
The Hugh Mercer Apothecary

*Fredericksburg, Virginia
Historic Structures Report, Part A
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Study Summary

Research revealed that the building erroneously known as the Hugh Mercer Apothecary was likely constructed in the 1770s or 1780s by McCall, Smillie, and Co. of Glasgow or Robert Johnston. Its earliest known use was as a shop-house for the merchants Elezier Callender and David Henderson. After Henderson died in 1838, the building was used as a working-class residence until it was briefly used as a car dealership in the 1920s. In 1928, the Citizen's Guild of George Washington's Boyhood Home purchased the building and restored it as a shrine to Hugh Mercer.

The building is significant because it is the only surviving example of an eighteenth-century side gable shop-house in Fredericksburg. It has moderate-to-high integrity as many of the materials and workmanship date to the building's period of significance as a shop-house. However, some of the building's integrity was lost during the 1920s restoration. Despite its age, the building is in good condition with few signs of deterioration. Where deterioration is occurring, moisture appears to be the cause.

Project Data

The Hugh Mercer Apothecary building is located at 1020 Caroline Street in Fredericksburg, Virginia. It is owned and operated by Washington Heritage Museums. Research on the building was conducted from September to December 2014 by students in the Building Forensics class (HISP 461) from the University of Mary Washington's Department of Historic Preservation. The students used archival research, observation, and non-destructive and minimally-invasive investigations to study the building.

Historical Background and Context

The Virginia House of Burgesses established the town of Fredericksburg in 1728.¹ The town's location at the fall line of the Rappahannock River made the site an integral location for commerce. Despite this advantageous location few people resided in the town until 1732 when Henry Willis established a tobacco inspection station to facilitate exports.² Fredericksburg's tobacco processing capabilities encouraged significant growth during the mid-eighteenth century. The earliest surviving buildings in Fredericksburg were constructed during this time period.

Surviving eighteenth-century shop-house buildings in Fredericksburg such as the Lewis Store (1749), the Ballentine Store (1787), Thornton's Tavern (1746), and James Brown's silversmith shop (1785) reveal a number of structural similarities to the building erroneously called the Hugh Mercer Apothecary. The Lewis Store, the Ballentine Store, Thornton's Tavern, and James Brown's silversmith shop are all one-and-a-half story, gable end buildings with little-to-no setback from the street.³ The Hugh Mercer Apothecary is also a one-and-a-half story building with little setback from the street. However, it is the only surviving eighteenth-century side gable shop-house. All of the buildings including the Hugh Mercer Apothecary have Aquia sandstone foundations with the exception of the Lewis Store. The Lewis Store is brick while the other buildings are brace frame with horizontal siding. The Hugh Mercer Apothecary is the only shop-house that uses a mixture of brick and brace framing in its structural system. All of the buildings have brick chimneys. The Lewis Store has an interior end chimney whereas Thornton's Tavern and the silversmith shop have exterior end chimneys. The Hugh Mercer Apothecary also has interior end brick chimneys, but it is the only shop-house where the flues are joined into one chimney stack instead of each having their own chimney stack.⁴ The fireplaces heated private spaces in all of these shop-houses, not the selling floor.

Although there may be some replacements, the eighteenth-century shop-houses also have similarities in their doors and windows. All of the buildings have paneled doors, although the silversmith shop also has a board-and-batten side door. The Apothecary has one paneled door and one door with glass panes, which is a replacement for an earlier door.⁵ The buildings have slight differences in glazing. The Lewis Store, the Ballentine Store, and Thornton's Tavern all

¹ Ted Kamieniak, *Fredericksburg Virginia: Eclectic Histories for the Curious Reader* (Charleston: The History Press, 2008), 9.

² Paula S. Felder, *Fredericksburg on the Rappahannock River: Historic Gateway* (Heathsville, VA: Northumberland Historical Press, 2003), 2-3.

³ The Lewis Store was later raised to two stories after it was damaged by fire in 1807. "Fielding Lewis' Store: The Oldest Retail Building in America?," Historic Fredericksburg Foundation, <http://hffi.org/fieldinglewisstore.html> (accessed September 14, 2014).

⁴ The north chimney was replaced with a larger brick chimney during the 1927 restoration. "Tompkins Motor Co.," photograph, Rorrer Collection, Central Rappahannock Heritage Center, <http://crhc.pastperfect-online.com/33327cgi/mweb.exe?request=record;id=55B2376F-120A-43D5-A1D6-542836448706;type=102> (accessed September 14, 2014).

⁵ The photograph of Tompkins Motor Co. shows that the door was installed by 1920. "Tompkins Motor Co.," photograph, Rorrer Collection, Central Rappahannock Heritage Center, <http://crhc.pastperfect-online.com/33327cgi/mweb.exe?request=record;id=30B814DF-3F36-45C2-8A01-296503425177;type=102> (accessed September 14, 2014).

have rectangular transoms. The Hugh Mercer Apothecary also has a rectangular, five light transom, but it is also unique in that it has another transom with tracery. The eighteenth-century shop houses have a variety of windows. The Lewis Store also has nine-over-six light windows while Thornton's Tavern has six-over-six light windows with the exception of one two-over-two glazed window. The Ballentine Store and the silversmith shop have an eclectic mix of windows. The Ballentine Store has six-over-nine glazing on the gable end with a six-over-six light window above the door. On the side, there are four-over-six and four light windows. The silversmith shop has four-over-four glazed windows on the gable end with a six-over-six window above the door. The Hugh Mercer Apothecary is the only shop-house that has nine-over-nine glazing. It originally had six-over-six windows in the shop and nine-over-nine windows in the residential portion.⁶ The Ballentine Store has four-over-four light dormer windows while Thornton's Tavern, the silversmith shop, and the Hugh Mercer Apothecary have six-over-six dormers windows.

The Hugh Mercer Apothecary was likely built in the 1770s after the wood used in its construction was felled in 1771.⁷ The Apothecary's earliest documented use was as a dwelling and shop for the merchants Callender and Henderson. Elezzer Callender and David Henderson purchased part of town lot 47 and 48 from Robert Johnson, who was likely the builder, in 1786.⁸ By 1788, Henderson resided at lot 47 and 48.⁹ In 1796, an attached kitchen and lumber house existed behind the current structure and a stable stood at the corner of Amelia and Princess Anne Streets.¹⁰ The northern-most room was likely Callender and Henderson's shop, while Henderson and his family lived in the southern portion of the house and above the shop. The attached lumber house most likely served as storage for some of the larger merchandise such as pork and millstones while smaller goods were kept on the shelves in the shop.¹¹ After Callender's death in 1799, Henderson bought out the Callender family's share of the property.¹² By 1805, Henderson owned the two-story, ca. 1800 house next door as an additional residence and converted his lumber house to a counting house.¹³ Henderson's need for an accounting office instead of a lumber house reflected the economic success of his business as he transitioned from selling generic goods like pork to more specialized goods such as medicines. Although he sold a variety of goods, Henderson most actively advertised patent medicines, such as "Dr. Sanford's Improved

⁶ John T. Goolrick, *The Life of General Hugh Mercer: With Brief Sketches of General George Washington* (1906), 32 , <https://books.google.com/books?id=T71KAAAAYAAJ&pg=PA3&dq=John+Goolrick+1906&hl=en&sa=X&ei=ycSJVKyQMIHbsAT80IDIAw&ved=0CC4Q6AEwAw#v=onepage&q=apothecary&f=false> (accessed Dec ember 11, 2014).

⁷ The dendrochronology report on the Hugh Mercer Apothecary dates the cutting of the wood to 1771.

⁸ Fredericksburg Virginia Courthouse, Deed book A, page 287.

⁹ 1788 Fredericksburg Land Tax Book, <http://resources.umwhisp.org/Fredericksburg/landtax/fburg1788lt.htm> (accessed September 14, 2014).

¹⁰ Mutual Assurance Society of Virginia, microfilm, reel 1, vol. 3, policy No. 52, 1796.

¹¹ Callender and Henderson, "Pork and Millstones for Sale," microfilm, *Virginia Herald*, June 26, 1788, from Simpson Library at the University of Mary Washington.

¹² Fredericksburg Virginia Courthouse, Deed book C, page 285.

¹³ Mutual Assurance Society of Virginia, microfilm, reel 8, vol. 61, policy No. 107, 1805. The two-story house existed by 1800. Mutual Assurance Society of Virginia, microfilm, reel 1, vol. 4, policy 253-254, 1800.

Powder of Bark.”¹⁴ Henderson sold patent and non-prescription medicines from 1789 to 1829.¹⁵ His investment in selling medications demonstrated the prominence of folk and domestic medicine during the late-eighteenth and early-twentieth century’s at a time when many people had limited access to professional healthcare.¹⁶ By 1822, he built an additional brick kitchen behind the two-story dwelling.¹⁷ Henderson’s modifications to his property reflected the profitability of trade in Fredericksburg during the late-eighteenth and early-nineteenth centuries. His increasing number of property purchases in the town including buying his own wharf and a warehouse reflected his growing wealth as a merchant.¹⁸

After David Henderson’s death in 1838, the buildings were used as dwellings for working class owners and tenants.¹⁹ Henderson’s descendants continued to live there until 1863, when part of the Fitzhugh family bought the property.²⁰ The buildings underwent few significant changes during this period. One-story porches or additions were added to the ca. 1800 dwelling between 1857 and 1881.²¹ The one-story addition or porch on the brick kitchen was replaced with a larger one-story addition by 1886.²² By 1902, more porches had been added to the rear and the original back porch was enclosed.²³ Between 1902 and 1907, one of the porches was removed from the brick kitchen.²⁴ In 1919, the Fitzhugh’s sold the property to John F. Gouldman Jr.²⁵ Gouldman leased the buildings to Tompkins Motor Company as a temporary headquarters.²⁶ By 1927, the Sanborn Maps listed the building as “old and vacant.”²⁷

During the 1920s, the 150th anniversary of the American Revolution led to a movement to preserve eighteenth-century buildings. In Fredericksburg, this movement manifested itself through the preservation and restoration of the Mary Washington House, the Rising Sun Tavern,

¹⁴ David Henderson, “Dr. Sanford’s Improved Powder of Bark,” microfilm, *Virginia Herald*, April 11, 1812, from Simpson Library at the University of Mary Washington.

¹⁵ *Journal of Fredericksburg History*, vol. 6, (Fredericksburg: Historic Fredericksburg Foundation, 2002), 46-47.

¹⁶ Kamieniak, *Fredericksburg*, “It’s Good for What Ails Ya: Tree Bark, Madstones, Turpentine, Dirty Underdrawers and Other Southern Folk Remedies,” 35-36.

¹⁷ Mutual Assurance Society of Virginia, microfilm, reel 11, vol. 80, policy No. 4246, 1822.

¹⁸ 1815 Fredericksburg Land Tax Book, <http://resources.umwhisp.org/Fredericksburg/landtax/fburg1815lt.htm> (accessed September 14, 2014).

¹⁹ Fredericksburg Virginia Courthouse, Deed book L, page 43.

²⁰ Fredericksburg Virginia Courthouse, Deed book T, page 393.

²¹ Sheet 4, 1881, Fredericksburg, Virginia, Sanborn Maps, *UMW Department of Historic Preservation*, (accessed September 14, 2014).

²² Sheet 2, 1886, Fredericksburg, Virginia, Sanborn Maps, *UMW Department of Historic Preservation*, (accessed September 14, 2014).

²³ Sheet 6, 1902, Fredericksburg, Virginia, Sanborn Maps, *UMW Department of Historic Preservation*, (accessed September 14, 2014).

²⁴ Sheet 6, 1907, Fredericksburg, Virginia, Sanborn Maps, *UMW Department of Historic Preservation*, (accessed September 14, 2014).

²⁵ Fredericksburg Virginia Courthouse, Deed book 52, page 159.

²⁶ “Tompkins Motor Co.,” photograph, Rorrer Collection, Central Rappahannock Heritage Center, <http://crhc.pastperfect-online.com/33327cgi/mweb.exe?request=record;id=30B814DF-3F36-45C2-8A01-296503425177;type=102> (accessed September 14, 2014).

²⁷ Sheet 11, 1927, Fredericksburg, Virginia, Sanborn Maps, *UMW Department of Historic Preservation*, (accessed September 14, 2014).

and Kenmore as shrines to famous Revolutionary-era residents. In 1928, the Citizen's Guild of George Washington's Boyhood Home, Inc. bought the vacant buildings from W.J. and Belle Ford, with the intent to restore the building as a shrine to Hugh Mercer even though it never was his apothecary.²⁸ Between 1928 and 1929, the two-story residence on Caroline Street was demolished.²⁹ Likewise, the buildings fronting Amelia Street were also razed.³⁰ The double doors on Amelia Street were also removed and a larger brick chimney and mantelpiece put in their place.³¹ Since the construction in the late 1920s, the remaining building has been operated as the Hugh Mercer Apothecary Shop.

²⁸ Fredericksburg Virginia Courthouse, Deed book 61, page 401.

²⁹ Frances Benjamin Johnston, photographer, "Hugh Mercer Apothecary Shop, Fredericksburg, Virginia," photograph, 1927-1929, From the Library of Congress: *Carnegie Survey of the Architecture of the South*, <http://www.loc.gov/pictures/item/csas200906065/> (accessed September 14, 2014).

³⁰ Frances Benjamin Johnston, photographer, "Hugh Mercer Apothecary Shop, Fredericksburg, Virginia," photograph, 1927-1929, From the Library of Congress: *Carnegie Survey of the Architecture of the South*, <http://www.loc.gov/pictures/item/csas200906063/> (accessed September 14, 2014).

³¹ Frances Benjamin Johnston, photographer, "Hugh Mercer Apothecary Shop, Fredericksburg, Virginia," photograph, 1927-1929, From the Library of Congress: *Carnegie Survey of the Architecture of the South*, <http://www.loc.gov/pictures/item/csas200906071/> (accessed September 14, 2014).

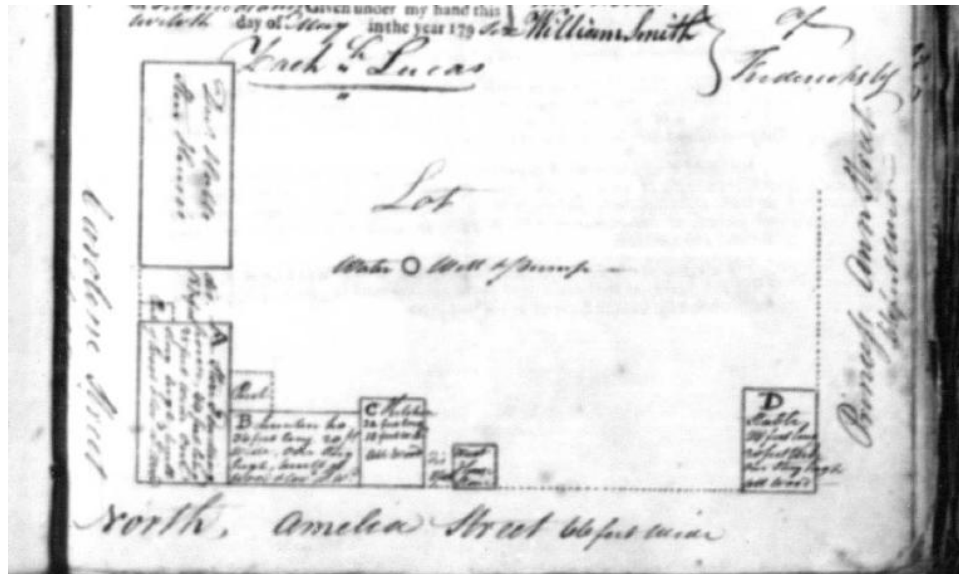


Figure 1 shows the earliest known footprint of Callender and Henderson's Buildings in 1796. The lumber house (B) and kitchen (C) stand behind the shop-house (A) on Caroline Street. Note that the two-story building does not yet exist. (Mutual Assurance Society of Virginia, microfilm)



Figure 2: By 1805, Henderson owned the two-story building (A). He also changed the lumber house into a counting (counting) room (C). (Mutual Assurance Society of Virginia, microfilm)

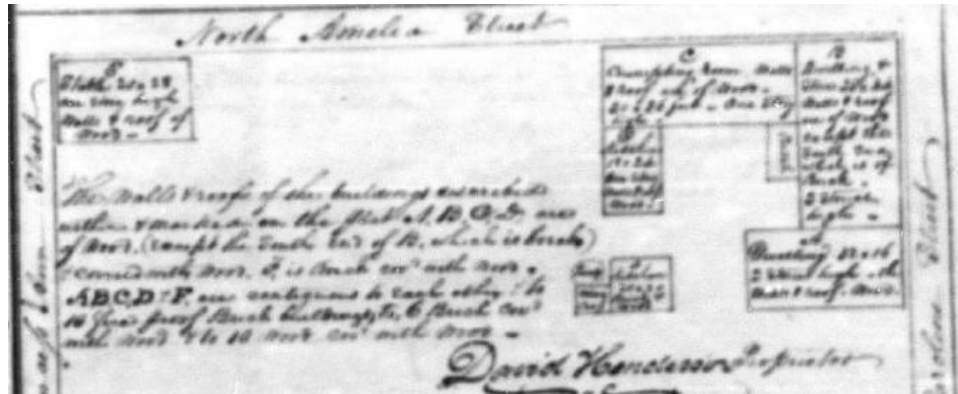


Figure 3: By 1822, Henderson built a second kitchen behind the two-story dwelling. (Mutual Assurance Society of Virginia, microfilm)

