

Fort McHenry Powder Magazine
Fort McHenry National Monument
and Historic Shrine
Whetstone Point
Baltimore
Baltimore County
Maryland

HABS No. MD-197

HABS
MD
4-EALT
5B-

PHOTOGRAPHS
WRITTEN HISTORICAL AND DESCRIPTIVE DATA
REDUCED COPIES OF MEASURED DRAWINGS

Historic American Buildings Survey
National Park Service
Eastern Office, Design and Construction
143 South Third Street
Philadelphia, Pennsylvania

HISTORIC AMERICAN BUILDINGS SURVEY

HABS No. MD-197

FORT McHENRY POWDER MAGAZINE

HABS
MD
4-BALT
5B-

Location: Fort McHenry National Monument and Historic Shrine, Whetstone Point, Baltimore, Baltimore County, Maryland.

Present Owner: Owned by the Nation, custody of the National Park Service.

Present Use: Part of a maintained group of historic structures.

Brief Statement of Significance: This structure, built about 1800, in its original form played an important part in the bombardment of Fort McHenry, September 13-14, 1814.

Historical and Architectural Information: The following historical and architectural account has been extracted from An Architectural Study of Fort McHenry by Lee H. Nelson, National Park Service Architect. It was compiled for the Historic American Buildings Survey in connection with restoration work carried on at the Fort McHenry National Monument and Historic Shrine. Fifty copies were published in January 1961 and distributed to a limited number of libraries.

CHAPTER III. THE POWDER MAGAZINEPART A. Historical InformationHABS
MD
4-BALT
5B-

The powder magazine is one of the buildings within Fort McHenry, built 1799-1800, from a plan by John (or Jean) Foncin, French artilleryist and military engineer. The first graphic document that in any way indicates a magazine inside the fort is a plan of November 9, 1803.¹ This plan, curious in several respects, is drawn to a scale of toises, a French measure, in this case equivalent to six feet. At any rate, a magazine was shown and it occupied its present position. It was a rectangular structure, drawn only in outline, and (by converting toises to feet) measured 20'-0" by 31'-6". There is no interior arrangement shown. This is the earliest measurable plan of that building and is corroborated by a similar plan of the fort which was drawn ca. 1806, by Captain John B. Walbach of the Artillery for the U. S. Military Philosophical Society.² This plan is also drawn to a scale of toises, and the magazine similarly scales about 20'-0" by 31'-6". The ca. 1806 plan shows a wall around the magazine, which might have served either as a low retaining wall to provide better drainage, or more likely, as a means of isolating the magazine from the garrison, a common military device. Excavation of

¹"Fort McHenry, 9th November, 1803" [H.A.R.P. map no. 1], National Archives, Cartographic Section, Record Group 77, drawer 51, sheet 1. Original authorship of this plan is unknown. It was later endorsed by Capt. Richard Delafield, Engineers, and Gen. Charles Cratitot, Chief Engineer of the Army, September 27, 1836.

The writer acknowledges the assistance extended by Dr. S. Sydney Bradford and Franklin R. Mullaly, National Park Service Historians, during the architectural evaluation of the historical documents, which they collected and arranged for the Fort McHenry research library.

²"Plan of Fort McHenry by Captain Walbach of the Artillery for the U.S. Mil: Philo: Soc: No. 1" [H.A.R.P. map no. 2], ca. 1806, New York Historical Society, United States Military Philosophical Papers. See H.A.R.P. index card for reference to documents that establish the approximate date of this map.

the magazine foundations during the 1953 archeological program has revealed the original building size to be 20'-0" by 31'-6", and thus confirms the accuracy of the 1803 and 1806 plans. The existence of the powder house was first officially recognized in a report of the Secretary of War, dated February 13, 1806.³ Not until 1809 is there a document which refers to the structure as a brick magazine.⁴ Finally in 1811, a War Department report on coastal defenses, describes Fort McHenry in more precise terms, noting that there was a "...Brick Magazine that will contain 300 Barrels of Powder..."⁵

With the mounting tension between England and America, the necessity of improving fortifications commanded considerable attention. By 1811, repairs were necessary at Fort McHenry; and the buildings were generally refurbished. By spring of 1813, the tempo of improvements had increased. General Samuel Smith, Maryland Militia, in March 1813, asked the Secretary of War for "...An Engineer to compleat [sic] the fortifications..."⁶ As a result, on March 27, 1813, J. G. Swift, Colonel of the U. S. Engineers directed Major Lloyd Beall (U.S. Artillery, at Fort McHenry, March and April 1813) to carry out certain improvements at Fort McHenry.

