurs for the before mentioned Mill Shaft and to make and place them for \$ 9.00 (or 90.00?). Said Wernwag also engages to make and deliver at aforesd. a forebay for said Water Wheel planked with two-inch white oak plank, and lined with one Inch bands having a Yoke at every Three feet, with posts and sills of the size of 6 by 8 inches at \$ 38.00 for the work and the wooden materials. The stuff for lining not included.

He also Engages to furnish as aforesd a breast to the forebay for \$ 18.25 per rod including all materials- and he engages to make the fall, and Shute and gate for the water wheel furnishing all the Materials for \$ 14.00 for the whole. Said Wernwag Engages that all the Materials for the wooden work, in all the before mentioned articles shall be of good sound white oak. He also Engages to furnish the Masonry for a Smith Shop, for the U. States, and for a Store house for the Same at \$ 1.25 per perch, providing all the Materials at his own expense, Stones, Lime, Sand, &c.- laying the whole in Mortar and pointing the same- and he engages to execute the whole of the beforementioned articles:(viz., Trunk, Mill Shaft, water wheel, Cogwheel, head blocks, and spurs, Forebay, breast Fall and shute and gate, and masonry for smith shop and store house, in good and workmanlike manner, to the satisfaction of the sd. Hall and the Superintendent of the Armory on or before the last day of July 1827 and he engages that one quarter of the whole labor on the beforementioned Articles shall be performed as aforesaid by the last day of

Agreement between Lewis Wernwag and John H. Hall, April 23, 1827-Continued:

April immediately ensuing the date of this paper - That another quarter of it, shall be executed by the last day of May and another Quarter by the last day of June, and the remaining quarter, by the last day of July 1827, as above mentioned and that in case of his failing to execute the work within the periods, and in proportions just mentioned he will forfeit and pay to the sd. Hall \$ 200.00 and that the latter shall in that case be released from all obligations to said Wernwag arising from this instrument (and consequently the United States) and that said Hall may immediately after at his option proceed to have the work executed by other hands- and the said Wernwag engages in addition to the beforementioned forfeitures, to make good to the United States all the damages which may be sustained, by a failure on his part to Execute all and each of the Engagements before mentioned- and it is agreed that in consideration of the faithful performance of the foregoing Contract by the said Wernwag - the United States shall pay to him the sum to which the whole shall amount to at the rates above specified- the payments to be paid as the work progresses - and in proportion to the quantity executed at the periods indicated - In witness whereof the parties aforesd have hereunto set their hands and affixed their seals the day and year first above written. -It is to be understood, that no delay is to be occasioned to sd. Wernwag by not having having the Grinding Mill ready for him, but if that circumstance should occur- than the placing of the Mill Shafts is not to be exacted until the Mill is ready for him.

Witness present

Signed Wm. Graham

Signed Lewis Wernwag
John H. Hall.

Deed, John Strider and Others, to the United States, June 27, 1833, 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 wasteways /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 wasteways *[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 $66\frac{1}{4}^{\circ}$ 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 West corner of stone building No. H *[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 Timothy Herrington dead 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 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/

Repairs at the Rifle Factory, 1842-1844:

From 1842 to 1844 Major Craig spent a total of approximately \$ 1,053.41 to make repairs to the Rifle Factory buildings. This included \$ 243.42 for slating; \$ 55.11 for painting; \$ 387.06 for zinc and scrap copper to make gutters and downspouts; and \$ 365.82 to the stone masons to erect dry walls. The rate of expenditures for repairs was as follows:
1842: \$ 670.83; 1843- \$ 350.23 and \$ 32.35 in 1844.

George W. Tracey apparently did the slating on the roofs of the rifle factory shops, receiving \$ 226.66 for 1 this work in 1842 and 16.76 in 1844. John P. Kennedy did glazing and painting and in 1842 received \$ 55.11 for putting 402 panes of glass in rifle factory shops windows and for making 664 panes. 2 John McKineize & Sones provided 1,391 feet zinc in 1842 "for covering rifle factory shops" and also 1,000 pounds of scrap copper at a cost of \$ 387.06. 3

In 1843 the mason Peter Litle was paid a total of \$ 29.61 for building 3 21/25 perches of dry wall for \$ 4.50 and building 41 feet 4 inches of dry wall at a forebay at the rifle factory. 4 The Mason George W. Lynch was paid a total of \$ 320.62 during the period May to August 1, 1843 for work that was perhaps preliminary to the construction of the new filing shop. On May 25 he received \$ 112.50 for excavating 150 cubic yards of rock. 5 On June 17 he was next paid \$ 37.68 for excavating rock and

File 7045, V.42.