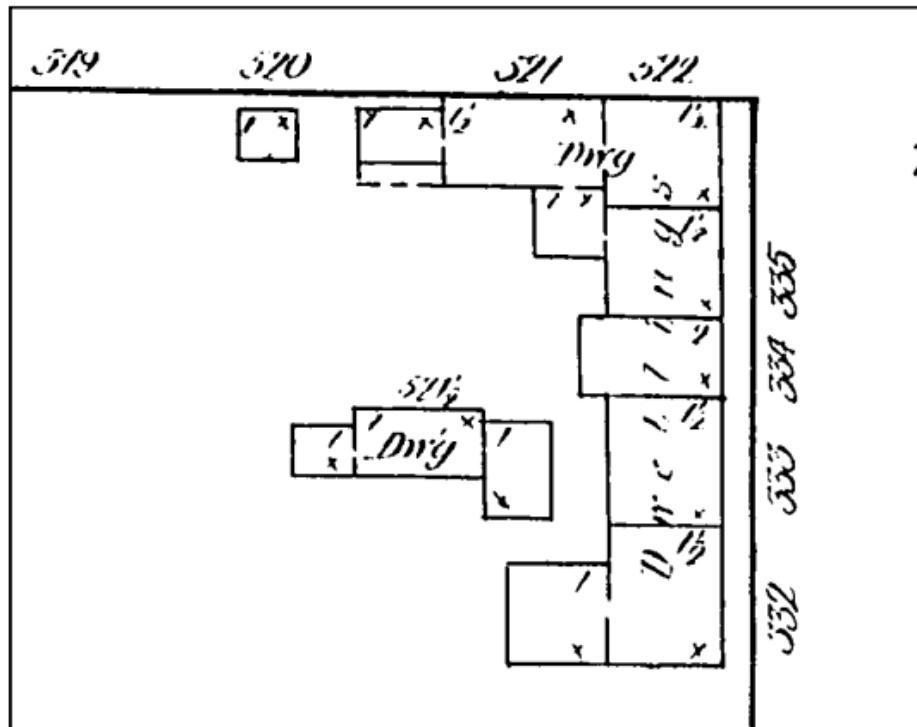


Figure 4: This image from the 1886 Sanborn Maps shows how little the buildings changed since 1857. (Sanborn Maps, from the UMW Department of Historic Preservation)

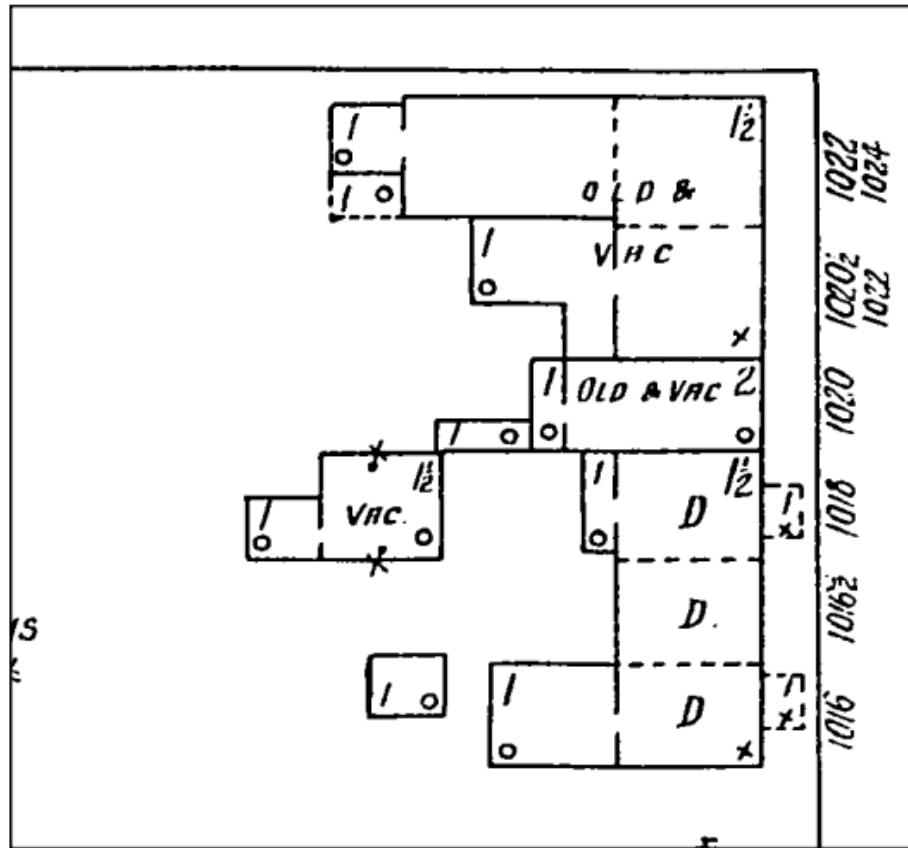


Figure 5: By 1927, the buildings were "old and vacant." (Sanborn Maps, from the UMW Department of Historic Preservation)

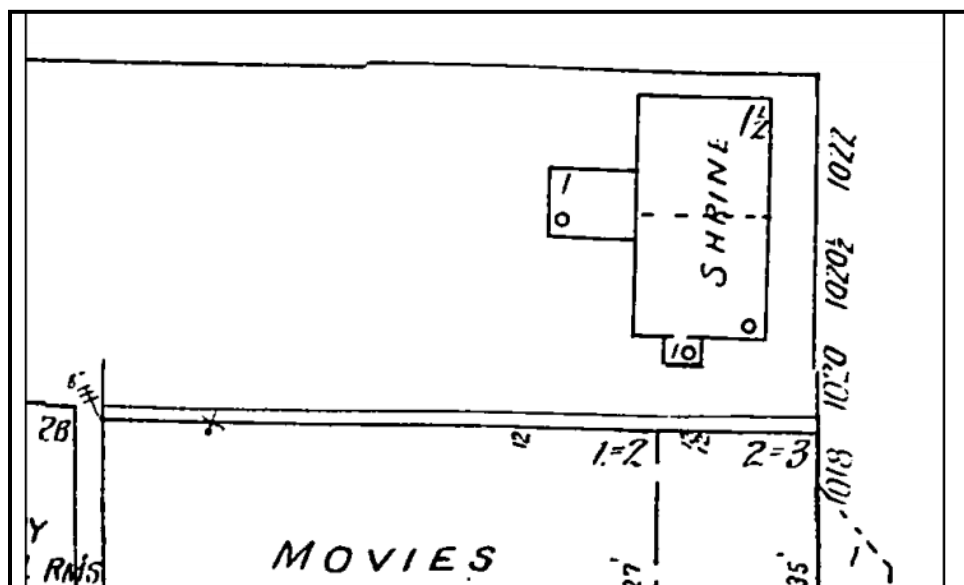


Figure 6: This 1947 Sanborn Map shows the footprint of the Hugh Mercer Apothecary after the 1920s restoration. (Sanborn Maps, from the UMW Department of Historic Preservation)



Figure 7: This 1920s image shows the buildings in use as Tompkins Motor Co. Note the adjoining two-story and one-and-a-half story buildings. (Image from the Rorrer Collection at the Central Rappahannock Heritage Center)



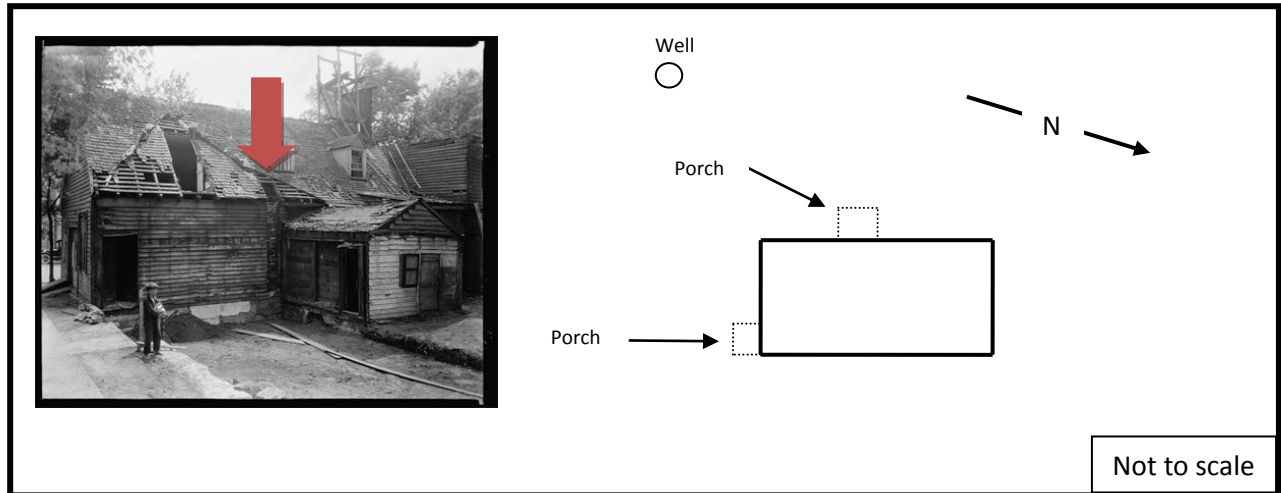
Figure 8: This photograph by Frances Benjamin Johnston shows the site of the one-and-a-half story buildings, as well as the ongoing demolition of the two-story building. The image also shows the original wood shingles as well as the door that connected the shop to the lumber/compting house. (Image from the Carnegie Survey of the Architecture of the South Collection at the Library of Congress)



Figure 9: This image by Frances Benjamin Johnston shows the shelves original to the Henderson period that were uncovered during the restoration. It also show the mantelpiece that was installed during the 1920s restoration. (Image from the Carnegie Survey of the Architecture of the South Collection at the Library of Congress)

Chronology of Development and Use

1771



The wood used in the construction of the building was felled. The building was likely constructed shortly thereafter. Only the first floor of the building was originally finished. The party wall was lowered, as shown in the Frances Benjamin Johnston photograph, and the second floor was likely finished in 1786 when the building became a shop-house.

1772

Merchant Henry Mitchell signed a lease and release of the property to merchants McCall, Smillie, and Co. of Glasgow.

1775-1783

The American Revolution was fought. Little construction took place in Fredericksburg during this time.

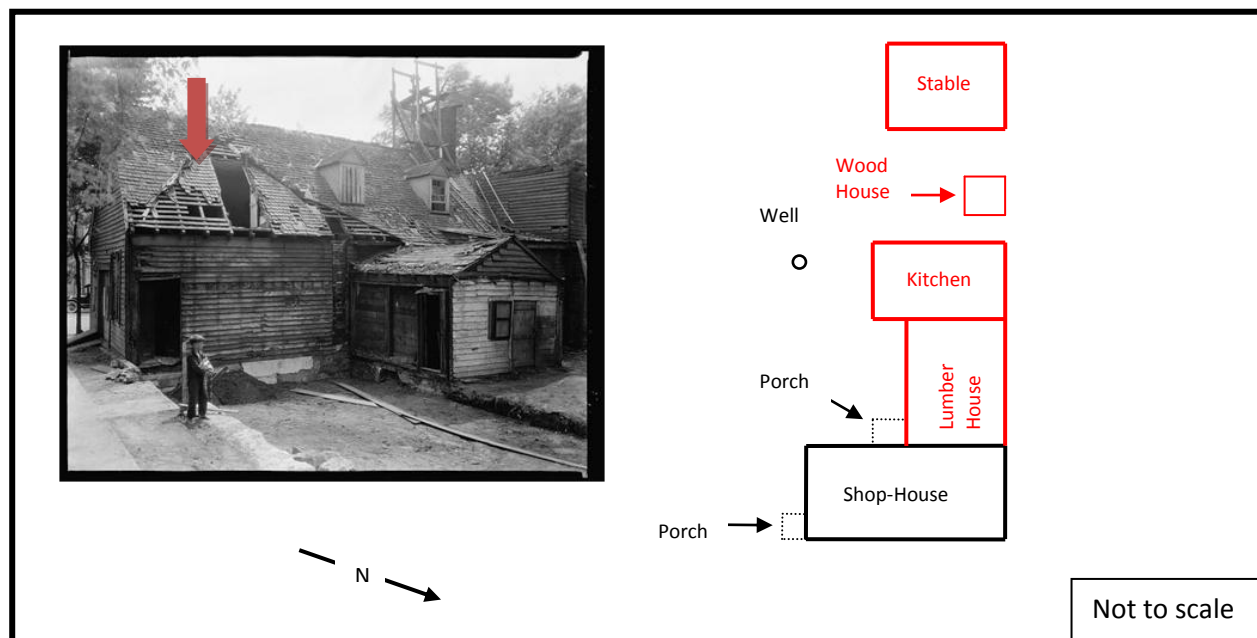
1782

Robert Johnson purchased the property from McCall, Smillie, and Co.

1786

Merchants Elezier Callender and David Henderson purchased the buildings from Robert Johnson. Henderson resided in the building by 1788.

1796

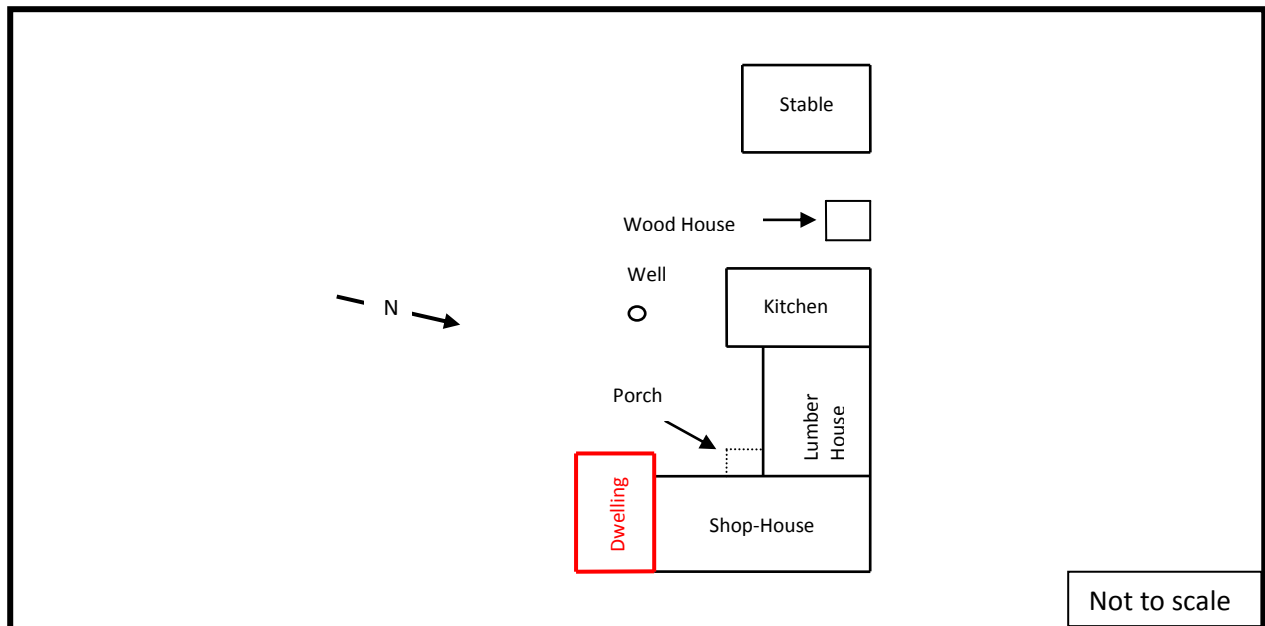


By 1796, the lumber house, kitchen, wood house, and stable existed on the lot. Some of the buildings may have been constructed at the same time as the shop-house. The lumber house was a later addition because it encapsulated shingles on the shop-house, as shown by the Frances Benjamin Johnston photograph. The good condition of the shingles indicates that the lumber house was built shortly after the shop-house, likely in the 1780s. The buildings were all made of wood except for the south wall of the shop-house, which was brick. The entrance to the southern part of the building was likely located off the porch. The northern-most room was likely Callender and Henderson's shop, while Henderson and his family lived in the southern portion of the house and above the shop. The attached lumber house most likely served as storage for some of the larger merchandise such as pork and millstones while smaller goods were kept on the shelves in the shop. The "wood house" is shown on few representations of the building footprints. It was likely a shed or slave quarters.

1799

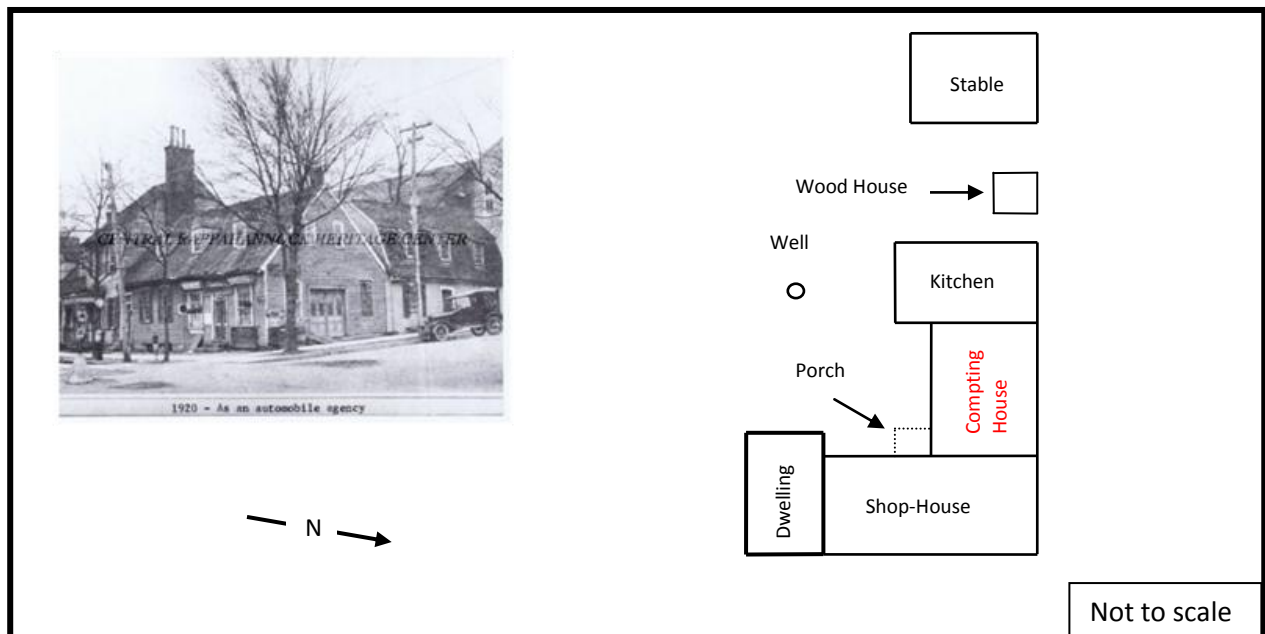
Elezier Callender died and Henderson purchased the property from the Callender family.