³Report of the Secretary of War, February 13, 1806, U. S. Congress, American State Papers, Documents, Legislative and Executive of the Congress of the United States, 1832 [XVI], 194. Cited hereafter as American State Papers, XVI.

⁴Report of the Secretary of War, December 19, 1809, American State Papers, XVI, 246.

⁵Report of the Secretary of War, December 10, 1811, American State Papers, XVI, 310.

⁶Sam. Smith to Gen. John Armstrong, Sec. of War; March 16, 18, 1813. Library of Congress, Manuscript Division, Samuel Smith Papers. Cited hereafter as S. Smith Papers.

Among other things he was ordered to:

Erect a Traverse inside the Fort...of Brick...in front of the Magazine Door, 12 feet long & 8 feet thick at the Base, sloping two inches to each foot in height...as high as the top of the window over the Door.⁷

However, nothing was done immediately. Smith again asked for an Engineer. A month later Colonel Swift ordered Captain Babcock to erect the traverse which had not yet been built.⁸ Another month passed and the order was repeated. In spite of the urgent need for improving the magazine, there is no evidence that the work was executed until after the bombardment.

The vulnerability of the structure was dramatically emphasized during the bombardment September 13-14, 1814:

While men were outside [the] star fort...a shell struck the powder magazine where there were many barrels of this explosive. When the shell struck it was deemed necessary to roll out the barrels of powder as the magazine was not bomb-proof.⁹

Another account relates that, "A shell struck the corner of the

⁷Col. Swift to Maj. Beall; March 27, 1813. U. S. Military Academy, J. G. Swift Papers. A traverse for a magazine of this period, is a block of brick masonry placed in front of the magazine door. Its function was to protect the entrance from cannonfire. Such a traverse was usually incorporated into the fabric of the building above the door level, and contained a separate entrance or entrances, leading into the powder storage room. While the traverse served as a protective device, it had the disadvantage of blocking light from the interior. Typical extant examples are the traverses at Fort Washington, Maryland, built 1815-24.

⁸Col. Swift to Capt. Babcock; April 26, 1813. National Archives, Record Group 77, War Department, Office of the Chief of Engineers, Buell's Collection, Engineer Historical Papers, 1800-1819.

⁹Baroway, Aaron, "The Cohens of Maryland," Maryland Historical Magazine, XVIII (1923), 373 "Reminiscences of the Bombardment of Fort McHenry, 'The Star Fort,' in Sept., 1814." Narrated by Col. M. I. Cohen.

magazine in a slanting direction, and shattered the wall; had it penetrated, the capture of the fort would have been inevitable."¹⁰

The fact that there were no bomb-proof buildings within Fort McHenry and the apprehension that the British would shortly return, prompted immediate efforts to put the fort in a better defensive condition. Within four days after the attack, Brig. General Winder directed Major General Samuel Smith's attention to the work as follows:

There will be required to render the magazine [at Fort McHenry] bombproof, [with] 192000 Bricks & 40 Brick layers [thick].¹¹

From the above quantity of brick,¹² and from the existing architectural evidence, it appears that "to render the magazine bombproof," three improvements were made immediately after the attack of September 13-14, 1814. 1) The walls of the magazine were thickened to their present dimensions; 2) a massive brick vault was built over the powder storage room, and; 3) a traverse was erected in front of the newly thickened walls, thus protecting the entrance.

The foundation of the traverse, as excavated during the 1958 archeological work, agrees quite closely with 1813 directive; that is, the traverse is 12'-2" long and nearly eight feet wide (the full width being disturbed by a later utility line). However, the location

¹⁰Duncan, John M., Travels Through Part of the United States and Canada in 1818 and 1819 (New York: 1823), v. 1, Letter VIII, 225-26.