1. R.G.217. 2nd Series, March 28, 1842 to George W. Tracey, \$ 88.75 for repairing slate roofs at rifle factory; 2nd Series 7654, V. 69, To George W. Tracey October 1, 1842 for \$ 137.91 for work from April 12 to Sept. 23, 1842, repairing roofs, putting 9 square-60 feet slate stock house roof; putting on 11 square, 82 feet slate, Smiths shop, Rifle Factory. 3rd S., F. 1698, V.17, to George W. Tracey, August 19, 1844, \$ 16.76, for slating rifle factory roof.
2. 2nd Series F. 7045, V.3, To John P. Kennedym January 21, 1842, for \$ 55.11.
3. 2nd Series, F. 7654, V. 44, dated September 26, 1842, for \$ 387.06.
4. 3rd Series, F. 630, November 28, 1843, for \$ 29.43.
5. 3rd S. F.187, V. 109C, May 25, 1843, for \$ 112.50 to George N. Lynch.

6
 building a stone wall." Finally, on August 1, 1843, Lynch received
 \$ 170.44, for "building a wall at the Rifle Factory" which may have been
 part of the stone first story of the filing shop, which the vouchers show
 7
 he was constructing on August 18.

Repair of Old Rifle Factory Buildings, 1845-1851.

During the period 1845-1851 a record total of approximately \$ 93.88
 was spent making repairs to old Hall Rifle Factory shops. (See Following chart).
 Of this total, \$ 4.87 went to the brick mason William Collins; \$ 21.33 to the
 stone mason Edward Tearney; \$ 34.69 to the slater George W. Tracey, and \$ 9.44
 to the plasterer Robert Simms.

6. 3rd Series, F. 187, Voucher 110C, June 17, 1843 for \$ 37.68.
 7. 3rd S., F 440, Aug. 1, 1843, for \$ 170.44.

Expenditures for Repairs at the U.S. Rifle Factory, 1842-44

Year	Slating	Painting	Plastering	Gutters & Spouts	Carpenters	Masons	Total
1842	\$ 226.66	55.11	0	387.06	0	2.00	\$ 670.83
1843	0	0	0	0	0	350.23	350.23
1844	16.76	0	0	0	0	15.59	32.35
Total	\$ 243.42	55.11	0	387.06	0	367.82	1,053.31

(1) Slating: 2nd Series, F. 7045, V. 42, To George W. Tracey for \$ 88.75 on 3/28/42; 2nd S., F. 7654, V. 69- to George W. Tracey for \$ 137.91 on 10/1/42. 3rd S., F. 1698, V. 17, To George W. Tracey for \$ 16.76 on 8/19/44.

(2) Painting: 2nd Series, F. 7045, V. 3, to John P. Kennedy, for \$ 55.11, on 1/21/42.

(30. Gutters and spouting: 2nd Series, F. 7654, V. 44, to John McKineize & Sons, for \$ 387.06 on 9/26/42.

(40 Masons: 2nd Series, F. 7354, V. 20, To Henry Niswanner, for \$ 2.00, 6/10/42, for hauling 2,000 bricks to rifle factory. 3rd Series, F. 630, V. 27, to Peter Little for \$ 29.61 on 11/28/43; George W. Lynch, for \$ 170.44 on 8/1/43, in 3rd S., F. 440, V. 19; 3rd S. 187, Vouch. 109C, To George N. Lynch for \$ 112.50 on 5/25/43; 3rd S., F. 187, V. 110C, To George N. Lynch for \$ 37.68 on 6/17/43. # 3rd S., F. 1698, To Peter Little, Voucher 14, for \$ 13.12 on 8/15/44; 3rd S., F. 1165, V. 42, to Peter Little for \$ 2.47 on 6/14/44.

Bldg '20 REPAIRS AT RIFLE FACTORY, 1845-51

Year:	Bldg. 11	Bldg. 13	Bldg. 18	Bldg. 12	Bldg. 2	Total for Repairs
	Old Annealing Shop	Old Assembly Shop	Old Drilling Shop	Old Turning & Boring Shop	Old Forging & Tempering Shop	
1845						
1846						
1847						
1848						
1849	2.62 (1)	26.59(4)			1.75 (8)	20.96
1850	.50 (2)	24.55 (3)	21.33 (5)	9.44. (8)		44.82
1851			7.10 (6)			7.10
TOTAL	\$ 3.12	24.55	28.43	9.44	1.75	\$ 93.88

1. 3rd S., F. 9895, V. 23, to Brick mason William Collins, August 31, 1849, for \$ 2.62-rebuilding furnace.