1800



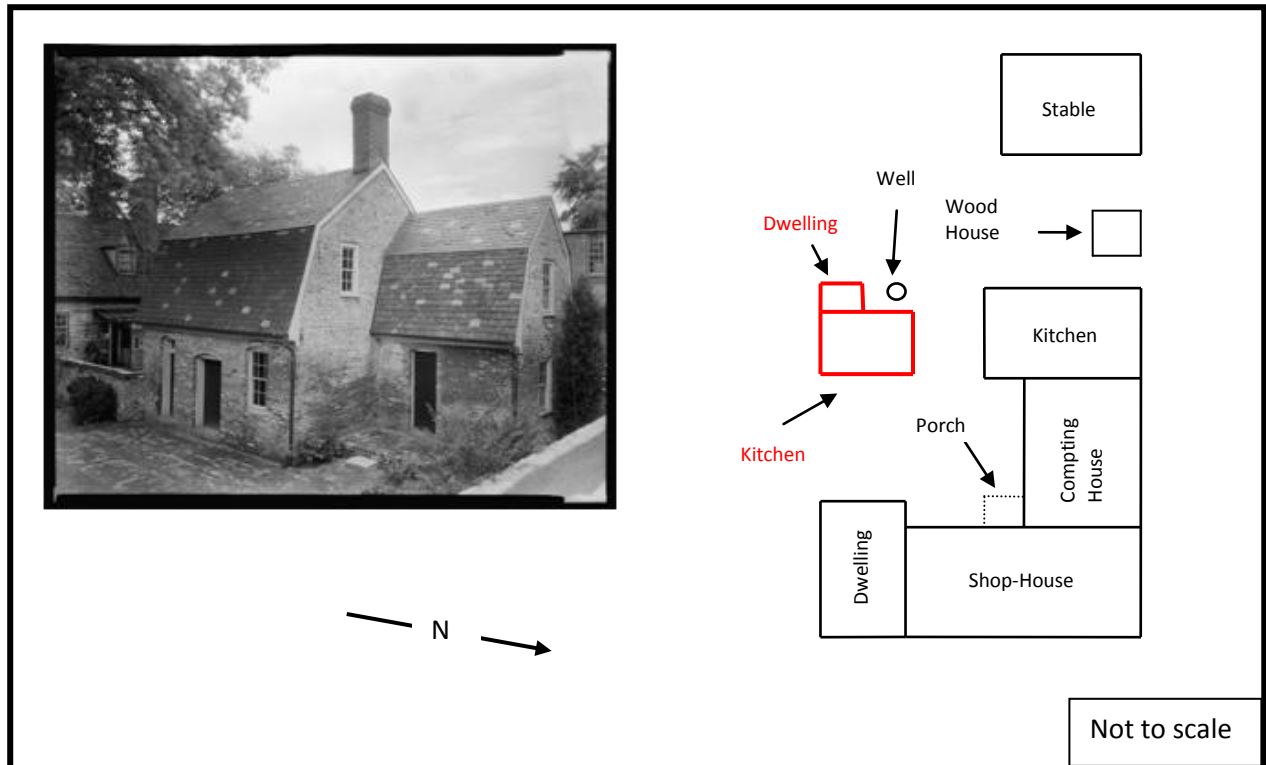
By 1800, the south porch had been removed and a two-story wood dwelling constructed. The entrance to the dwelling portion of the shop-house was likely moved to its current location.

1805



By 1805, Henderson owned the two-story dwelling as an additional residence and converted the lumber house into a compting house. Henderson's need for an accounting office reflected the success of his business. This ca. 1920 photograph shows the wooden shop-house, two-story dwelling, and compting house.

1822

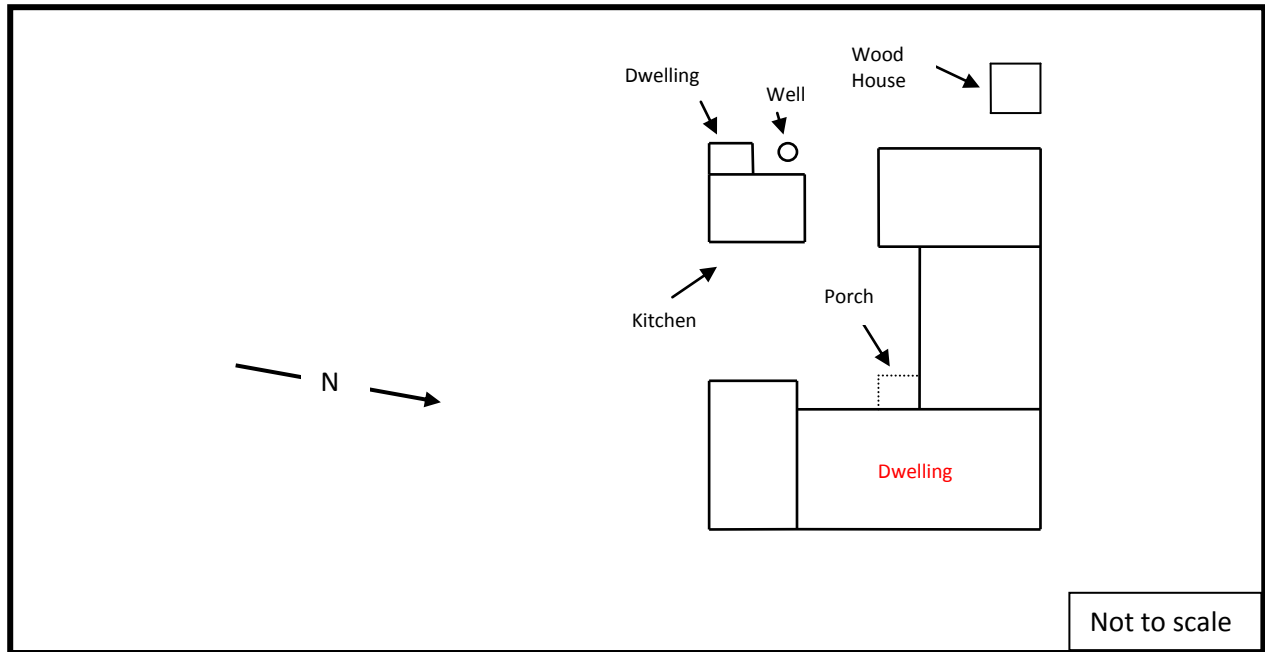


Between 1814 and 1822, Henderson built an additional brick kitchen and dwelling on the interior of the lot. The 1920s photograph by Frances Benjamin Johnston depicts the brick kitchen and dwelling.

1838

David Henderson died. The buildings were willed to his family. His son, Alexander Henderson subdivided the property, giving the two-story building and brick kitchen to Edward and Jesse Henderson in 1839.

1843



Between 1836 and 1843, the Hendersons sold the property containing the stable. The Baptist Church was built on the site of the stable in the 1850s. The Hendersons also discontinued their business and converted the shop-house to a dwelling.

1860

Anne Fitzhugh purchased the two-story building and kitchen from Eliza Morgan.

1861-1865

The Civil War was fought. The Hendersons sold the property on the corner to George Fitzhugh, Anne's husband, in 1863. The buildings were used as working class housing.

Diagram illustrating a residential development layout. The layout includes a Kitchen, Porches and/or 1 Story Additions, Dwellings, and a Wood House. A North arrow (N) is shown pointing towards the top-left. A scale indicator states "Not to scale".

1886

Porch

Wood House

Dwelling

Porches and/or 1 Story Additions

1 Story Addition

Porch

Dwelling

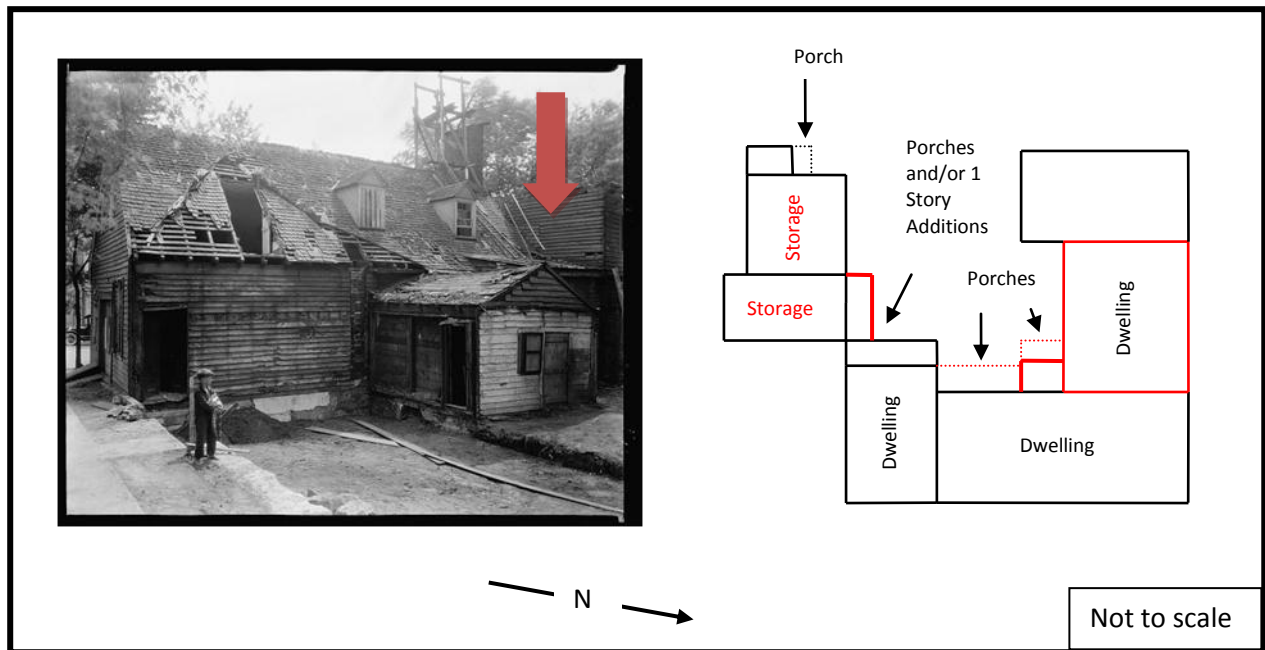
Dwelling

N

Not to scale

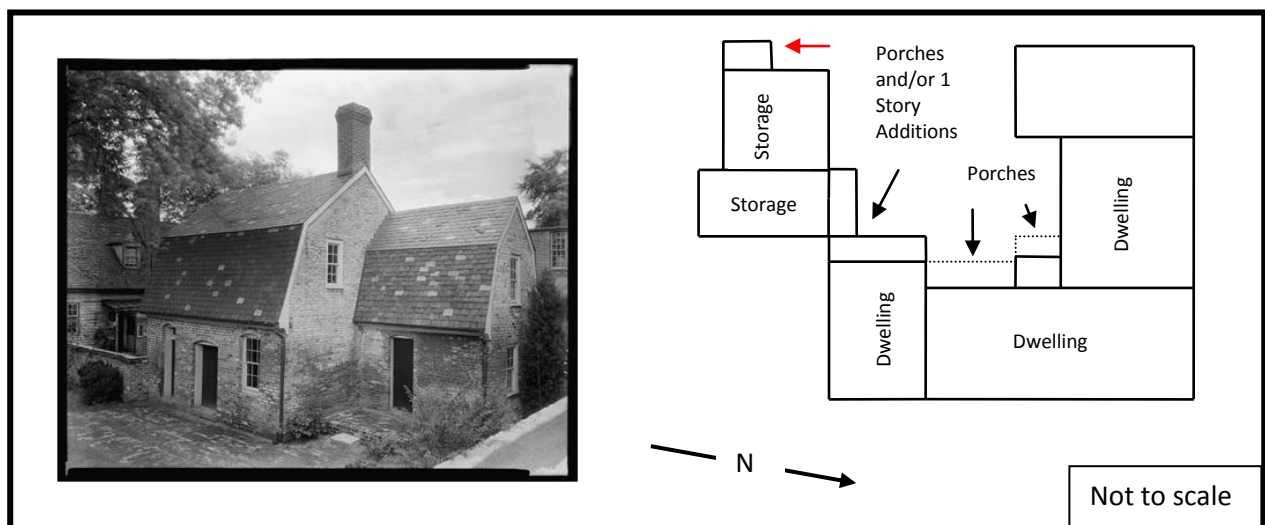
19

1902



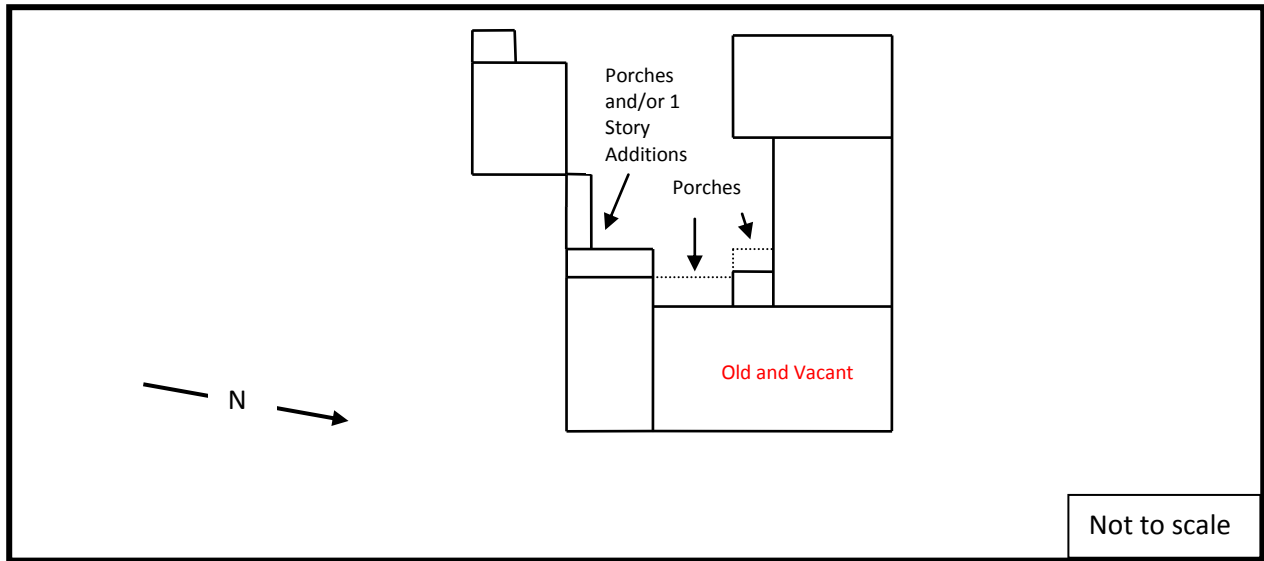
By 1902, the brick kitchen and one-story addition were used as storage. The one-story structure connecting it to the two-story dwelling was extended. The roof of the former lumber house was changed from a gable roof to a gambrel roof. Porches were added to the rear of the dwelling, encapsulating the old rear porch which was enclosed during this period. The 1920s photograph by Frances Benjamin Johnston shows the enclosed porch, as well as one of the 1886-1902 porches next to it.

1907



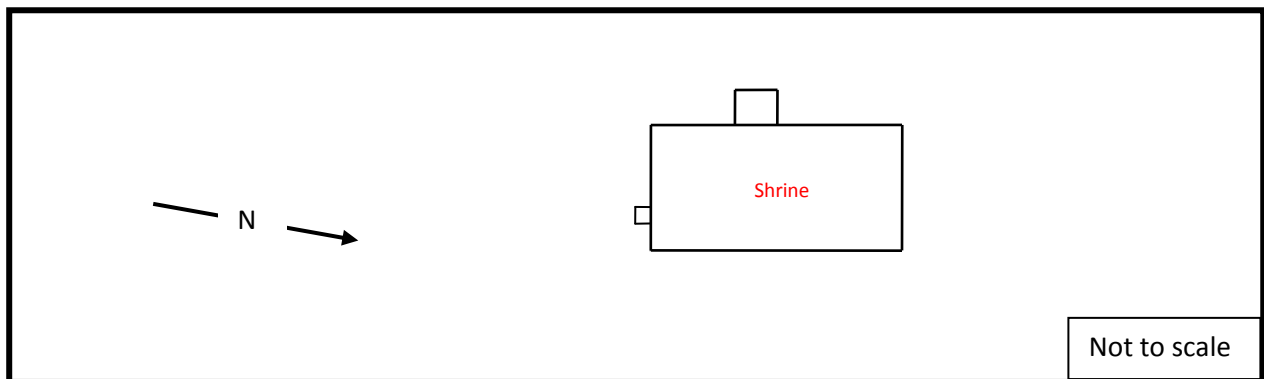
By 1907, the porch attached to the brick kitchen and dwelling had been removed as shown in the Frances Benjamin Johnston photograph.

1927



By 1927, the buildings were listed as “old and vacant” on the Sanborn Map. The Citizen’s Guild of George Washington’s Boyhood Home, Inc. purchased the property in 1928 and “restored” it as a shrine to Hugh Mercer.

1930



Only the shop-house and enclosed back porch remained after the “restoration.” A bulkhead was added to the south side of the building and the bulkhead on the north side was removed. The wood shingle roof was replaced with slate. The dormers were also resided with slate instead of wood.