¹¹Gen. Winder to Gen. S. Smith; September 18, 1814. Baltimore City Archives, Baltimore City Hall, 1814, Box 23, no. 496.

¹²The writer has calculated that approximately 90,000 of the bricks were used in the construction of the "bombproof" vault, with the balance being employed in the thickening of the walls, etc. The term "40 brick layers" refers to the vault. 40 layers of brick at 2 1/4" per brick gives a vault thickness of 7'-6". The actual thickness varies from 7'-0" to 7'-4", remarkably close to Gen. Winder's order.

of the traverse, together with visible evidence in the brick masonry, tend to support the writer's opinion that the traverse was added to the newly thickened front walls after the bombardment, rather than to the smaller pre-bombardment magazine.

The haste with which the magazine was strengthened is impressive. By September 29, 1814, two weeks after the bombardment, Samuel Smith reported that "The Bombproof for the magazine at Fort McHenry will be compleat [sic] this day."¹³

While the powder house was now adequate from a military point of view, it still lacked a roof to protect the exposed brick vault from the elements. With respect to this problem, some of the post-attack improvements at Fort McHenry were carried out from plans by Maximilian Godefroy, Baltimore architect and professor of civil and military architecture at St. Mary's College. Shortly after completion of the magazine vault, Godefroy intended to cover the vault with earth and sod roof. The earth was intended to act both as a roof and as further protection against concussion. Godefroy's scheme, however, met considerable opposition from Captain Frederick Evans, Commanding Officer of regular artillery at Fort McHenry. Evans feared that an earthen roof would prevent the freshly-laid masonry from curing, as follows:

Should [covering the magazine with earth] take place, I believe it will not be possible to save our powder, as the arch when put up was done in a rainy time & the absorbent qualities of the brick destroyed...[It] now requires all the air that can be had both within & without to dry the walls.¹⁴

¹³S. Smith to James Monroe, Sec. of War; September 29, 1814. S. Smith Papers.

¹⁴Capt. Evans to Gen. S. Smith; October 9, 1814. S. Smith Papers.

Apparently the matter was settled by merely plastering the vault,¹⁵ but the problem was not resolved. The following year, in November 1815, an estimate for rafters, plank, nails and shingles, totaling \$592.60, was transmitted to Lt. Colonel Bomford with the statement that construction of a roof should be expedited due to the impossibility of keeping ammunition dry during the winter, and that "Slates tho' preferable to shingles are not to be procured."¹⁶ Apparently the slates were located however, since the appropriation was increased to allow for installation of a slate roof instead of shingles, and the repair work included several lightning rods.¹⁷

The first professionally competent plan of Fort McHenry is that done in 1819 by William Tell Poussin, Captain of the Topographical Engineers. This plan shows the fort in its improved post-war condition, is accurately drawn and includes some rather significant details and sections.¹⁸ The powder magazine, as shown on this plan, had reached

¹⁵The heavy coat of plaster is still intact on the upper surface of the brick vault, although there is no documentary evidence as to the date of its application.

¹⁶Lt. Bache to Lt. Col. Bomford; November 24, 1815. National Archives, Records of the War Department, [Record Group 156], Office of the Chief of Ordnance, Selected Letters Received 1801, 1806 and 1812-20. Cited hereafter as NA RWD RG156 OCO SLR 1801-20.

¹⁷Lt. Baden to Capt. Morton; November 4, 1817. NA RWD RG156 OCO SLR 1801-20.

¹⁸"Reconnoitring of Chesapeake Bay, STATE OF MARYLAND, Plan and Profiles of Fort McHenry, 1819." Drawn by William Tell Poussin, Captain Topographical Engineers, H.A.R.P., Map no. 4. National Archives, Cartographic Section, Washington, Drawer 51, Sheet 2.

its present physical size. Most helpful is the fact that the traverse is also shown projecting from the front end of the structure. So accurately is the magazine drawn that it agrees in dimensions with the present measured building.