2. 3rd S., F. 11000, V. 24, to William Collins, May 15, 1850, \$.50 for repairs of furnace.

3. 3rd S., F. 11542, July 13, 1850, for demolition of structure, \$ 24.55.

4. 3rd S., F. 9307, V. 44, to George W. Tracey, June 23, 1849, for \$ 26.59, removing slate, demolishing shop.

5. 3rd S., F. 12169, V. 43, to stone mason Edward Tearney, 12/20/50-repair of foundations, \$ 21.33.

6. 3rd F. 12680, V. 14, to George W. Tracey, August 16, 1851, \$7.10 for repair of slate roof, 355 feet.

7. 3rd Serial. F. 11,000, May 30, 1850 to Robert Simms, \$ 9.44 for lathing and plastering 104 sq.yards, repair of plaster.

8. 3rd S., F. 10276, V. 33, to William Collins, brick mason, November 29, 1849, for \$ 1.75, repair of tempering furnace.

Demolition of Old Buildings at the
Rifle Factory, 1847 - 1851:

In the period 1846 -1851 Major John Symington designed and erected four major workshops and one minor shop that transformed the old ramshackled

collection of workshops and storehouses at the rifle factory into a modern one. The following 12 old buildings were demolished to clear the sites for

the new (See Map -1848):

2. Forging and Tempering Shop (1837-38)

5. Filers Shop (1837)

6. Barrel Welding Shop (1831).

7. Tilt Hammer Shop (1837-38). January 1851, taken down.

8. Vitriol House (1837) (sold for material, July 13, 1850) (1)

9. Rod Tilting Shop (1831)

11. Assembling and Finishing Shop (1837), sold for materials, July 1850. (2)

13. Bell Shop (1808-09.) Down in June 1849 (3)

15. House for Steaming Stocks.

18. Drill Shop (1836) in 1849.

20. Annealing Shop (1835) in 1851.

21. Annealing Furnace (1835) unusable in 1850. Down in 1851.

1. 3rd S., F. 11542. Sold at public sale of old materials to Dr. Nicholas

Marmion for \$ 3.60 on July 13, 1850.

2. 3rd S. F. 11542, sold to Dr. Nicholas Marmion on July 13, 1850 for \$ 24.55.

3. 3rd S. F9307, V.44, George W. Tracey, June 23, 1849, for removing slate from roof,