Many of the modifications made to the interior of the existing Hugh Mercer Apothecary building likely occurred during this construction. The access doors on the north side of the building were replaced with a chimney, fireplace, and mantelpiece. Shelves dating to the building’s period as a shop were uncovered and additional shelves based on the originals added. Decorative moldings were modified to accommodate moved doorways and mantelpieces in other rooms were altered



as evidenced by ghosting. These modifications were likely made during the “restoration” since they lack the patina of age of the original decorative woodwork and are similar to the woodwork known to have been 1920s installations.

This image shows ghosting on the mantelpiece, as well as a newer shelf with fretwork that may have been added in during the “restoration.”

Physical Description

Structural Systems

Likely built in the 1770s, the building known today as the Hugh Mercer Apothecary is a one-and-a-half story, six-bay, single-pile building. The building has a continuous Aquia sandstone foundation and was built with brace frame construction. The exterior walls are covered with weatherboard siding except for the south wall, which is primarily brick.

In addition to its exterior walls, the Hugh Mercer Apothecary also has one interior load bearing wall. This party wall runs east to west, dividing the building through its center. Historically, the side north of the wall on the first floor was commercial space while the south side was residential. The party wall is made of sandstone in the basement and brick resting upon a wooden sill with carpenters marks on the first floor. The wall does not extend to the upper floor. In the basement, a load bearing summer beam rests across the north sill and the interior load bearing, masonry wall. It terminates short of the south sill, where it is supported by a post made from modern dimensional lumber. This post was likely installed when the building was “restored” in the 1920s and the bulkhead was added.

Like many eighteenth century buildings in Fredericksburg, the Hugh Mercer Apothecary is constructed using brace framing. In brace frame construction, the sill was laid on top of the foundation. The joists were fasted to the sill with mortise and tenon or lap joints as were the corner posts. Down braces supported the corner posts. Partially load-bearing studs were placed between the corner posts, allowing for the weatherboard cladding to be fastened to the exterior and the lath and plaster walls to the interior. The plates rested on top of the studs and corner posts on the long walls of the building. The second floor joists were laid on top of the plates. Raising plates, which carried the common rafters, were nailed to the joists. Collar ties were half dovetailed to the rafters to keep them from spreading. The rafters were joined together with pegged mortise and tenon joints.³² The use of brace frame construction is common in Fredericksburg’s eighteenth-century frame buildings like the Mary Washington House (ca. 1760) and the Rising Sun Tavern (ca. 1760 –originally built as a house). Summer beams were only used in buildings over 20 feet deep, like the Hugh Mercer Apothecary which is 25 feet and eight inches deep.³³ Summer beams were also used in the Lewis Store (1749), Thorton’s Tavern (1746), and the Rising Sun Tavern (ca. 1760). The Hugh Mercer Apothecary also uses a common rafter system since it is a single pile building that was originally roofed with wooden shingles, similar to the Lewis Store, the Ballentine Store (1787), and James Brown’s silversmith shop (1785).³⁴

³² Paul E. Buchanan, “The Eighteenth-Century Frame Houses of Tidewater Virginia,” in *Building Early America* (Mendham, NJ: Astragal Press, 1976), 60-61.

³³ Paul E. Buchanan, “The Eighteenth-Century Frame Houses of Tidewater Virginia,” 60-61.

³⁴ Emilie Kracen, “Historic Structures Report: Rising Sun Tavern Second Story Interior and Exterior,” from the University of Mary Washington Department of Historic Preservation, 2010, <http://cas.umw.edu/hisp/files/2011/06/Emilie-Kracen-Rising-Sun-Tavern-HSR.pdf> (accessed November 2, 2014).

A few of the structural members have been replaced including the summer beam on the north side of the party wall, the post supporting it, and a rafter. The summer beam is gang planked. Gang planking is the sistering of several pieces of dimensional lumber to form a larger structural member. Although introduced in the 1830s in the Midwest, the use of dimensional lumber and gang planking did not become common in the Mid-Atlantic until after the Civil War.³⁵

Wood Analysis

Wood samples from the basement of the Hugh Mercer Apothecary indicate that white and red oak were predominantly used for construction. Of the structural members sampled, the summer beam, the sill for the party wall, and three joists were white oak, while the exterior sill and one joist are red oak. There is also a cedar post. The floor boards were mostly pine, although samples were not taken.

Both white oak and cedar are durable and decay resistant, while red oak is strong, but has low durability and little resistance to decay.³⁶ Both native white and red oak were used for construction in the Fredericksburg area during the eighteenth and early-nineteenth century.³⁷ White oak was used for the summer beam at Belmont (1807) and a joist at Union Church in Falmouth (1819). Red oak was used in a common rafter, collar tie, and joist at the Lewis Store (1808 reconstruction) and in a common rafter and a joist in the Rising Sun Tavern (ca. 1760). Cedar posts were used in the Mary Washington House (ca. 1760).

The wooden structural members were fashioned using eighteenth-century techniques such as hand-hewing and pit sawing. The floorboards were gauged to accommodate the hand-hewn joists. These manufacturing and construction techniques reflect the eighteenth century construction date of the building.³⁸ The gang planked summer beam and a post supporting it were circular sawn, suggesting a mid-to-late eighteenth century or twentieth century replacement date.³⁹ Circular saws were first used in Fredericksburg in the 1850s, but they did not become widely used until after the Civil War.⁴⁰

Stone and Brick Analysis

The foundation of the Hugh Mercer Apothecary is almost exclusively made of Aquia Sandstone except for where the bulkhead was removed on the north side of the building, as well as the location of the present bulkhead. These foundations are made of 1920s machine pressed brick

³⁵ Gabrielle Lanier and Bernard L. Herman, *Everyday Architecture of the Mid-Atlantic* (Baltimore: Johns Hopkins University Press, 1997), 92-93.

³⁶ Martin E. Weaver, *Conserving Buildings: A Manual of Techniques and Materials* (New York: John Wiley and Sons, 1997), 14-16.

³⁷ Virginia Department of Forestry, *Common Native Trees of Virginia* (2012), 53-60, <http://www.dof.virginia.gov/print/edu/Common-Native-Trees.pdf> (accessed December 10, 2014).

³⁸ Lanier and Herman, *Everyday Architecture of the Mid-Atlantic*, 77-78.

³⁹ Lanier and Herman, *Everyday Architecture of the Mid-Atlantic*, 79.

⁴⁰ John Moncure, "Steam Sawmill for Sale," *Fredericksburg News*, November 22, 1852.

laid in common bond. The south exterior wall is laid in Flemish bond to accommodate the joining of the two flues into one chimney stack.

Both sandstone and brick were commonly used building materials in eighteenth century Fredericksburg. Aquia sandstone was quarried along the banks of the Rappahannock River at Fredericksburg as noted in an eighteenth century account, “just by the wharf is a quarry of white stone [...] appearing to be as fair and fine grained as that of Portland. Besides that, there are several other quarries in the river bank, within the limits of the town.”⁴¹ The Aquia sandstone was used in foundations because it was considerably easier to cut with eighteenth-century hand tools than the granite found in Falmouth.⁴² Bricks were also manufactured in Fredericksburg during the mid-to-late eighteenth century.⁴³

Like the wooden structural members, the stone and bricks were also manufactured using eighteenth century techniques. The sandstone was scabbed using mason’s picks, similar to the sandstone used in Thornton’s Tavern (1746) and James Brown’s silversmith shop (1785). The bricks were made from locally dug, hand pressed clay, as evidenced by its surface irregularities, rounded edges, and embedded finger prints.⁴⁴

Both Aquia sandstone and historic brick have lower durability than modern brick and other types of stone, such as granite. Their high porosity (approximately 10.19% and 20.86% water absorption capacity, respectively) and low density impact their durability, making them especially susceptible to the freeze-thaw cycle and salt efflorescence.

Mortar Analysis

The Hugh Mercer Apothecary has both lime and Portland-based mortars. The lime mortars are original to the building but can only be found in a few locations where the mortar joints have receded because of the extensive repointing with Portland mortar. Lime mortar is significantly more porous and flexible than Portland mortar. Mortar samples from the interior foundation show percent binder ranging from 2.50% to 42.65%. Samples with low lime percentages are likely bedding mortars which used clay instead of costlier mortars with high percentages of lime. Such high lime mortars were typically used for top lifts because of their weatherproofing abilities as well as their aesthetically desired white color. However, other local early-nineteenth century buildings have low percent binders in the top lift, such as the Jane Beale House which has approximately 1.54% lime binder. The inconsistencies in the mortar mixes reflect the production techniques of the era as there was no standard mortar mix.⁴⁵ The aggregate at the Jane Beale House is approximately 88.49% sand and 9.96% clay. In Fredericksburg, clay was historically

⁴¹ Silvanus Jackson Quinn, *The History of the City of Fredericksburg, Virginia* (1908), page 43, http://books.google.com/books?as_brr=1&id=9EUOAAAAIAAJ&dq=%22History+of+Fredericksburg%2C+Virginia+%22&q=Wheadon#v=onepage&q=Byrd&f=false (accessed November 13, 2014).

⁴² Harley J. McKee, “Brick and Stone: Handicraft to Machine,” in *Building Early America* (Mendham, NJ: Astragal Press, 1976), 78-79.

⁴³ Weedon v. Lipscomb, 350-323 (1786).

⁴⁴ Harley J. McKee, “Brick and Stone: Handicraft to Machine,” 82-89.

⁴⁵ Paul E. Buchanan, “The Eighteenth-Century Frame Houses of Tidewater Virginia,” 60.

added to mortars because it was cheap. However, it weakens the mortar by making it less effective. Clay is less prevalent in top lifts because there is a higher lime content to give the mortar its aesthetically desired white appearance. The aggregate in the sample for the Jane Beale House also contained charcoal impurities from burning oyster shells in the lime rick to make lime mortar.⁴⁶ There was also brick dust, likely added to help the mortar set and to provide some of the hydraulic properties of Portland cement. The original mortar of the Hugh Mercer Apothecary likely includes clay, charcoal, and brick dust as part of the aggregate because they were frequently used in eighteenth and early-nineteenth century mortar production processes.

⁴⁶ Carl R. Lounsbury, “Brickwork,” in *The Chesapeake House*, ed. Cary Carson and Carl Lounsbury (Chapel Hill NC: University of North Carolina Press, 2013), 243.



Figure 2 shows a hewn and pit sawn joist.



Figure 3 shows the summer beam comprised of gang planked and circular sawn lumber.



Figure 4 shows the scabbed Aquia sandstone.



Figure 5 shows the hand pressed brick with finger prints.



Figure 6 shows Portland mortar repairs.

Evaluation of Significance

The building's period of significance is from 1771 when the building was constructed to 1838 when David Henderson died. During this time period, the building served as a shop-house for the merchants David Henderson and Elezzer Callender. The building's design reflects its use as a shop-house with the treatment of the exterior doors and windows dividing the building into the northern shop and the southern dwelling. The north side of the building is a large open room, reflecting its use as a selling floor. The northern room also has large front windows that used to be highlighted with ornamental pediments to attract the attention of potential buyers, as well as shelves on the back wall, demonstrating its design as a store. The dwelling in the southern portion has two smaller rooms with fireplaces, fewer and smaller windows, a separate front door, and access to the basement and the attic, revealing its design as a private space as stores did not have fireplaces or direct access to the spaces above and below the shop.⁴⁷ The building is significant because it is one of the few surviving eighteenth century shop-houses in Fredericksburg. It is also the only remaining eighteenth-century, side gable shop-house in Fredericksburg. Side gable shop-houses may have also been a rarity in the eighteenth century since other local examples have end gables. The building has moderate-to-high integrity as many of the materials and workmanship found date to its period of significance.

Sandstone

The Aquia sandstone foundation is authentic to the building. The foundation beneath the enclosed porch is also original to the building because it is continuous with the main foundation. The stone was likely quarried locally along the riverbank since such stone was found in great supply as noted in an eighteenth century account, "just by the wharf is a quarry of white stone [...] appearing to be as fair and fine grained as that of Portland. Besides that, there are several other quarries in the river bank, within the limits of the town."⁴⁸ The stone was finished by scabbing, a process in which eighteenth-century masons roughly dressed the stone by spalling pieces of the stone off with a pick, leaving irregular parallel marks.⁴⁹ Areas where the material integrity of the sandstone has been compromised includes where a portion of the south foundation has been removed to accommodate the 1920s bulkhead.⁵⁰ The brick portion of the north foundation is also not original to the building. It was installed along with a large brick

⁴⁷ The Fielding Lewis Store is similar in that it had a large display window with ornamental stonework. It also did not provide access to the basement or the attic through the selling floor, which also did not have a source of heat. "Fielding Lewis' Store: The Oldest Retail Building in America?," Historic Fredericksburg Foundation, <http://hffi.org/fieldinglewisstore.html> (accessed September 14, 2014).

⁴⁸ Silvanus Jackson Quinn, *The History of the City of Fredericksburg, Virginia* (1908), page 43, http://books.google.com/books?as_brr=1&id=9EUOAAAIAAJ&dq=%22History+of+Fredericksburg%2C+Virginia+%22&q=Wheadon#v=onepage&q=Byrd&f=false (accessed November 13, 2014).

⁴⁹ Harley J. McKee, "Section II, Stone," in *Introduction to Early American Masonry: Stone, Brick, Mortar and Plaster* (Washington, D.C.: Preservation Press, 1973), 23-24.

⁵⁰ Frances Benjamin Johnston, photographer, "Hugh Mercer Apothecary Shop, Fredericksburg, Virginia," photograph, 1927-1929, From the Library of Congress: *Carnegie Survey of the Architecture of the South*, <http://www.loc.gov/pictures/item/csas200906064/> (accessed November 13, 2014).

chimney when the bulkhead was removed in the 1920s.⁵¹

Brick

The majority of the south brick wall is also original to the building's construction despite some areas where the brick was altered for the insertion and removal an adjacent ca. 1800 building. The wall is laid in a Flemish bond, indicative of the builder's original intent to expose the wall.⁵² The irregular edges, round corners, and finger prints of the hand pressed bricks show that they were made from locally dug clay and fired using eighteenth-century techniques. The bricks in the north chimney and foundation, as well as those in the bulkhead, are not original to the building because they have the sharper edges and fewer irregularities consistent with machine-pressed brick.⁵³ Machine-pressed brick was not made in Fredericksburg until the 1850s.⁵⁴

Wooden Structural Members

Many of the building's wooden structural members also date to the period of significance. The building was built with brace frame construction as was typical of the period. Brace frame construction used timber framing along with diagonal bracing, load-bearing studs, and a mixture of nails and joinery.⁵⁵ The original structural members were fashioned using the eighteenth-century techniques of hand-hewing, which creates score marks, and pit sawing, which leaves irregular vertical marks.⁵⁶ Structural members that do not date to the period of significance include the gang planked summer beam and the post in the north room, as well as a rafter in the crawl space off the second floor hall, because they are made from circular-sawn dimensional lumber.⁵⁷ The circular saw was not used in Fredericksburg until the 1850s.⁵⁸ Similarly, gang planking was not widely used in the mid-Atlantic until the mid-to-late nineteenth century.⁵⁹

⁵¹ Tompkins Motor Co.,” photograph, Rorrer Collection, Central Rappahannock Heritage Center, <http://crhc.pastperfect-online.com/33327cgi/mweb.exe?request=record&id=55B2376F-120A-43D5-A1D6-542836448706&type=102> (accessed November 13, 2014).

⁵² Mutual Assurance Society of Virginia, microfilm, reel 1, vol. 3, policy No. 52, 1796.

⁵³ Harley J. McKee, “Section II, Brick,” in *Introduction to Early American Masonry: Stone, Brick, Mortar and Plaster* (Washington, D.C.: Preservation Press, 1973).

⁵⁴ Aler and Coleman, “New Brick Yard,” *Weekly Advertiser*, October 28, 1854.

⁵⁵ Paul E. Buchanan, “The Eighteenth-Century Frame Houses of Tidewater Virginia,” in *Building Early America* (Mendham, NJ: Astragal Press, 1976), 60-61.

⁵⁶ John Fitchen, *Building Construction before Mechanization* (Cambridge, M.A.: MIT Press, 1986), 135-136.

⁵⁷ Carl W. Condit, *American Building* (Chicago: University of Chicago Press, 1982), 41.

⁵⁸ John Moncure, “Steam Sawmill for Sale,” *Fredericksburg News*, November 22, 1852.

⁵⁹ Gabrielle Lanier and Bernard L. Herman, *Everyday Architecture of the Mid-Atlantic* (Baltimore: Johns Hopkins University Press, 1997), 79.

Roof

The slate roof does not date to the period of significance. It was installed during the 1920s construction.⁶⁰ The original roof was made of wooden fish scale shingles made using a draw knife.⁶¹ The dormers were also originally clad in weatherboard, not shingles.⁶²

Siding

The weatherboard siding does not retain much material integrity. Only the siding on the east elevation of the building and some of the siding on the west elevation appear to be original.⁶³ The beaded weatherboard on the north side of the building, the bulkhead, and the enclosed porch was installed during the 1920s restoration.⁶⁴ Historically, the building would have had sawn weatherboard siding that was approximately eight inches wide and ten to twenty feet long. The weatherboards would have been hand planed and beaded.⁶⁵ The siding on the front of the building, which is likely original, is approximately three-quarter inches to one inch thick. It is a half inch to three-quarter inches thick in areas without siding that dates to the period of significance, such as the bulkhead, the enclosed porch, the north side of the building, and in places on the back of the of the building.

Windows

The building's windows retain moderate integrity. Most of the building's window panes are made from cylinder glass. There are also several panes made from crown glass and plate glass. Cylinder glass was manufactured by blowing glass into a cylindrical tube, cutting it lengthwise after it cooled, and flattening it in an oven. Crown glass was made by blowing a large glass bubble and then spinning it into a flat disk.⁶⁶ Cylinder glass is wavy while crown glass has concentric circular ripples. Since both cylinder glass and crown glass were used for windows

⁶⁰ Frances Benjamin Johnston, photographer, "Hugh Mercer Apothecary Shop, Fredericksburg, Virginia," photograph, 1927-1929, From the Library of Congress: *Carnegie Survey of the Architecture of the South*, <http://www.loc.gov/pictures/item/csas200906067/> (accessed September 14, 2014).