Although the magazine at this time was protected by a brick traverse, a "bombproof" brick vault, and a slate roof to shed rain, apparently it fell into disuse after the cessation of hostilities. An inspection report of 1822 notes that the "Magazine contains only boxes of fixed ammunition and Cartridges."¹⁹

During an active renovation period of Fort McHenry in 1829, the magazine underwent some changes. Captain J. W. Ripley, in charge of repairs, reported to General Gratiot, Chief Engineer of the Army, as follows:

The Magazine (within the Fort) is entirely useless as such, having two others that are perfectly dry, and in good repair. I request permission to remove a small Traverse from the door...in order to admit the light, as I wish to occupy it as an office or Store Room. The T[raverse] is quite small, but so situated as to exclude the light from the door and a window once in use if necessary could be readily replaced.²⁰

Permission for this change was granted two days later by Gratiot, on July 27, 1829. The traverse of course was not as small as Ripley represented it to be. It was a block of brick masonry 12 feet wide, 8 feet deep and 18 feet high. Though the traverse was removed, its location was determined in the 1958 Archeological program. The

¹⁹Unsigned Inspection Report, dated September 22, 1822. National Archives, Record Group 159, Office of the Inspector General, Selected Pages from Inspection Reports 1814-1842.

²⁰Capt. Ripley to Gen. Gratiot; July 25, 1829. National Archives, [Record Group 107], Office of the Chief of Engineers, Selected Correspondence Relating to Fort McHenry, Maryland, 1811-1837. Cited hereafter as NA RG107 OCE SC FT-MC 1811-37.

existence of the traverse was short-lived, only 15 years, but that was sufficient time to indicate its outline on the frontwall of the magazine, due to the lime action in the brickwork around the traverse.²¹

When Maj. General Gratiot inspected the fort in 1835, the magazine was still not a fit receptacle for powder. He noted:

as the present magazine is too damp for the preservation of powder, as well as unsafe from its projecting several feet above the ramparts, a new one is required.²²

During the last half of the 1830's, considerable repair of the fort was carried out under the direction of H. A. Thompson, nephew of Gen. Gratiot. Thompson seems to have had a free hand in determining the extent and execution of this work.

Among the many repairs and additions made by Captain Thompson was a new floor in the magazine, as well as a lining to the interior walls.²³ The main concern was to once again make the magazine dry enough to store powder, and put an end to the irritating problem of continual dampness. Thompson's proposed changes were approved by Gratiot January 8, 1836. From the excavations conducted under the magazine floor during the 1958 Historical and Archeological Research Program (MISSION 66), it would appear that the magazine had a cellar space for circulation of air under a wooden floor. The interior side

²¹See photograph by L. M. Leisenring, O.Q.M.G. Photo of powder magazine and building A, taken February 2, 1927, H.A.R.P. Photo no. 1358.

²²Gen. Gratiot to Sec. of War, November 20, 1835. National Archives, Record Group 77, War Department, Office of the Chief of Engineers, Letters Received 1826-1837. Cited hereafter as NA RWD RG77 OCE LR 1826-37.

²³Capt. Thompson to Gen. Gratiot, January 9, 1836. NA RWD RG77 OCE LR 1826-37.

foundation walls have a ledge suitable for accommodating wooden joists and floor planking. These interior footings extend below the ledge for a distance of 5'-8", more than ample for ventilation, but also so deep as to be constantly damp due to ground water. A similar floor construction was used in the powder magazines at Fort Washington, Maryland, constructed 1815-1824. In fact, all the remaining service magazines outside the walls of Fort McHenry have wooden floors over a cellar space.

Apparently Thompson filled the magazine cellar with earth, and laid a brick floor over the fill, just as he had filled the cellars of the barracks to eliminate decaying of joists and flooring due to ground water. The barracks cellars were filled about the same time (1836-37).

Special order No. 70 was issued on August 29, 1836, which caused the evacuation of troops so as to continue repairs on a larger scale. Not only were buildings repaired during the period 1836-1840, but outer works, a seawall, boundary wall, etc., were constructed. During this interval, Captain Thompson was agent for the Engineer Department, and among his frequent transmittals is a report which includes the condition of the magazine.