MAP NO. 7

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

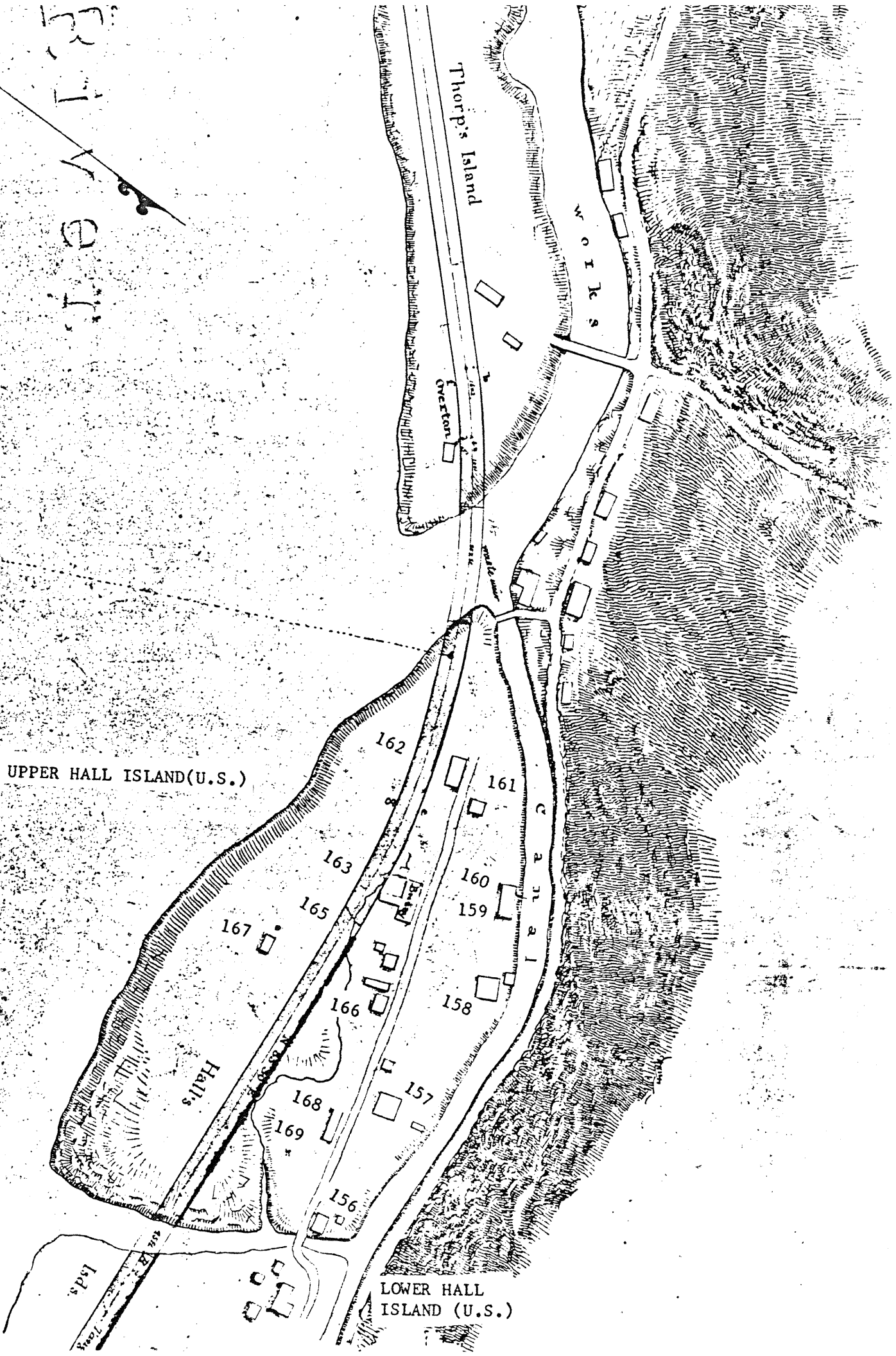
Scale of 100 feet to the inch.

Section of Map No. 1 showing the Upper Hall
Island and Thorp's 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.

SECRET



UPPER HALL ISLAND(U.S.)

LOWER HALL ISLAND (U.S.)

From Harpers Ferry National Historical Park Photostat Material,
Volume I, page 39.

Contract of April 15, 1835, U.S. with Joseph Mullen:

Memorandum of agreement made and entered into this 15th day of April 1835 Between Benjamin Moore acting Superintendent of the United States Armory Harpers ferry, acting with the consent and under the directions of the Hon. Lewis Cass Secretary of War of the one part, and Joseph Mullen bricklayer, of the other part, Witnesseth:

1st That the said Joseph Mullen hereby covenants and agrees to put up two certain buildings called annealing houses at the Rifle Works, Harpers Ferry Armory. He the said Joseph Mullen finding all the materials and labour required in the mason work thereof, and for which work so done by the said Joseph Mullen the said Benjamin Moore, acting Superintendent as aforesaid agrees to pay him the following prices, viz:

For the Brick work per every thousand of brick, nine dollars, & for the stone work - 1.50 per perch - For the Brick cornice per foot twelve and a half cents - Single arches per each Fifty cents - double arches for each one dollar & seventy five cents.

And the said Mullen binds himself to execute the mason work of said annealing shops in a workmanlike manner.

It is hereby lastly understood that no Member of Congress shall in any manner participate in the advantage of the above contract, nor shall receive either directly or indirectly any profit arising therefrom.

In testimony whereof the parties have hereunto set their hands and seals the day and year first written.