⁶¹ Frances Benjamin Johnston, photographer, "Hugh Mercer Apothecary Shop, Fredericksburg, Virginia," photograph, 1927-1929, From the Library of Congress: *Carnegie Survey of the Architecture of the South*, <http://www.loc.gov/pictures/item/csas200906066/> (accessed September 14, 2014).

⁶² Frances Benjamin Johnston, photographer, "Hugh Mercer Apothecary Shop, Fredericksburg, Virginia," photograph, 1927-1929, From the Library of Congress: *Carnegie Survey of the Architecture of the South*, <http://www.loc.gov/pictures/item/csas200906064/> (accessed September 14, 2014).

⁶³ Frances Benjamin Johnston, photographer, "Hugh Mercer Apothecary Shop, Fredericksburg, Virginia," photograph, 1927-1929, From the Library of Congress: *Carnegie Survey of the Architecture of the South*, <http://www.loc.gov/pictures/item/csas200906066/> (accessed September 14, 2014).

⁶⁴ Frances Benjamin Johnston, photographer, "Hugh Mercer Apothecary Shop, Fredericksburg, Virginia," photograph, 1927-1929, From the Library of Congress: *Carnegie Survey of the Architecture of the South*, <http://www.loc.gov/pictures/item/csas200906063/> (accessed September 14, 2014).

⁶⁵ Paul E. Buchanan, "The Eighteenth-Century Frame Houses of Tidewater Virginia," 73.

⁶⁶ Kenneth M. Wilson, "Window Glass in America," in *Building Early America* (Mendham, NJ: Astragal Press, 1976), 150-151.

during the building's period of significance, they should both be treated as having material integrity, although one was likely a later replacement.⁶⁷ Plate glass, which has few surface irregularities, was not widely available until the late-nineteenth and early-twentieth centuries and can be seen in the windows of the enclosed porch.⁶⁸ The windows in the shop made from cylinder glass are all 1920s replacements with nine-over-nine glazing to match the windows on the dwelling. The original windows had six-over-six glazing as well as decorative pediments above the front windows.⁶⁹ The north-most dormer on the west side of the building is a 1920s replacement for a doorway that led into the no longer extant rear addition. This doorway replaced an original dormer when the addition was built, likely in the 1780s.⁷⁰

Doors

Many of the buildings doors date to the period of significance. The six paneled doors, as well as the south set of double doors on the east elevation, reflect the influences of late Georgian styling on the building.⁷¹ Likewise, the batten doors could also date to the building's period of significance except for the bulkhead door. The glazed doors were added in the early-twentieth century.⁷² Similarly, the louvered door was added during or after the 1920s restoration.⁷³

⁶⁷ *Practical Building Conservation: Glass and Glazing*, (2011), page 17.
[http://books.google.com/books?id=m3dqs6zRCcEC&pg=PA17&dq=crown+glass+\(window\)+america&hl=en&sa=X&ei=hVppVMiJJ4P4yQSCsoEo&ved=0CEsQ6AEwBQ#v=onepage&q=crown%20glass%20\(window\)%20america&f=false](http://books.google.com/books?id=m3dqs6zRCcEC&pg=PA17&dq=crown+glass+(window)+america&hl=en&sa=X&ei=hVppVMiJJ4P4yQSCsoEo&ved=0CEsQ6AEwBQ#v=onepage&q=crown%20glass%20(window)%20america&f=false) (accessed November 16, 2014).

⁶⁸ Brent Hull, *Historic Millwork: A Guide to Restoring and Re-creating Doors, Windows, and Moldings of the Late Nineteenth through Mid-Twentieth Centuries*, (2003), page 52.
<http://books.google.com/books?id=PGGPbEACpGUC&pg=PA52&dq=historic+window+glass&hl=en&sa=X&ei=HldpViePD4jYggTctYLIDQ&ved=0CDIQ6AEwAA#v=onepage&q=historic%20window%20glass&f=false> (accessed November 16, 2014).

⁶⁹ John T. Goolrick, *The Life of General Hugh Mercer: With Brief Sketches of General George Washington* (1906), 32 ,
<https://books.google.com/books?id=T71KAAAAYAAJ&pg=PA3&dq=John+Goolrick+1906&hl=en&sa=X&ei=ycSJVKyQMIHbsAT80IDIAw&ved=0CC4Q6AEwAw#v=onepage&q=apothecary&f=false> (accessed Dec ember 11, 2014).

⁷⁰ Frances Benjamin Johnston, photographer, "Hugh Mercer Apothecary Shop, Fredericksburg, Virginia," photograph, 1927-1929, From the Library of Congress: *Carnegie Survey of the Architecture of the South*, <http://www.loc.gov/pictures/item/csas200906063/> (accessed September 14, 2014).

⁷¹ Stephen Calloway, *Elements of Style: An Encyclopedia of Domestic Architectural Detail*, ed. Alan Powers, 4th ed. (Buffalo, NY: Firefly, 2012), 138-142.

⁷² John T. Goolrick, *The Life of General Hugh Mercer*, 32,
<https://books.google.com/books?id=T71KAAAAYAAJ&pg=PA3&dq=John+Goolrick+1906&hl=en&sa=X&ei=ycSJVKyQMIHbsAT80IDIAw&ved=0CC4Q6AEwAw#v=onepage&q=apothecary&f=false> (accessed Dec ember 11, 2014).

⁷³ Frances Benjamin Johnston, photographer, "Hugh Mercer Apothecary Shop, Fredericksburg, Virginia," photograph, 1927-1929, From the Library of Congress: *Carnegie Survey of the Architecture of the South*, <http://www.loc.gov/pictures/item/csas200906063/> (accessed September 14, 2014).

Hardware

Some of the hardware dates to the building's period of significance. Hand wrought, iron HL and L hinges, strap hinges, and thumb latches date to the eighteenth century, as do rim locks. The locking mechanisms of rim locks are enclosed in a wooden or iron box. The Carpenter lock on the enclosed porch may date to the period of significance since it was patented in 1830. Carpenter locks resemble rim locks except they are made of brass.⁷⁴ Porcelain doorknobs, the brass door knobs on the doors with glazing, and butt hinges are not original to the building. Brown clay Bennington and porcelain doorknobs were not patented until the mid-nineteenth century.⁷⁵ Similarly, cast brass door knobs did not become available until the 1840s.⁷⁶ Compact butt hinges used in the building are a twentieth century invention.⁷⁷

Flooring

Most of the flooring is authentic to the building. The irregular, wide floorboards have few knots, indicative of first growth wood and preindustrial manufacturing processes such as gauging the undersides of the floorboards as seen in the basement to accommodate the irregularities of the joists they rest upon. They were also nailed to the joists with hand-headed trim nails, as was common in the late-eighteenth century.⁷⁸ The upstairs flooring is not original to the building since the attic space was probably not initially finished. The party wall was likely lowered and the flooring installed directly on top of it. The attic was probably finished during the period of significance because the irregular floorboards are also made of first growth wood and installed with hand-headed trim nails. The floor has been replaced in front of the north and southeast fireplaces where there used to be a grate for the furnace.⁷⁹ The brick flooring in the basement is also typical of eighteenth century buildings.⁸⁰ The poured concrete floors date to the late-nineteenth to twentieth century.⁸¹

⁷⁴ Donald Streeter, "The Historical Development of Hand Forged Iron Builders' Hardware," in *The Technology of Historic American Buildings*, ed. H. Ward Jandl (Washington: Foundation for Preservation Technology, 1983), 1-33.

⁷⁵ Franklin Pierce Hall, "The American Doorknob," *Antique Homes: The Sales Directory of Antique and Historic Properties*, <http://www.antiquehomesmagazine.com/Articles.php?id=14> (accessed December 5, 2014).

⁷⁶ Marye Audet, "Antique Doorknob Identification," *Love to Know*, http://antiques.lovetoknow.com/Antique_Doorknob_Identification (accessed December 5, 2014).

⁷⁷ "Hinge History: Historical Development and Advances of the Hinge," *Hardware Source: The Hinge Experts*, <http://www.hardware-source.com/hinge-resource-center/hinge-history/historical-development-advances-of-hinges/> (accessed December 5, 2014).

⁷⁸ Lee H. Nelson, "Nail Chronology As An Aid to Dating Old Buildings," *American Association for State and Local History Technical Leaflet 48*, *History News*, Vol. 24, Number 11, November, 1968.

⁷⁹ Frances Benjamin Johnston, photographer, "Hugh Mercer Apothecary Shop, Fredericksburg, Virginia," photograph, 1927-1929, From the Library of Congress: *Carnegie Survey of the Architecture of the South*, <http://www.loc.gov/pictures/item/csas200906071/> (accessed September 14, 2014).

⁸⁰ Calloway, *Elements of Style*, 120.

⁸¹ Carl W. Condit, *American Building* (Chicago: University of Chicago Press, 1982), 155-159.

Walls

The lath and plaster walls are probably not original to the building. The lath in the upstairs crawl space was circular sawn, indicating that the plaster was replaced after the 1850s, likely during the 1920s restoration.⁸² Changes in the locations of doorways also support this: the doorway between the shop and the dwelling was moved, as was the entrance to basement stairs. The old doorways were covered, and a coating of plaster was applied to the walls in an effort to mask the changes.

Decorative Woodwork

Some of the decorative woodwork does not date to the period of significance. Most of the shelves, wood paneling, and some of the trim date to the late-eighteenth and early-nineteenth centuries. Wood cornices, mopboards, wainscoting on fireplace walls, and chair rails were common during this period.⁸³ The cornices in the first floor dwelling rooms are likely original except for where a few sections have been replaced, as are the mopboards throughout the building. The wainscoted fireplace walls in the first floor dwelling rooms are also original. The chair rail in the southwest room is probably original while the upstairs chair rails likely date to when the attic was finished. The fretwork chair rails in the southeast room are probably later installations since Greek key patterns did not gain much prominence until the 1830s. They are also stylistically inconsistent with the late Georgian or early Federal paneling in the same room.⁸⁴ The decorative woodwork has been replicated in some areas such as a portion of the cornice in the southwest room and the doorframe between the shop and the dwelling. The north and south sections of shelving imitates the original shelving in the center of the shop wall. The decorative woodwork above the east exterior shop door and the door of the southwest room are both later installations.⁸⁵ All of the mantelpieces have been altered. Some of their features have been removed as evidenced through ghosting, while shelves based on the fretwork chair rail have been added. The mantelpiece in the shop is a twentieth century reproduction since it is in the location of the access doors.⁸⁶ The replicated woodwork has noticeably sharper edges and detailing because it lacks the layers of paint and patina of age of the original woodwork.

⁸² John Moncure, "Steam Sawmill for Sale," *Fredericksburg News*, November 22, 1852.

⁸³ Stephen Calloway, *Elements of Style: An Encyclopedia of Domestic Architectural Detail*, ed. Alan Powers, 4th ed. (Buffalo, NY: Firefly, 2012), 214.

⁸⁴ Calloway, *Elements of Style*, 214.

⁸⁵ John T. Goolrick, *The Life of General Hugh Mercer*, 32, <https://books.google.com/books?id=T71KAAAAYAAJ&pg=PA3&dq=John+Goolrick+1906&hl=en&sa=X&ei=ycSJVKyQMIHbsAT80IDIAw&ved=0CC4Q6AEwAw#v=onepage&q=apothecary&f=false> (accessed December 11, 2014).

⁸⁶ Tompkins Motor Co., "photograph, Rorrer Collection, Central Rappahannock Heritage Center, <http://crhc.pastperfect-online.com/33327cgi/mweb.exe?request=record&id=55B2376F-120A-43D5-A1D6-542836448706&type=102> (accessed November 13, 2014).



Figure 7 shows the scabbed Aquia sandstone.



Figure 8: This photograph by Frances Benjamin Johnston shows the original location of the bulkhead, as well as the access doors.

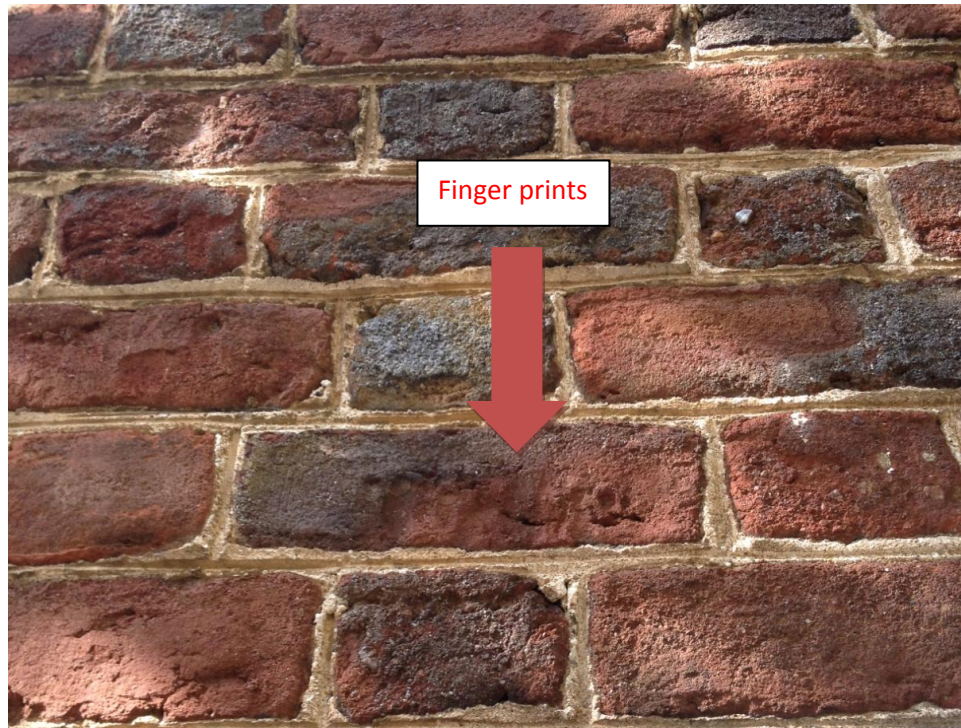


Figure 9 shows the irregularities, round edges, and finger prints of the hand pressed bricks.



Figure 10 shows the hard edges and fewer irregularities of machine pressed brick.

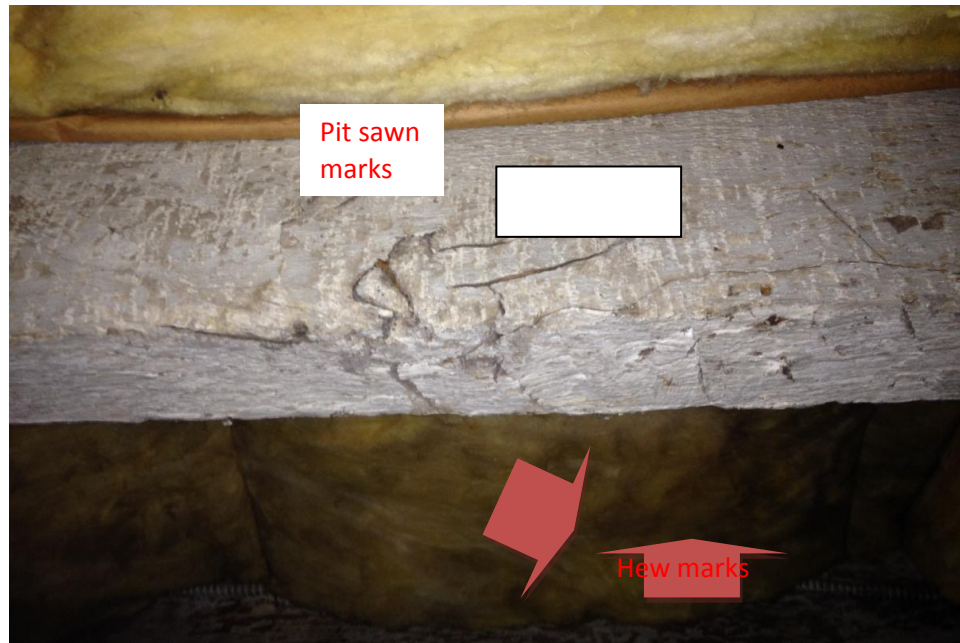


Figure 11 shows the hewing and pit sawing techniques used to fashion the structural members dating to the period of significance.



Figure 12 shows the circular sawn, gang planked summer beam.



Figure 13 shows the 20th century rafter.



Figure 14: This window primarily has cylinder glass. The blue tinted pane is crown glass.



Figure 15: Six panel doors (or double doors in this example) with deep paneling date to the building's period of significance.



Figure 16: The buildings glazed doors with this type of doorknob do not date to the building's period of significance. The pediment above the door is also not original.



Figure 17 shows an HL hinge.



Figure 18 shows where the flooring has been altered in the southeast room.



Figure 19 shows where the doorway used to be between the shop and the dwelling.



Figure 20: Irregularities in the junction of the mopboard and the chair rail show where the entrance to the basement stairs used to be.



Figure 21 shows a section of cornice that has been replaced. The original cornice has muted edges from numerous layers of paint, while the replacement cornice has sharper edges.



Figure 22: The shelving at the end was based on the original shelving in the center. Again, the new shelves have sharper molding profiles than the originals.



Figure 23 shows ghosting where features have been removed from the mantelpiece. The fretwork shelf is a newer feature that does not date to the building's period of significance.



Figure 24: The mantelpiece in the shop is not original. It dates to the 1920s construction, as shown in Figure 2.

Condition Assessment

The building known as the Hugh Mercer Apothecary is in good condition with few signs of deterioration. Where deterioration is occurring, moisture appears to be the culprit. The most prevalent degradation is in the Aquia sandstone, but there is also brick failure, mortar loss, paint failure, fungus, spalling plaster, cracks in the plaster, cracks in interior decorative elements, and deflection of the second floor.