The magazine is large, in good order, drier than those I have generally seen, & has a lightning rod, the only one at the Fort. [The magazine] requires a protection in front of the door...²⁴

The "protection" to which Thompson alludes, is a traverse to replace the one which had been removed in 1829. Nothing was done however about rebuilding the traverse.

²⁴Capt. Thompson to Capt. Smith, March 21, 1839. NA RWD RG77
OCE LR 1838-66.

The magazine was the subject of further interest, however. On June 24, 1839, Thompson sent a plan and section of the magazine to Captain F. A. Smith, Engineer Department. The letter which accompanies the drawings describes the building as follows:

The Building is of Brick, with a Slate Roof & a lightning Rod...there is no cellar or space under the floor...there is but one Ventilator or window in the rear...two doors which are good & strong... a new window shutter will be required...it appears to me that the roof might be lowered considerably, & thus prevent its being so conspicuous an object...²⁵

The "window" was in the rear wall and has since been bricked up. While Thompson's plan was generally correct, some details were based upon assumption rather than fact. This is especially true of the vent holes and roof structure.

Apparently he was aware of the shortcomings of his drawings, and in a follow-up letter admits to errors. In an effort to determine the extent of the space under the roof, Thompson sent a "small man" into the space, but it was too "dark and gloomy" to learn anything, and he finally concluded that it "...can only be seen with the roof off..."²⁶

The purpose of Thompson's effort was to determine if the roof structure could be lowered. That the roof projected above the ramparts had been noticed by others. In 1836 Colonel Fenwick had brought the matter to the attention of General Gratiot:

...may I not observe that from its height, it presents too conspicuous an object to the Enemy for a direction of its Fire?²⁷

²⁵Ibid., June 24, 1839.

²⁶Ibid., June 27, 1839.

²⁷Col. Fenwick to Gen. Gratiot, January 9, 1836. NA RG107
OGE SG FT-MG 1811-37.

However, the matter, though revived occasionally, was dropped, and the roof remained unchanged.

On October 22, 1839, Captain Thompson was ordered to repair the rear window of the magazine with a shutter on the outside and a row of 7/8 inch diameter iron bars, set in the opening one foot inside the walls, with a "wire gauze" screen installed on the inside.²⁸

With repairs at the fort substantially complete, the garrison was turned back to the artillery as per Special Orders No. 94, December 4, 1839.

While other minor repairs have been made at various times, such as bricking up the rear window, reworking the doors, and raising the ground level to provide better drainage, the powder magazine has not undergone any significant changes. It was used as a coal shed in the 1880's, and generally has never been entirely useful or satisfactory as to its original function. It was never adequate as to size, nor was it conveniently located with respect to the guns in the fort. Altogether, the magazine never served its function efficiently, and ultimately it was discovered that to render the outer batteries effective, several service magazines, contiguous with the battery, were a more satisfactory solution.

²⁸"An Account of such Repairs to Fort McHenry as appear on the books of the Engineer Department," by Capt. Frederick A. Smith, May 5, 1840. NA RWD RG77 OCE LR 1836-66.

PART B. Architectural Information

A. General Statement. This powder magazine represents two stages of construction. As originally built, ca. 1800, it was the main powder storage facility for Fort McHenry, and as such played an important role in the defence of the fort during the British bombardment of September 13-14, 1814. It is said to have sustained a direct hit during that engagement, and its present appearance is primarily a product of extensive alterations following that military action.