(signed) Benjm. Moor (Seal)
Actg. Superintendent

Joseph Mullen (Seal)

Approved

Oct. 19 1835 (signed) Geo. Bomford Major 1. of Ordnance

R G 156 O C O

CONTRACT BOOK NO. 13, p. 231

During this period a limited number of artisans executed most of the construction and repair work for the Armory. This group included the following chief workmen:

Trade	Name	Years Active	Value of Work
Carpenters	Bateman, William	1823-1826	\$ 862.20
"	<u>Curry, Joseph</u>	1828-29	\$ 1,083.85
"	Downey, Joel	1824 -25	\$ 912.35
"	<u>Foley, Michael</u>	1827-28	<u>442.25</u>
"	<u>Fouke, Charles</u>	1817-1826	\$ 3,946.71
"	Hill, Jacob	1823- 1828	381.59
"	Krby, William	1818-22	350.47
"	<u>Markell, John</u>	1824-1829	\$ 1,468.12
"	<u>O'Neal, Francis</u>	1825- 1829	\$ 1,124.77
Masons	Bond, George W.,	1829	681.75
"	Cook, Michael	1827-32	377.37
"	<u>Coons, Philip</u>	1826-29	1,276.18
"	Cotter, Martin	1824-33	493.78
"	Garrett, Johnson	1829	375.00
"	Gust, John	1824-29	1,160.96
"	<u>Harding, Edward</u>	1817-1829	<u>6,429.19</u>
"	<u>James, Henry</u>	1818 - 21	1,618.08
"	<u>Johnson. John</u>	1828 -29	1,713.48

Trade	Name	Years Active	Value of Work
Masons	Lackey, John	1823- 1830	\$ 838.71
"	Landragen, Patrick	1825- 29	628.40
"	McKinny, William	1817 - 29	937.33
"	McNulty, James	1821-29	\$ 4,050.64
"	Randall, George	1827	307.18
"	Spencer, Joseph	1826-29	4,117.75
"	Strider, Philip	1823- 27	1,032.63
"	Tompkins, Jonah N.	1817 -24	817.68
"	Walsh , Michael	1823-28	1,816.96
"	Wernwag, Lewis	1825-29	2,155.82
Millwright-	Lowstetter, John	1820-25	6,819.86
"	Painter, Robert	1819-20	1,060.15
Painters	Bowin, William	1824-29	1,085.29
"	Carty, Daniel H.	1820	274.75
"	Hay, Henter	1825-29	353.15
"	Sadler, Leonard	1817-21	463.97
"	Thomas, Jacob R.	1822-24	397.18
Plasters	Bennett, John A.	1820-21	264.77
"	Bulter, William	1823-25	568.88
"	Dill, Abram	1817-18	162.62
"	Gallaher	1825-29	921.75
Slaters	Bayley. William	1827-29	380.10
"	Preston, Anthony	1825-26	2,323.42
"	Steele, James	1828	Records incomplete

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APPENDIX NO. 9

Builders who erected the Buildings, Canals, and
Dams of the U.S. Armory at Harper's Ferry, Virginia
from 1830 to 1841

Based on data in the vouchers of the Harper's Ferry
Armory Paymaster in the Records of the 2nd Auditor of the
U.S. Treasury, 1st and 2nd Series, National Archives
Record Group No. 217, Washington, D.C.

Trade & Name	Years Active	Remarks	Amount Paid
<u>ARCHITECTS</u>			
1. Mills, Robert	1840	Plan for vault, Pay Office	\$ 10.00
<u>ENGINEERS</u>			
1. Cruger, Alfred	1833	Plan and supervision of the extension of the U.S. Potomac Dam.	\$ 300.00
<u>CANALS / (Misc.)</u>			
1. Byrne, Patrick	1835	Renting horses & carts for work on the canal	61.25
2. Cook, Michael	1831-32	Walls and embankments at Rifle Factory, Hall's Island	137.33
3. McCartney, John	1841	Excavation on Potomac Canal	100.00
4. Morgan, Edward	1839	filling up old saw mill site on Potomac Canal.	11.00
5. Rice, Patrick	1835	Carts and horse for work on Rife Factory Canal.	17.43
6. Storm, Anthony	1837-38	erecting flood walls at Rife Factory, grading yards	823.00
Subtotal Canals, Misc.			\$ 1,150.01
<u>CARPENTERS</u>			
1. Compton, Samuel	1837		28.00
2. Delgarn, John	1837	building a house	300.00
3. Foley, James- Master Carpenter	1831-38	1831 - 65.00 1832 45.10 1833 540.00 4 houses & 1834 1,567.07 work shops 1835 517.80 1836 120.92 1837 5,358.87 11 houses 1838 1,971.28 10,156.04	10,156.04
4. Foley, Michael	1830, 1839-40	1830- \$ 700.00- one house 1839-40 332.03- porches, etc.	1,032.03
5. Friend, Jacob	1837	work on dwellin house	208.77