The surface of the sandstone has failed in multiple locations on the interior, as well as the exterior of the east foundation wall. The exterior of the east foundation has experienced considerably more degradation than the other exterior foundations because the foundation plantings and mulch slow the evaporation of water, causing moisture to remain near the foundation for extended periods of time. The most extensive damage may have been caused in the past when there appears to have been a downspout from the gutters attached to the east wall beneath the middle dormer. The downspout may have leaked, causing water to collect along the foundation.⁸⁷ On both the interior and exterior, improper repointing with Portland mortars, which prevent the stone from expanding in moist conditions, combined with the cycles of hydration and dehydration of water-soluble salts result in the formation of cryptoflorescence, or the efflorescence of salt crystals inside the sandstone's pores. The formation of salt crystals creates internal pressures within the sandstone, which can lead to the failure of the stone's surface when the relative humidity regularly fluctuates around 75%. The salts go in and out of solution at 75% relative humidity; the resultant pressures created by the repeated efflorescing cause the crumbling of the stone's surface over time.⁸⁸ These conditions exist in the basement as the relative humidity fluctuated around 75% approximately five times during October. In the north room, the stone deterioration has been compounded by the Portland cement floor and moisture-imperious paint which forces water up the walls through capillary action, or rising damp. Since the sandstone has high porosity, the water containing soluble salts has risen approximately two-to-three feet above the floor, causing the surface of the affected stone to fail.⁸⁹

Similarly, some of the bricks and the mortar are failing inside the bulkhead and in the north chimney stack in the basement because of moisture from the rising damp. Additional moisture may be entering the basement and affecting the chimney stack from the exterior drain on the north side of the building. The drain could leak or overflow into the foundation and the chimney stack, then trap the moisture against the building because the drain is made of moisture-impermeable Portland cement. Brick can also be deteriorated by cryptoflorescence since older brick is porous and experiences capillary action. The salts effloresce within the brick's pores at 75% relative humidity, causing the surface of the brick to crumble over time from the internal

⁸⁷ John T. Goolrick, *The Life of General Hugh Mercer: With Brief Sketches of General George Washington* (1906), 32, <https://books.google.com/books?id=T71KAAAAYAAJ&pg=PA3&dq=John+Goolrick+1906&hl=en&sa=X&ei=ycSJVKyQMIHbsAT80IDIAw&ved=0CC4Q6AEwAw#v=onepage&q=apothecary&f=false> (accessed Dec ember 11, 2014).

⁸⁸ Martin E. Weaver, *Conserving Buildings: A Manual of Techniques and Material*, Revised Edition, (New York: Preservation Press, John Wiley & Sons, Inc., 1997), 105.

⁸⁹ David S. Watt, *Building Pathology*, Second Edition, (Oxford: Blackwell Publishing Company, 2007), 115-116.

pressures. The deterioration of the brick in the basement is compounded by the mortar being harder than the brick. Hard mortars prevent the brick from expanding in the moist conditions when cryptoflorescence occurs, causing additional stresses within the brick and leading to the more rapid deterioration of the brick's surface.

Conversely, the exterior brick on the south wall is in good condition, although there has been some mortar loss. Improper mortar repairs using smear techniques, where the mortar feathers over the edges of the brick, and hard Portland mortars which leach sulfate impurities that can make adjacent historic mortars lose their adhesion, combined with exposure to weather have caused the weaker mortars to deteriorate.⁹⁰ The improper mortar repairs also have the potential to damage the brick since they impede the brick's ability to expand and contract when changes in temperature and humidity occur or during freeze-thaw cycles when the brick is water saturated and experiences internal pressures similar to cryptoflorescence, except from the formation of ice instead.⁹¹

The building's exterior paint is deteriorating while the interior paint is in good condition. The exterior paint is crazing and peeling due to exposure to the weather and moisture. Since the building does not appear to have older layers of paint beneath the present coat, the paint is likely crazing because it has lost its ability to expand and contract with changes in temperature and humidity. Crazing and peeling limit the paint's ability to protect the wood from moisture.⁹² The interior paint is in relatively good condition except for the back of the southern front door. The paint is bubbling and cracking, likely from improper substrate preparation.⁹³

The building has also experienced interior and exterior degradation from fungi. On the interior, there is dry rot in the bulkhead sill, the coal bin, and some of the flooring in the south bedroom and upstairs hall. There is also white rot on the post in the north basement room, the coal bin, and in the holes in the ceiling of the basement bathroom. On the exterior, there is dry rot in the weatherboard on the bulkhead close to the ground, as well as at the junction of the enclosed porch and the west wall. Fungal attacks can occur if the wood's moisture content is approximately 15%-20%. Mildew, which causes little deterioration, can grow when the relative humidity is greater than or equal to 65%.⁹⁴ Although many of the rots in the Hugh Mercer Apothecary are currently inactive, there is the potential for fungal growth if the wooden members become saturated from water infiltration as spores are already present. Despite the presence of rot, little structural deterioration has occurred in the basement. Time of Flight tests and the results from resistance drilling show that posts do not have rotten areas. The relative humidity was over 65% for most of October in the basement, while it fluctuated around 65% on the first and second floors for the first half of October, allowing for the potential growth of mildew. The rots on the exterior of the building are also caused by moisture such as poor drainage near the bulkhead's foundation and leaking gutters on the enclosed porch. Moisture meter tests should be used in these locations to determine if the wood's moisture content is high enough for the rot to be active.

⁹⁰ Weaver, *Conserving Buildings*, 137-138.

⁹¹ Weaver, *Conserving Buildings*, 105-107.

⁹² Weaver, *Conserving Buildings*, 222.

⁹³ Weaver, *Conserving Buildings*, 222.

⁹⁴ Weaver, *Conserving Buildings*, 23-26.

Similarly, moisture and poor bonds with substrates have also caused the plaster to spall off the party wall above the stairs and off the basement bathroom walls. Moisture within masonry walls can dissolve the bond between the scratch coat and the masonry, particularly if the bond with the substrate is weak.⁹⁵ The poor bond with the substrate is the predominate cause of the spalling on the party wall since there is no rot in the sill beneath the plaster deterioration.

There are also hairline cracks in the gypsum plaster on the first floor. The cracks are likely caused by thermal expansion because they are in the vicinity of structural members, such as the cracking plaster along the down brace in the north room. Thermal expansion causes gypsum plaster to crack when it has a dissimilar coefficient of expansion to the structural members the lath is affixed to. Moisture and structural movement can also contribute to plaster cracks.

Likewise, cracks in interior decorative elements are also likely caused by mechanical problems and thermal and moisture-related expansion and contraction. The seams in the first floor wainscoting are cracking as is the junction between a panel and the style in mantelpiece of the south bedroom. The paint sealed the junction, preventing the panel from expanding in contracting. The cracking in the wainscoting is caused by the paint, mesh, and wood having different coefficients of expansion.

Finally, the floor in the upstairs hallway is deflecting. The flooring was installed directly above the masonry party wall. The wood is deflecting because it is softer than the masonry.

There are also several holes drilled in the structure to accommodate utilities that could potentially allow additional moisture, insects, or rodents into the building. There are also two holes in the weatherboard siding on the west wall and one hole in the enclosed porch. These holes could allow moisture to penetrate beneath the weatherboard. Similarly, there is also a small gap in the east foundation. Moisture entering through this hole is staining a nearby joist and could potentially contribute to a fungal attack. Additionally, some of the slate shingles are broken or missing, increasing the possibility of water leaking through the roof.

Despite these symptoms and causes of deterioration, the Hugh Mercer Apothecary is in relatively good condition. Time of flight tests and resistance drilling on the joists and posts in the basement show that the structural members are not deteriorating from termites or rot.

⁹⁵ Weaver, *Conserving Buildings*, 152.

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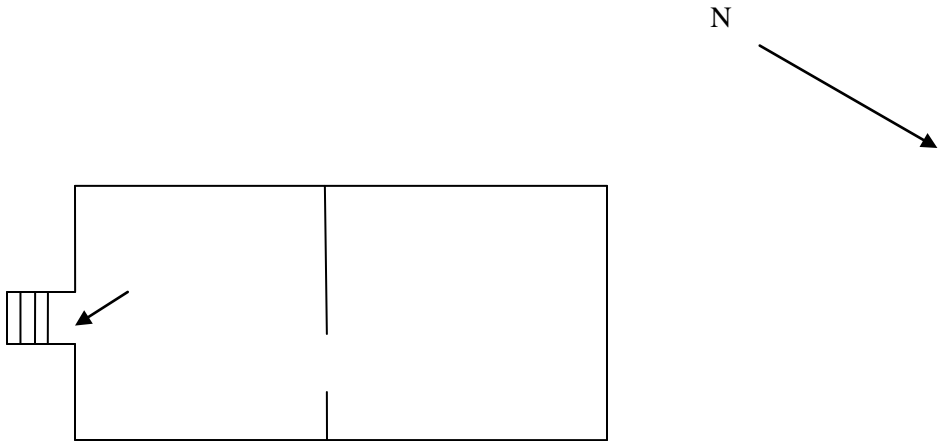
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Appendix

Wood Identification

Architectural Fragments Catalog Sheet University of Mary Washington, Fredericksburg, Virginia		
Catalog ID (running number): HMA-VA-Fredericksburg-Wood-0001	Project ID#: 0001	Sample Size: 0.37g
	Sample Type: Wood (White Oak) Element: Joist	Name of Sampler (s): Mary Fesak Alaina Haws Jordan Torrance Nick Westfall
Location Name: The Hugh Mercer Apothecary Address: 1020 Caroline Street, Fredericksburg, Virginia Geo Reference data: Latitude: 38°18'15.04" N Longitude: 77°27'35.12" W		
Date of Extraction/Provenance: (<u>Interior</u> / Exterior, Level <u>Basement</u>) Extracted 10/01/14 X: 21" from the arch (bulkhead) Y: 80" from the floor Z: 0" (surface)		
Location: 		

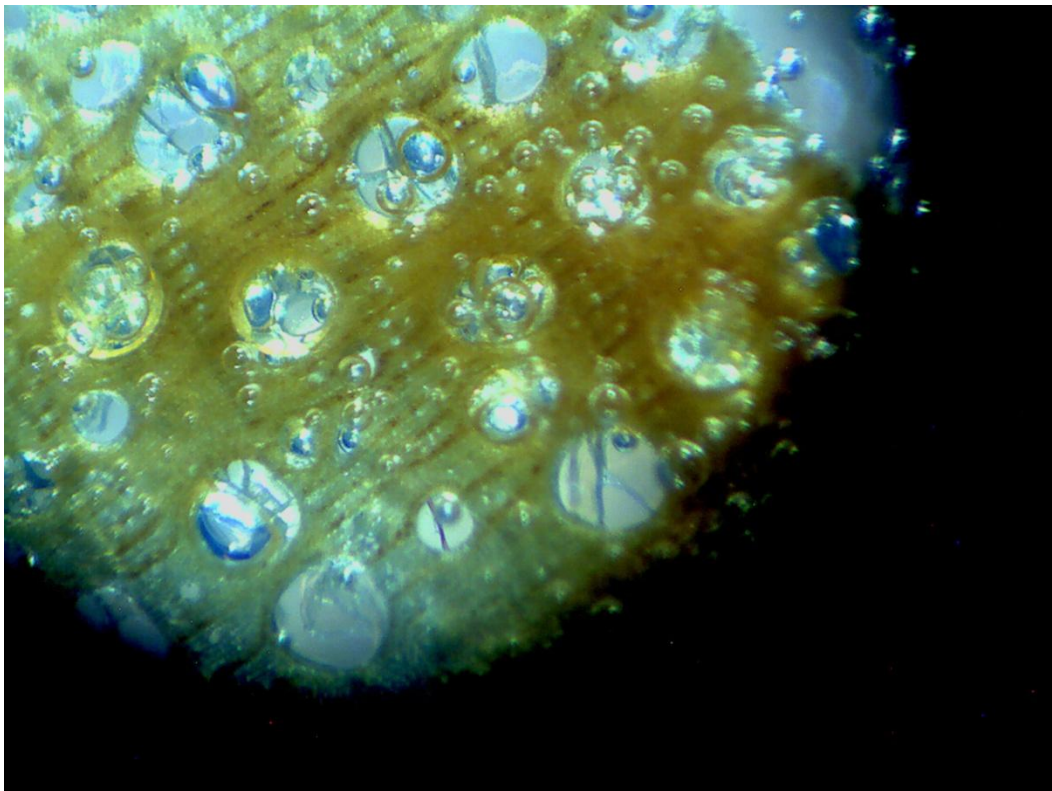
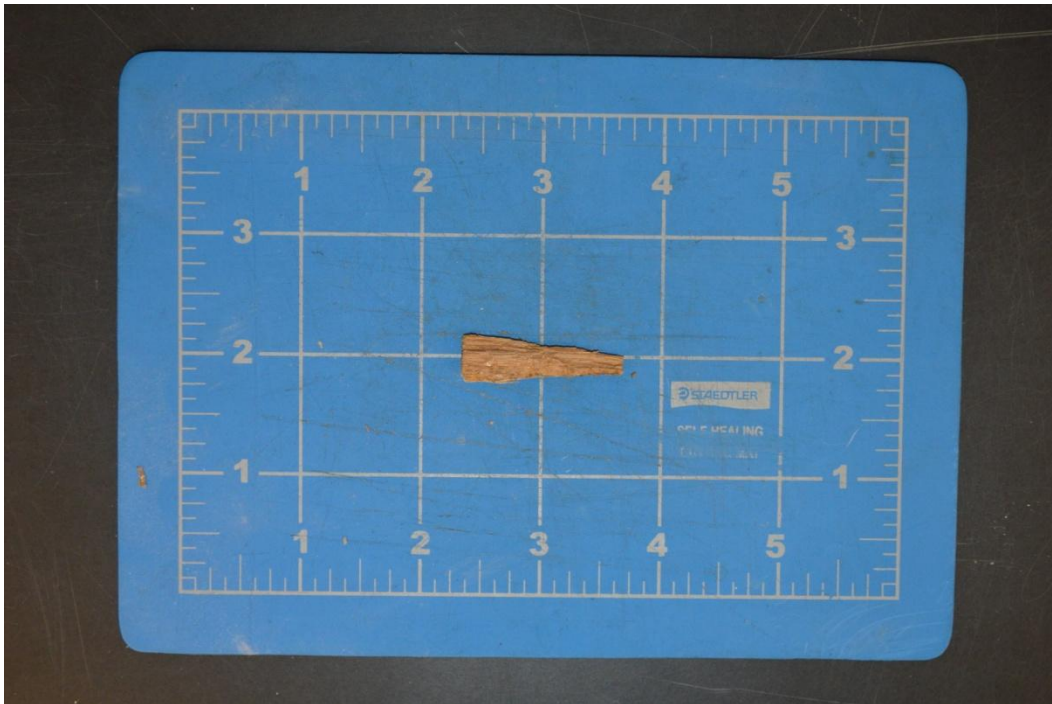


Context Image



After Sample

Catalog ID (running number): HMA-VA-Fredericksburg-Wood-0001



White Oak: A ring-porous hardwood with large early wood pores and innumerable late wood pores.

Wood Sample #1 (White Oak) Characteristics:

Pore Distribution	Ring-porous
Resin Canals?	None
Size of Rays	Larger than the pores, Visible to the naked eye
Early Wood/Late Wood Transitions	Abrupt
Color	Medium red-brown
Odor	None
Other features	Many tyloses present

Architectural Fragments Catalog Sheet
University of Mary Washington, Fredericksburg, Virginia

Catalog ID (running number): HMA-VA-Fredericksburg-Wood-0002	Project ID#: 0002	Sample Size: 1.11g
	Sample Type: Wood (Red Oak) Element: Sill	Name of Sampler (s): Mary Fesak Alaina Haws Jordan Torrance Nick Westfall

Location Name: The Hugh Mercer Apothecary

Address: 1020 Caroline Street, Fredericksburg, Virginia

Geo Reference data: Latitude: 38°18'15.04" N Longitude: 77°27'35.12" W

Date of Extraction/Provenance: (Interior / Exterior, Level Basement)

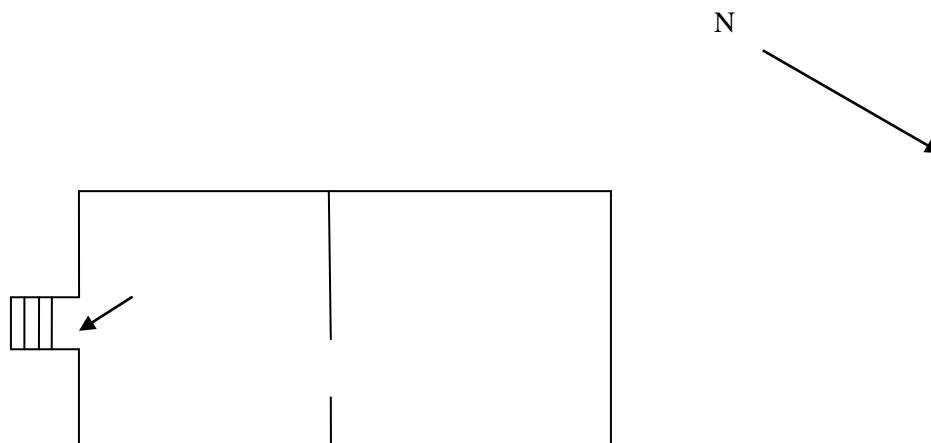
Extracted 10/01/14

X: 35.5" from the arch (bulkhead)

Y: 75.5" from the floor

Z: 15.5" from the wall

Location:



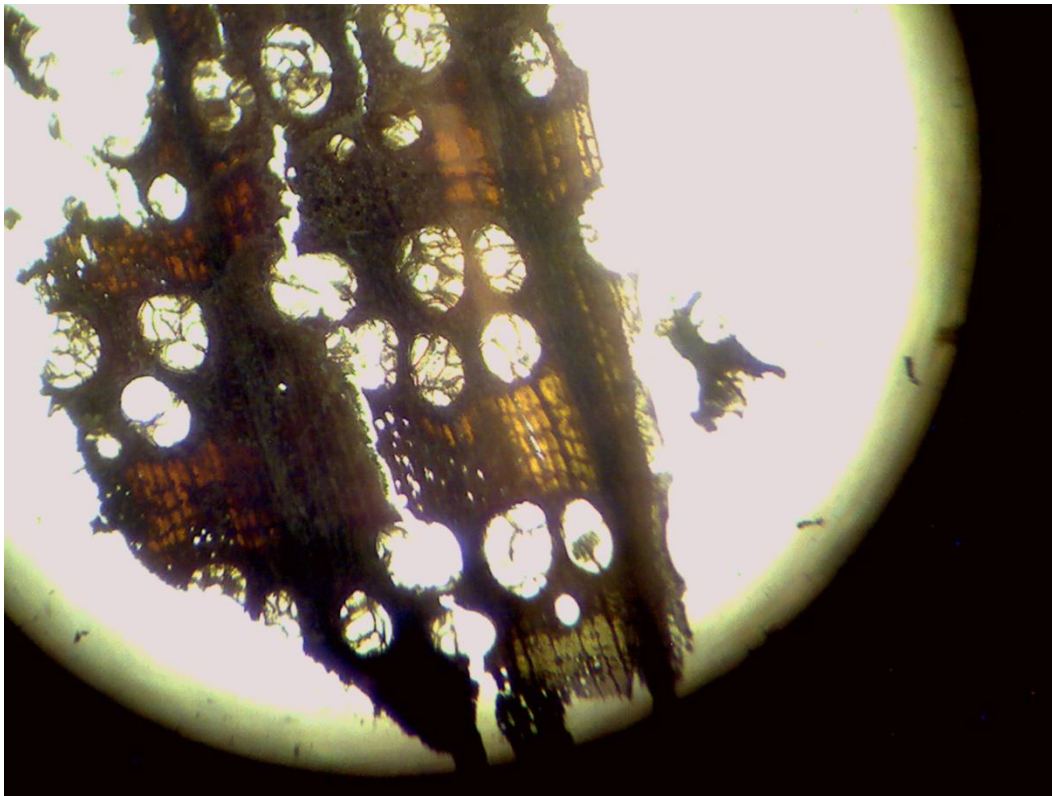
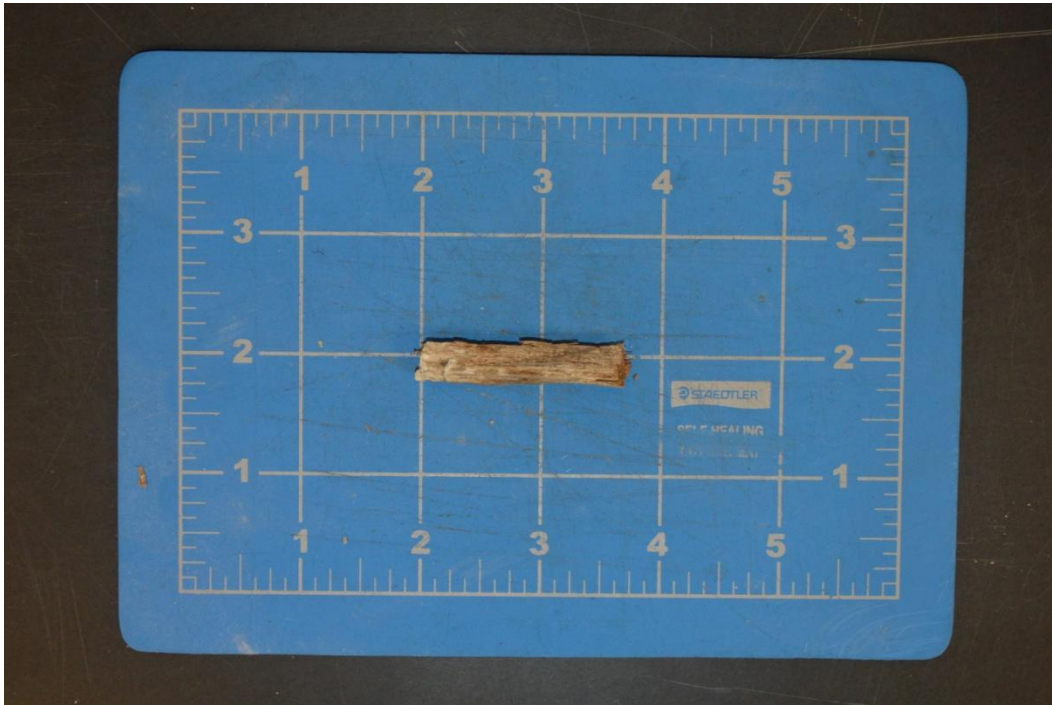


Context Image



After Sample

Catalog ID (running number): HMA-VA-Fredericksburg-Wood-0002



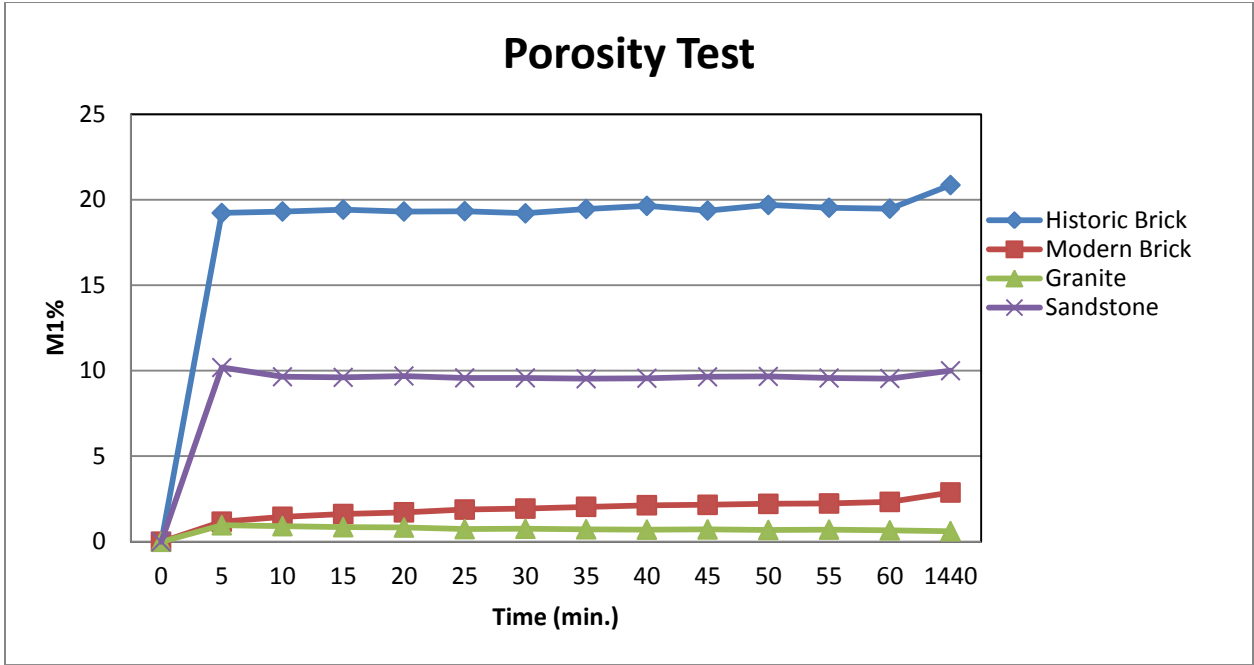
Red Oak: A ring-porous hardwood with large early wood pores and few late wood pores. The rays are smaller than the pores, distinguishing it from White Oak.

Wood Sample #2 (Red Oak) Characteristics:

Pore Distribution	Ring-porous
Resin Canals?	None
Size of Rays	Smaller than the pores, Visible to the naked eye
Early Wood/Late Wood Transitions	Abrupt
Color	Medium brown
Odor	None
Other features	A few tyloses present

Porosity Tests

Lab #:		Water Absorption by Total Immersion																					
Sample	0 min (dry weight)	Minutes																		1440	WAC		
Historic Brick	Mass (g)	54.99	65.56	65.61	65.67	65.61	65.62	65.55	65.69	65.79	65.84	65.82	65.73	65.7	66.46								
	Mat%	0	19.2167667	19.31900239	19.42171304	19.51260239	19.53070742	19.20548154	19.45000339	19.63993463	19.36715767	19.66448099	19.53002379	19.47626841	20.05033788	20.55834							
Modern Brick	Mass (g)	67.18	88.2	88.45	88.59	88.68	88.82	88.87	88.96	89.04	89.06	89.11	89.13	89.21	89.69								
	Mat%	0	1.166993118	1.486756137	1.617343427	1.720778114	1.88165405	1.938518009	2.041732696	2.133516862	2.156457903	2.21331051	2.236751549	2.328515715	2.879100711	2.879201							
Granite	Mass (g)	98.6	99.55	99.5	99.44	99.42	99.33	99.35	99.32	99.3	99.31	99.28	99.3	99.26	99.21								
	Mat%	0	0.063488844	0.042778905	0.051916978	0.031643902	0.740365112	0.760649007	0.730231324	0.709939148	0.68985517	0.709939148	0.66971197	0.618661258	0.953459								
Sandstone	Mass (g)	134.01	147.66	146.94	146.89	147	146.85	146.85	146.78	146.82	146.83	146.86	146.84	146.8	147.41								
	Mat%	0	10.18500703	9.648359692	9.611215043	9.69330647	9.581374524	9.581374524	9.529139616	9.558988135	9.641071562	9.66345795	9.573912395	9.544063976	9.990353787	10.18501							
*note total weight in grams (0.01g) and WAC																							



Mortar Analysis

Recorded Weights of Samples from the Jane Beale House, Sample #2

1. Weight of original sample:	8.43g
2.	
3. Weight of filter paper:	1.36g
4. Combined weight of dried filter paper and contents:	9.66g
5. Weight of the mass of the sand plus the clay minus the weight of the filter paper:	8.30g
6. Weight of first beaker:	166.74g
7. Weight of first beaker plus dried sand:	174.20g
8. Weight of the mass of sand:	7.46g
9. Weight of the mass of clay:	0.84g
10. Weight of the mass of lime:	0.13g
11. Volume of lime (divide mass by 60)	0.002167mL
12. Volume of sand (divide mass by 60)	0.1243mL
13. Volume of clay (divide mass by 90)	0.0093mL
14. Total volume	0.135793mL

Mass Percentages

Lime	1.54%
Sand	88.49%
Clay	9.96%

Volume Percentages

Lime	1.59%
Sand	91.54%

Clay





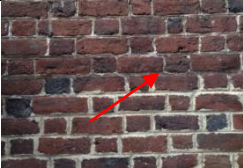

6.85%

Portland Cement Present on Filter?







No







Deterioration

Exterior




Symptom	Cause	Image	Location
Stone surface failure	Improper repointing with Portland mortar/moisture		East exterior foundation
Paint crazing and peeling	Moisture/exposure to weather		All exterior walls
Dry rot	Moisture from no gutter		Bulkhead weatherboard at the foundation
Dry rot	Moisture, possibly from leaking/clogged gutter		Junction of enclosed porch and west wall
Mortar loss	Poor repointing with smear technique/exposure to weather		South exterior wall, east of bulkhead
Splashback	Water overflow from clogged/leaking gutter		West exterior wall, north of enclosed porch

Basement



Symptom	Cause	Image	Location
Stone surface failure	Improper repointing with Portland mortar/rising damp		Throughout basement foundation
Stone surface failure	Improper repointing with Portland mortar/moisture-impervious paint/rising damp		Basement foundation, north room
Brick failure	Hard mortar/rising damp (Possibly overflow from exterior concrete drain)		Chimney stack, north room in basement
Brick failure	Hard mortar/rising damp		Bulkhead stairs
Dry rot	Moisture from no gutter		Bulkhead sill
Staining/white rot	Moisture/rising damp/poor drainage (Possible standing water)		Post, north room in basement



Staining/white rot/dry rot	Moisture/rising damp/ poor drainage (Possible standing water)		Coal bin, north room in basement
Staining	Void in foundation/moisture		Joist, south room in basement, east side, near north window
Staining/white rot	Moisture at junction with house/leaking pipes		Basement bathroom, northeast corner
Staining	Rising damp/concrete floor/moisture		Basement foundation, north room
Spalling plaster	Moisture from rising damp/poor bond with substrate		Basement bathroom, north wall
Spalling plaster	Poor bond with substrate		Party wall, basement, above stairs

First Floor

Symptom	Cause	Image	Location
Paint cracking and bubbling	Poor substrate preparation		Interior of south front doors
Cracking plaster	Thermal expansion		Throughout first floor
Cracking wainscoting	Thermal expansion/moisture related expansion		Southeast room

Second Floor

Symptom	Cause	Image	Location
Dry rot	Moisture		Floor, south room, southwest corner
Dry rot	Moisture		Floor, hallway

Cracking paint/separation of panel from mantelpiece	Sealed junction preventing thermal/moisture-related expansion		Mantelpiece, south room
Floor deflecting	Masonry party wall beneath floor		Hallway