1. Architectural Character. Architecturally, the powder magazine is similar to other magazines of the late 18th and early 19th century, and should be compared with the brick arsenal at Fort Mifflin, Pennsylvania, built 1798-1800 and the two magazines at Fort Washington, Maryland, built 1815-24. The massive, block-like appearance expresses its function as a protective enclosure for powder storage. The lack of fenestration, the narrow doorway, and the unusually thick brick walls adjacent to the entrance, contribute to the severely plain architectural character. Exterior architectural detail is limited to the eight-sided, gambrel-type roof and the corbeled brick cornice along the sides. The original design of this powder magazine is unknown, since in 1814 it was completely enveloped by five feet of brick walls, and the roof replaced with a brick barrel vault. Originally, it was a rectangular structure of brick, 20' by 31'-6" in size. The interior powder chamber is little changed and measures 10' by 26'. The side walls were originally five feet thick, while the front and rear walls were originally three feet thick. The original door opening still exists, but a window over the door which once daylighted the interior has been bricked up. The magazine once had a wooden floor, supported by joists over a cellar space. The cellar has since been filled with earth, and the wooden floor replaced with brick paving.

2. Condition of Fabric. Very good.

B. Exterior.

1. Overall dimensions. 30'-5" by 40'-2".

2. Foundations. The sidewall foundations of the original magazine are of random sized quarry stone, about 5'-4" thick, and extend below the joist ledge line to a depth of 5'-8". When the brick walls were thickened around the exterior of the building (in September, 1814), the additional required footings were constructed of brick and extend below grade about four feet.

3. Wall Construction. Brick throughout; the side walls are now 10'-3" thick, front wall 8'-3" thick, and rear wall 6'-1" thick. Brick is laid up in common bond with headers inserted at irregular spacing, varying from two to eight courses. A portion of the original front wall is visible above the doorway and brickwork in that area is laid in English bond.

4. Openings.

a. Doorways and Doors. This structure is typical of other early nineteenth century powder magazines in that it is equipped with inner and outer wooden doors. The door opening penetrates the original front wall which is three feet thick, and the doors are flush mounted on the inner and outer surfaces of that opening. The outer door, of 2" stock, is supported by wrought iron strap hinges. The infilled panels are composed of beaded boards. The inner door is 2" thick, is supported with iron strap hinges which embrace both sides of the door. The inner door is more like a cell-door. It has four rectangular openings with iron bars. This door is similar to those in the powder magazines at Fort Washington, Maryland. These doors probably date from the mid-1830's.

b. Windows and vent holes. Originally, the magazine contained two windows, one over the door and one in the rear wall. The front window was bricked up at an early date when the outer walls were thickened, but the rear window opening served at least until the late 1830's when it was fitted with iron bars and a "wire gauze" screen. At some undetermined time after that, the rear opening was reduced in size to a rectangular vent slot.

There are also small vent holes along the exterior walls, but the ultimate destination of these holes is not known because they change direction inside the wall and the inner surface of the powder storage room is plastered over their original inlet.

5. Roof.

a. Shape, covering. The inner storage chamber is covered with a brick "bomb-proof" barrel vault approximately seven feet thick which is plastered on both surfaces. Above this is a wooden superstructure or outer roof which carries a slate roof. This superstructure follows the general semi-circular shape of the vaulting, but is composed of eight straight-line segments. Posts, which rest on the upper surface of vault, carry the roof beams. The beams are decked, with one inch boarding or subroof to which is attached the slating.

b. Cornice and fascia. There is no cornice as such, except a corbelling of brick along the sides of the magazine, which supports the lower roof supporting beams. A 1" x 8" beaded fascia board on the front and rear walls, follows the broken roofline and serves to flash the joint between the brick walls and slate roof.

C. Interiors.

1. Floor Plan. There is only one interior room which measures 9'-11" by 26'-0".

2. Flooring. Brick, two layers thick, laid in mortar without any consistent pattern, except for cross bands of brick laid end to end, on approximately two foot centers. The original surface was probably of wooden floor boarding supported by floor joists which rested upon the stone foundation ledge. There was probably a shallow cellar space for circulation of air, but that was filled about 1837.

3. Wall and Ceiling finish. Plaster, probably modern.

D. Site. Behind the magazine is a granite and brick revetment wall spaced two feet from the rear magazine wall, and which serves to separate the sodded earth terreplein from the magazine and thus keeps it dry.

The ground surface all around the magazine is paved with brick laid in a herringbone pattern. Adjacent to the northeast side wall of the magazine is a group of unmounted cannon lying upon the brick paving.