Trade & Name	Years Active	Remarks	Amount Paid
<u>CARPENTERS(Continued)</u>			
6. Hyatt, John	1837-41	1837- 342.83 dwelling hs. 1838- 127.25 workshop 1839 211.60 Pay Office 1841 96.87	\$ 778.55
7. Lasham. Daniel	1837	dwelling houses	203.68
8. Mathias, Daniel master carpenter	1833 -35	1833 - 1,080.00 4 houses 1834 1,080.00 1834 271.18 workshop 1835 270.65 workshop	2,701.83
9. Schofield, Jessie	1838		91.50
Subtotal-Carpenters			\$ 15,500.40
<u>MASONS</u>			
1. Barry, James	1837		27.74
2. Bastable, James	1830		12.75
3. Bau(?), George	1837		137.12
4. Cliver, John M.	1837	Stone foundations for 2 work-shops at Rifle Factory	421.80
5. Colbit, Long	1837	Providing 42½ perches of stone	31.87
6. Cotter, Martin	1833	Providing 284 perches of stone	142.00
7. Cullen, Andrew	1840		17.50
8. Garrett, Johnson- Master Mason	1829-36, 1839	1829- 375.00 enlarging 1830- 5,500.00 Musket Factory 1831 - 3,200.00 Canal 1832- 250.00 (\$ 9,325.00) 1833 7,545.00 1834 11,418.13 Work on canal 1835 968.28 work on shops 1836 3,487.46 work on shops. 1839 49.50-providing stone	32,743.87
9. Grubb, John	1834-35	work on workshops	654.05
10. Gust, John- Master mason	1830-31	6,569.87 for enlarging canal 590.49 for foundations of grinding mill at Musket Fact.	7,160.36

Trade & Name	Years Active	Remarks	Amount Paid
<u>MASONS(Continued)</u>			
11. Hanson, George W.	1831		144.88
12. Hillard(or Hilliard) Joseph- Master mason	1833-34	1833-34- stone & brick work on eight houses: 1837- stone and brick work on 7 houses	3,516.96 3,725.00 \$ 7,241.96
13. Kirwan, Thomas	1839	working on building Potomac River wall at \$ 2.00 per day.	
14. Lackey, John	1830		10.00
15. Lambaugh, John	1837-38	1837- \$ 1,222.28-2 brick hses. 1838 684.52 1 brick hses. 1841 68.00	1,974.80
16. Ledwick, Michael	1830	Provided 40 perches of stone	31.50
17. Lester, William	1841	provided 20 perches of stone	14.50
18. Litle, Peter	1839	working at \$ 2.00 per day building Potomac River wall For work on Bell Shop, 1839	44.62
19. Littlejohn, John- Master mason died in 1838-or 39.	1837-39	1837- \$ 13,972.26 for building 1838- 8,742.75 about 2/3rds 1839 1,710.00 Potomac River Wall at Musket Factory	25,130.67
20. Lowing(or Lowrie, David	1837	providing 308 perches of stone	197.68
21. Lucas, Edward, Jr.	1837	for additions to Clerk's house	235.84
22. McClure, John	1837	Rifle Factory shop	170.41
23. McElwee, John	1837	Work on Rifle Factory shop	11.58
24. Markell, John	1831-32	building 5 brick houses	4,700.00
25. Mattlingly, George	1841	foundations of new warehouse at Musket Factory & river wall	2,199.02
26. Mullen, Josiah	1834-35	1834- 509.80 erecting shops 1835 2,170.28	2,680.08
27. Mullen and Spencer	1833		382.52