Test Results

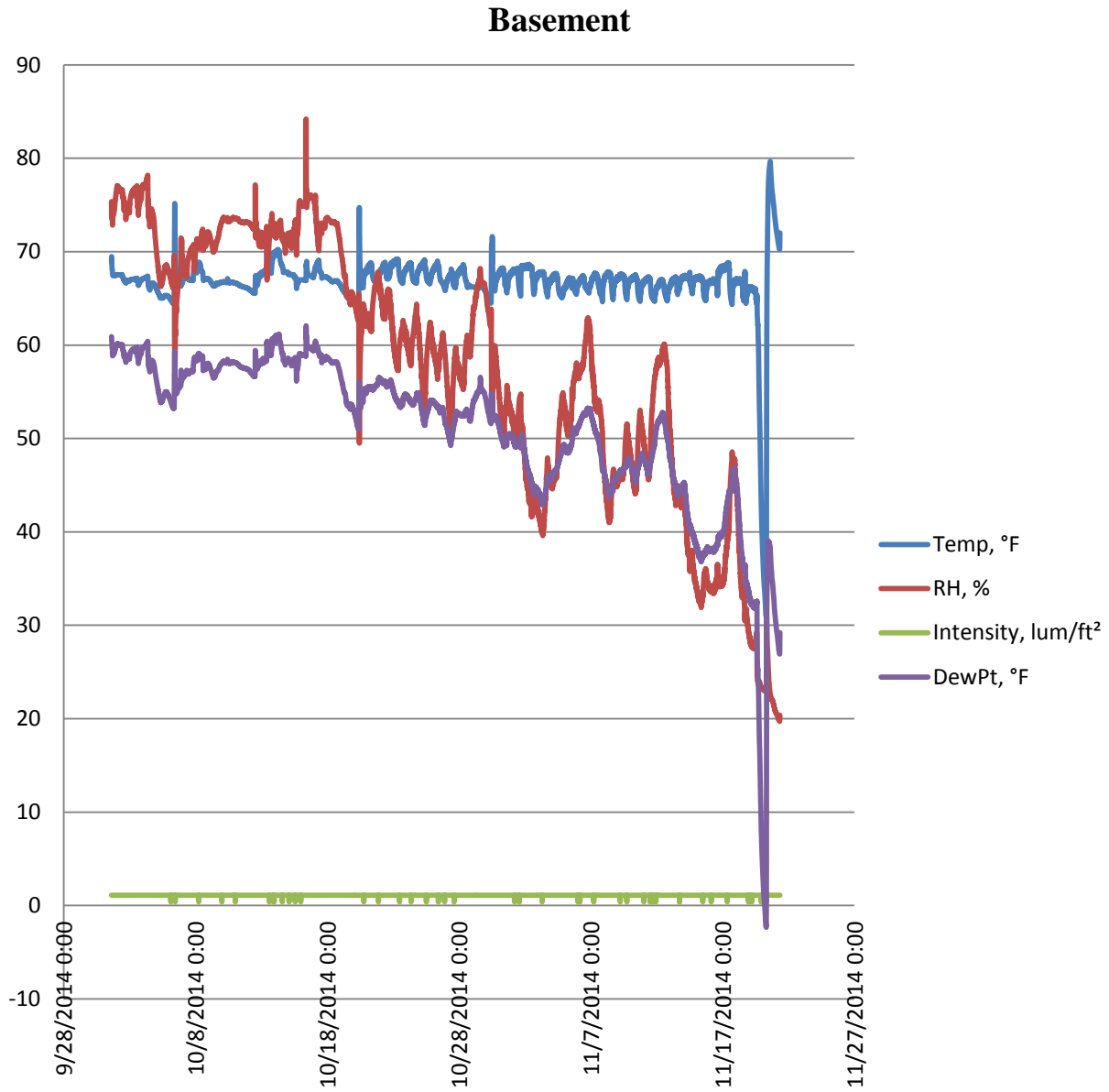
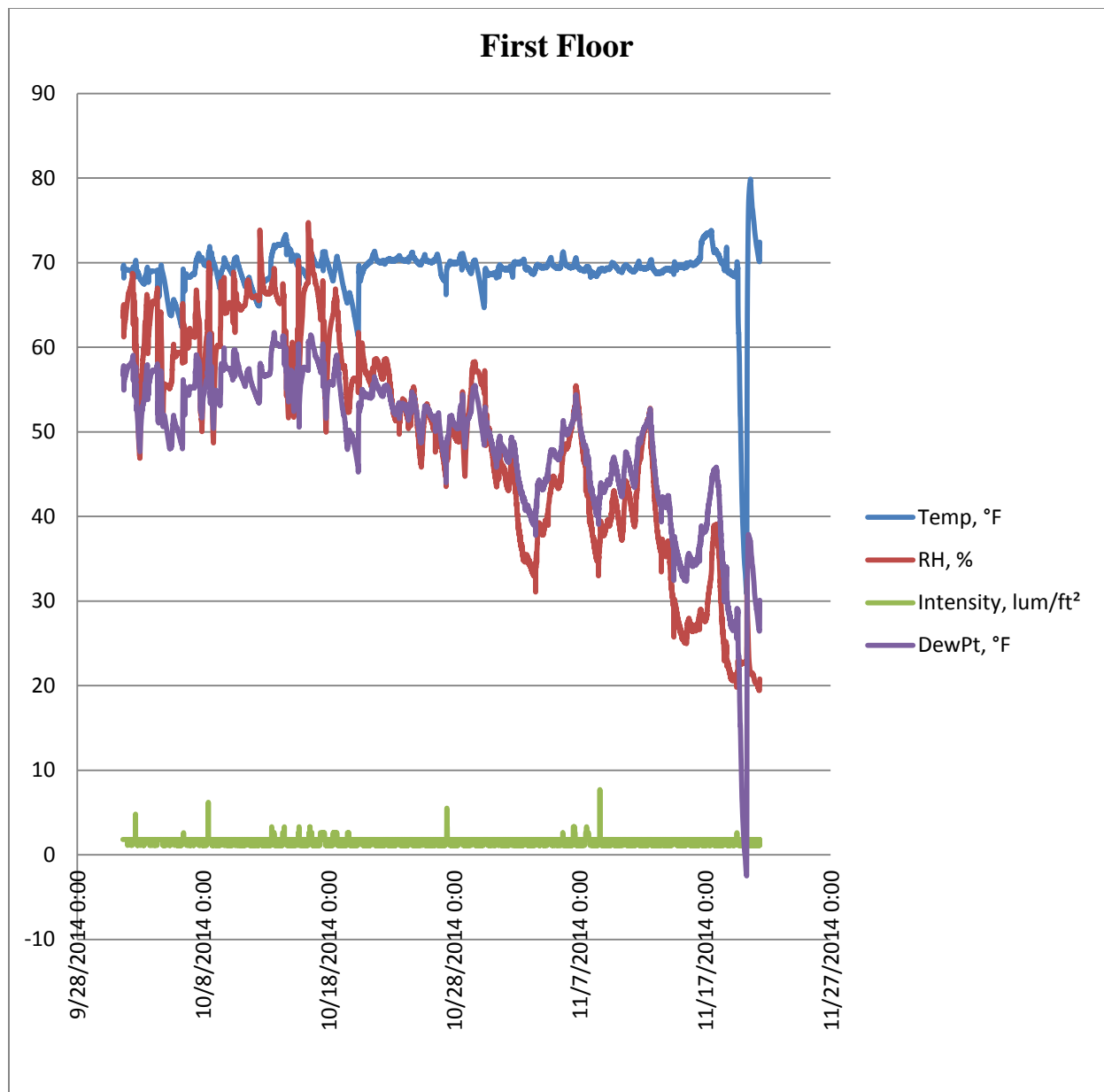
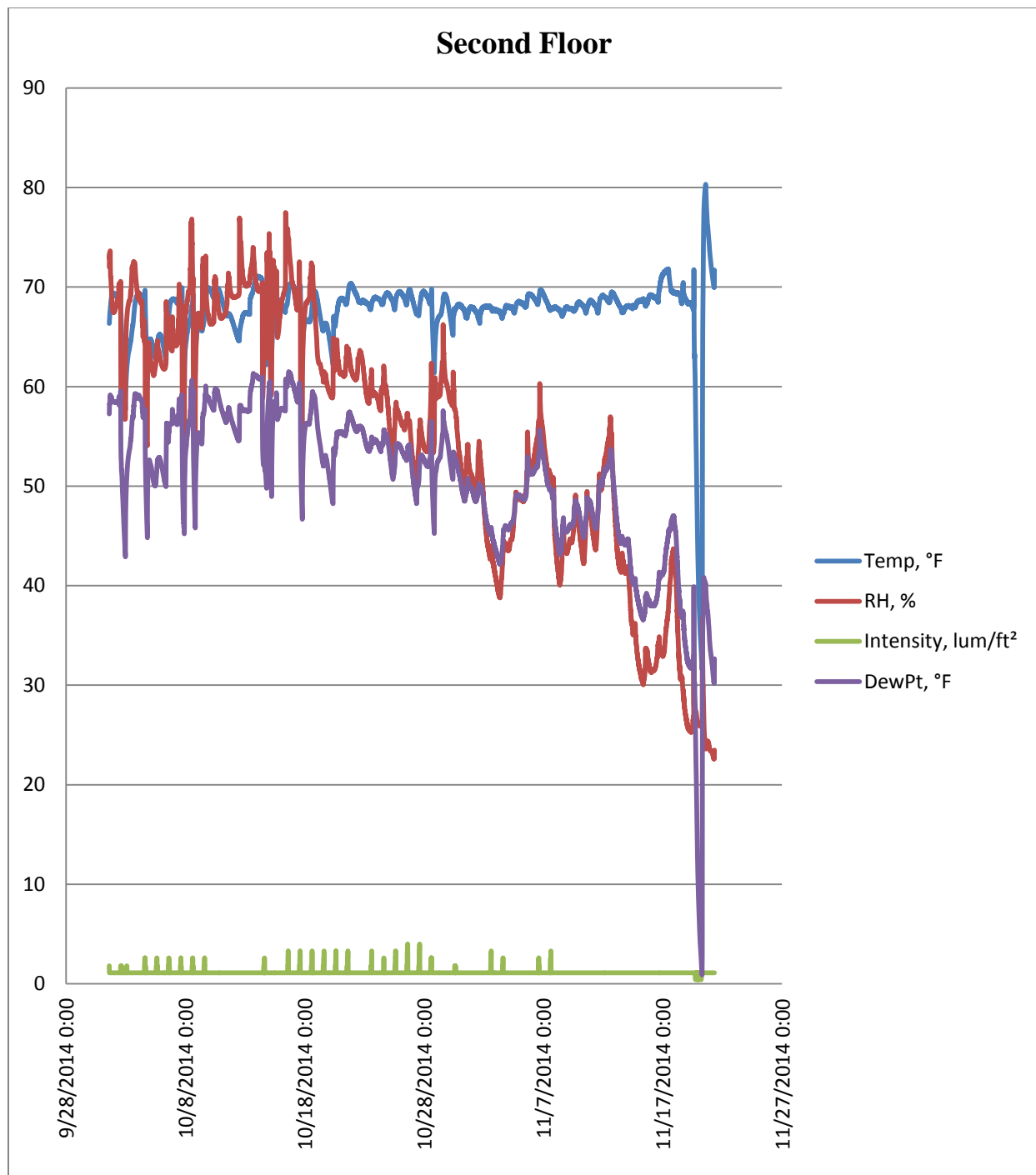
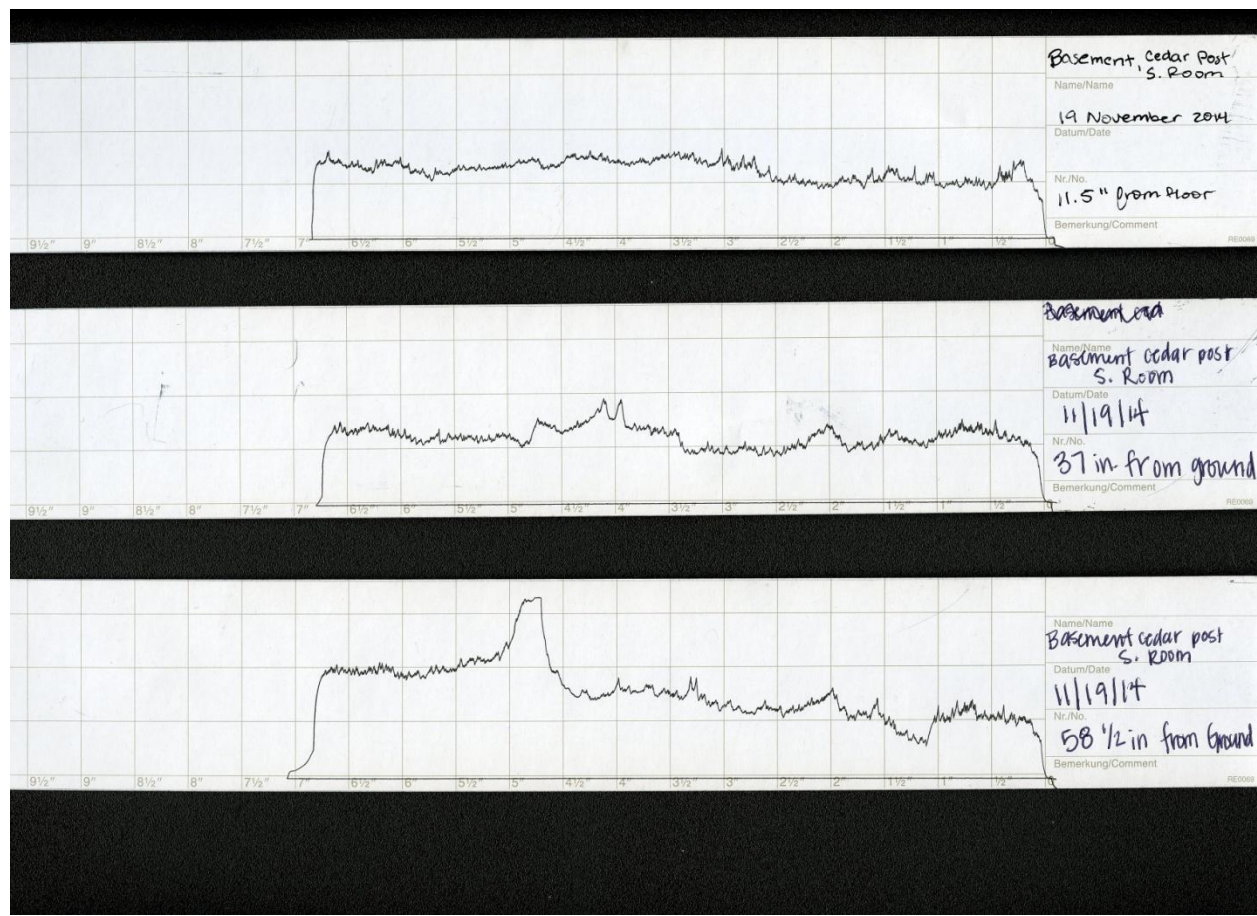


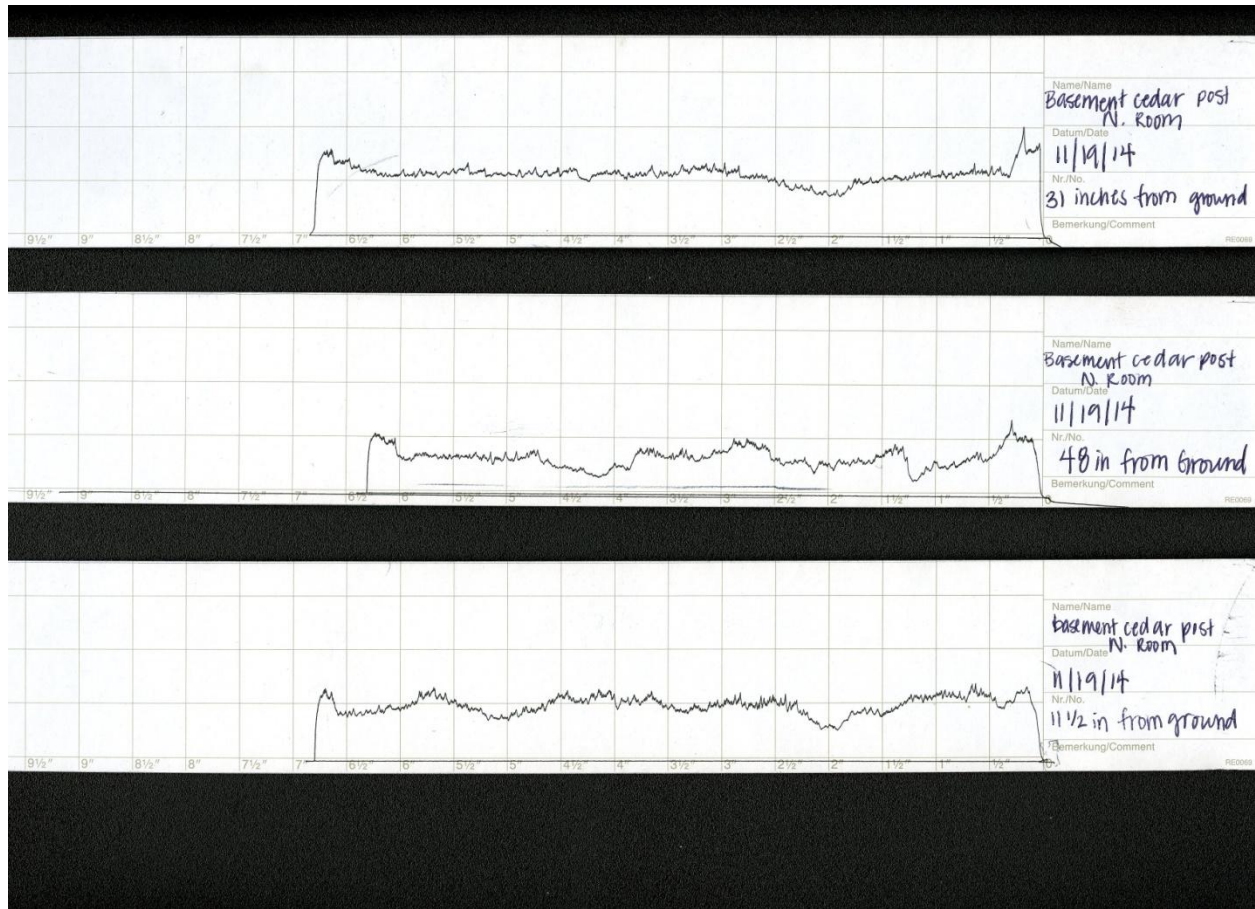
Figure 25 shows the data logger results for the basement.



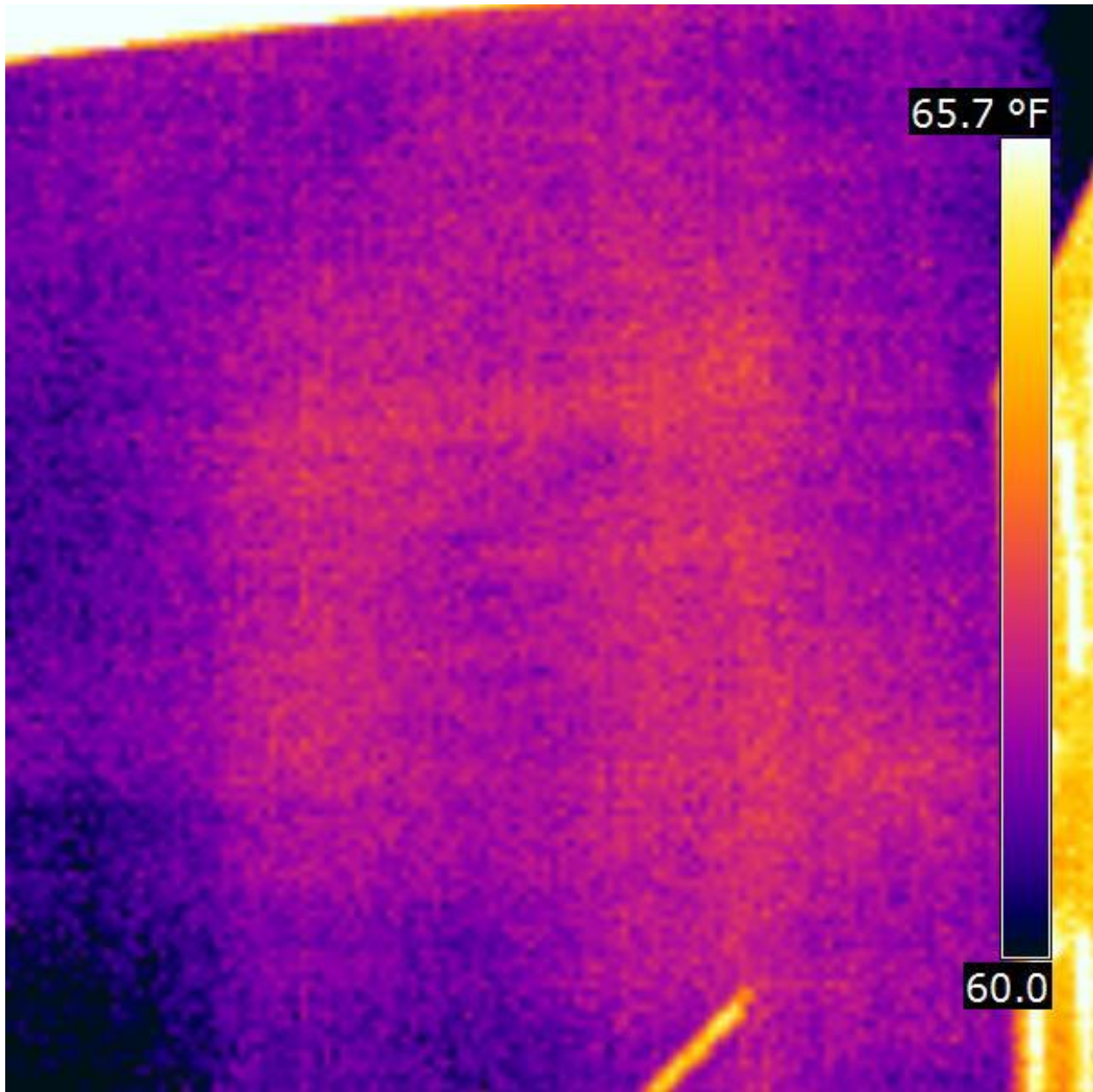




The resistance drill tests for the post in the south room show that the wood is not deteriorated.



Similarly, the post in the north room is also not deteriorating.



This infrared image shows of the south wall the location of the original entrance to the dwelling. Infrared images of the building showed that there were no areas of moisture damage or rot.