Trade & Name	Years Active	Remarks	Amount Paid
<u>MASONS(Continued)</u>			
28. Picking, Jacob	1837		\$ 670.09
29. Russell and Byrne	1839	Providing cut stone for fore-bay.	226.26
30. Spencer, Joseph	1836 -40	1836- 404.54- shops at R.F. 1837- 1,132.28-shops at R.F. 1838 96.30 1840 81.81	1,714.93
31. Tearney, Edward	1839	working at \$ 2.00 per day on Potomac River Wall.	
32 Thompson. Joseph T.	1834-35		588.13
33. Wernwag, Lewis Master mason and dam builder	1830-38	1830- 200.00 for a stone house 1831- 147.75 1832 178.00- wall at rifle factory 1833- 3,174.55 for repair & extension of Potomac Dam 1833-34-\$ 2,713.06 for work on 3 Musket Factory shops. 1834-\$ 1,999.50 for building U.S. Shenandoah Dam. 1835 - \$ 109.76 1837- 954.97- tail race at R.F. 1838- 159.77 for lumber	9,636.36
Subtotal- Masons			99,354.89
<u>MILLWRIGHTS</u> (sample only of their work)			
1. Apsey, Jacob	1835-37	1835- 329.35 including making 1 wooden water wheel for 120.00 1836- 320.00 1837- 1,521.63	2,170.98
2. Starbuck, Charles C.	1833-37 1835-36	1833- 292.66 for new water wheel 1835-36- 1,240.00 for 4 cast iron water wheels. 1836-37- 1,550.00 for 5 new cast iron water wheels	3,082.66
3. Price, John	---1838		24.37
Subtotal Millwrights			5,278.01

Trade & Name	Years Active	Remarks	Amount Paid
<u>PAINTERS</u> (Samples only)			
1. Bordin, William	1838	Painting and glazing	205.11
2. Bowin William	1830		21.83
3. Brown, William	1835		244.09
4. Butler, George	1837		5.00
5. Kennedy, John P.	1834-41	Armory painter during this period	212.04
Subtotal , Painters			\$ 688.07
<u>PLASTERERS</u> (Sample only)			
1. Brown, Leo W.	1834	Armory plasterer during most of this period	43.70
2. Fawcett, William	1837		138.50
3. Gallaher, James	1830		6.00
4. Gallaher, Sidney S.	1837		29.89
5. Harris, Jermiah(or Jerry)	1834-41		225.30
6. McKenzie, Hiram	1841		249.85
7. Starrett, John	1841		238.31
Subtotal- Plasterers			931.55
<u>SLATERS</u>			
1. Bayley, William	1831-41	1831- 308.71 1832- 414.96 1835- 718.64 1836 1837 - 746.06 1838 950.32 1839 316.42 1840 1841 451.86	3,906.97
2. Tacey(Tracey), George W,	1840-41	1840- 185.07 1841 11.81	196.88
Subtotal- Slaterers			4,103.85

Trade & Name		Years Active	Remarks	Amount Paid
<u>PAVING STREETS IN HARPER'S FERRY</u>				
1. Byrne and Shields		1839	Paving Potomac Street	\$ 37 73.12
2. MacDonald, William		1834	Paving Shenandoah Street	2,678.79
Subtotal- Paving Streets				2,751.91
<u>PUMP MAKER (Sample only)</u>				
1. Bragg, Charles G.		1837	For making five pumps with a total length of 222 feet	222.00
<u>TIN OR METAL SMITHS</u>				
1. Rawlings, Francis		1838		76.66
2. Snook, Benjamin		1837-41	1837- 318.07 1839 140.70 1841 114.46	573.23
3. Yost, Henry and Frederick		1833		54.49
Subtotal, Tinsmiths				704.38
<u>GRAND TOTAL</u>		1830-41	73 men	\$ 130,995.07
<u>Trades</u>	<u>No. of</u>	<u>Paid</u>		
Architects -	1	\$ 10.00		
Engineers	1	300.00		
Canal(Misc)	6	1,150.01		
Carpenters	9	15,500.40		
Masons	33	99,354.89		
Millwrights	3	5,278.01	(Sample)	
Painters	5	688.07	(Sample of salaries)	
Plasterers	7	931.55	(" " ")	
Slaters	2	4,103.85		
Street Pavers	2	2,751.91		
Pump Maker	1	222.00	(Sample only)	
Tin Smiths	3	704.38	(" ")	
Total, 1830-41	73	130,995.07		

April 28, 1981

Paul

Memorandum

To: Superintendent Don Campbell, Harpers Ferry NHP
From: Historian Charles W. Snell, National Capital Team, DSC
(Room 4314, 1100 L. Street, NW)

RECEIVED
APR 29 8 19 AM '81
HARPER'S FERRY, WV.

Subject: Draft of History of Lower Hall Island, 1751 - 1841.

Enclosed is a copy of the final draft of the research report
"History of the Lower Hall Island and Of Captain John H. Hall's
Rifle Factory, 1751 to 1841, A Physical History, Vol. I.,
Harpers Ferry National Historical Park, West Virginia," (April 1981),
125 pages, seven maps and no illustrations.

Charles W. Snell

Charles W. Snell
Historian