Project 400: The Plymouth Colony Archaeological Survey

Public Summary Report on the 2015 Field Season

Burial Hill, Plymouth, Massachusetts

Christa M. Beranek, David B. Landon, John M. Steinberg, and Brian Damiata, editors
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University of Massachusetts Boston
Andrew Fiske Memorial Center for Archaeological Research

Cultural Resource Management Study No. 75a

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Other *Project 400* Reports

D. B. Landon and C. M. Beranek, editors
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2015 Project 400: The Plymouth Colony Archaeological Survey Report on the 2014 Field Season, Burial Hill, Plymouth, Massachusetts. Andrew Fiske Memorial Center for Archaeological Research Cultural Resource Management Study No. 70.

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Abstract

Please note: this is a redacted and shortened public summary of the technical report on the 2015 field season. Researchers who would like to access to full version of the report can view it at the Massachusetts Historical Commission or can contact the Fiske Center. Changes made in the public summary include redaction of unit locations, redaction of some artifact discussions, shortening of several stratigraphic and technical discussions, and removal of the appendices (artifact catalog, supplementary geophysical images, and data on Native ceramic fragments). The full technical report contains additional images and data tables. If this summary report is cited, please cite it as Project 400: The Plymouth Colony Archaeological Survey, Public Summary Report on the 2015 Field Season, Burial Hill, Plymouth, Massachusetts. University of Massachusetts Boston, Andrew Fiske Memorial Center for Archaeological Research Cultural Resource Management Study No. 75a.

In May and June of 2015, a field school from the University of Massachusetts Boston, in partnership with Plimoth Plantation, undertook a third season of work in Plymouth, Massachusetts, as part of Project 400: The Plymouth Colony Archaeological Survey, a site survey and excavation program leading up to the 400th anniversary of New England's first permanent English settlement in 1620, the founding of Plymouth Colony. This work was conducted under permit #3384 from the State Archaeologist's office at the Massachusetts Historical Commission. The 2015 work focused on the eastern edge of Burial Hill along School Street in downtown Plymouth where we excavated 13 shovel test pits and 8 excavation units. We also carried out geophysical survey on two additional parcels in downtown Plymouth using ground penetrating radar and frequency-domain electromagnetics.

Burial Hill, formerly Fort Hill, is understood as the location of the original fort built by the English colonists, and the walls that enclosed the fort and town stretched down the hill towards the harbor. The precise locations of any of these features have never been archaeologically identified. In the 18th and 19th centuries, the land on the eastern edge of the hill along School Street was sold to individuals who built houses and stables, all demolished by the early 20th century. Our test excavations were designed to see if any 17th-century features or deposits existed either under the floors of these buildings or in the strip of land between the backs of the buildings and the burials, which begin roughly 20 meters from the street. During the 2014 season, we placed excavation units on the eastern edge of Burial Hill along School Street, in the middle of the block. All of the features and deposits uncovered during 2014 were related to the 19th-century buildings along this section of School Street. During the 2015 season, we excavated STPs north of our 2014 project area and excavation units to the south of the 2014 project area.

The 2015 season reinforced some of the conclusions that we made based on work in 2014, but also yielded several areas with early intact deposits. As we found in 2014, the large school and stable buildings cut deeply into the hillside, removing any earlier deposits within their footprints. In a number of cases the construction or demolition deposits continued well behind the building foundation walls. However, there are areas behind (west of) those buildings where early deposits are preserved. EU11 located an intact Native deposit, possibly from a Woodland period tool making workshop. This excavation unit is significant because it adds a Native component to Burial Hill, a National Register property.

The other preserved early deposit is a section of a potential 17th-century pit or trench identified in the westernmost portion of EU14. This deposit contained Native ceramic fragments and corroded metal, possibly pewter or solder. The presence of this feature and a small number of 17th-century artifacts in the fill deposits above it (including Border ware and a marked smoking pipe) suggest that the units at the southernmost end of School Street fall within or near the 17th-century settlement core, since we did not find comparable numbers of early artifacts in units to the north in 2014.

ACKNOWLEDGEMENTS

We would like to thank the Town of Plymouth for their support and permission to conduct excavations on this significant site. Thanks also to Plimoth Plantation for their support, including allowing the field crew to stay on their property. We would like to acknowledge the hard work of our field crew, TAs Kellie Bowers and Justin Warrenfeltz; the survey team Eric Johnson and Richie Roy; students Joe Trebilcock, Ramona Steele, Katie Wagner, Blaine Borden, Elizabeth MacDonald, Ashley Corbeil, Annie Greco, Peter Leyden, Anya Gruber, Kerri Knigge, Laura Marques-Jackson, Emily Williams, and Lauryn Poe; and volunteers Bill Knowles and Karen Wenner. Many of these students also contributed to the laboratory processing and analysis with additional work by Nadia Waski, Leigh Kozarsky, and Caroline Gardiner. The artifact photographs are by Melody Henkel; several of the maps were drafted by Jared Muehlbauer.

Frontispiece. The 2015 archaeological field school crew.

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Introduction

In May and June of 2015, a field school from the University of Massachusetts Boston, in partnership with Plimoth Plantation, undertook a third season of work in Plymouth as part of Project 400: The Plymouth Colony Archaeological Survey, a site survey and excavation program leading up to the 400th anniversary of New England's first permanent English settlement in 1620, the founding of Plymouth Colony. It is our objective to add a scholarly perspective to the discussion around this significant milestone. The goal of this phase of the project is to identify parts of the 17th-century palisade wall that encircled the fort and encompassed the original colonial Plymouth settlement, or to find some features of the settlement itself. Since the 17th-century settlement in under the modern downtown, we expect that areas of preservation will be discontinuous and may be small. The project is directed by David Landon, of the Andrew Fiske Memorial Center for Archaeological Research at UMass Boston, with the assistance of Christa Beranek, John Steinberg, and Brian Damiata. Undergraduate and graduate students working on the project were enrolled in a UMass Boston field course; several volunteers from the community joined the fieldwork. The project had permits from the State Archaeologist's office at the Massachusetts Historical Commission (permit #3384) and from the Town of Plymouth Department of Public Works.

This season's work was focused on Burial Hill in downtown Plymouth, testing areas along School Street both north and south of the 2014 project area. The property belongs to the Town of Plymouth, and we worked in a strip of land between the street and the historic burials (Figs. 1 and 2), excavating 13 shovel test pits and 8 excavation units. We also did geophysical survey at two other locations in downtown Plymouth (Fig. 3), one of the first steps in identifying other possible excavation locations. Significantly, this year we identified two areas where early deposits have been preserved on Burial Hill. One area contained part of a 17th-century feature (a segment of a small pit or trench); the other contained intact deposits from Native American occupation of Burial Hill.

The fort atop Burial Hill (formerly Fort Hill) was established during the first years of the Plymouth colony, and the village and palisade ran down the hill towards Plymouth Bay. The fort was used for the town's defense through the time of the King Phillip's War in the 1670s. Afterward, the hill became a burial ground with gravestones dating back to the 1680s. We purposefully avoided disturbing any of the historic graves and monuments on Burial Hill, which was listed on the National Register of Historic Places in 2013. Although the general location of the fort at the top of the hill and the outlines of the palisade wall can be estimated, their exact locations are unknown. In the 18th and 19th-centuries a series of buildings were situated along School Street. The buildings included houses, two schools, and several large stables and warehouses. These were removed in the late 19th and early 20th centuries, starting with the most southern buildings and moving northward. The southernmost building on School Street

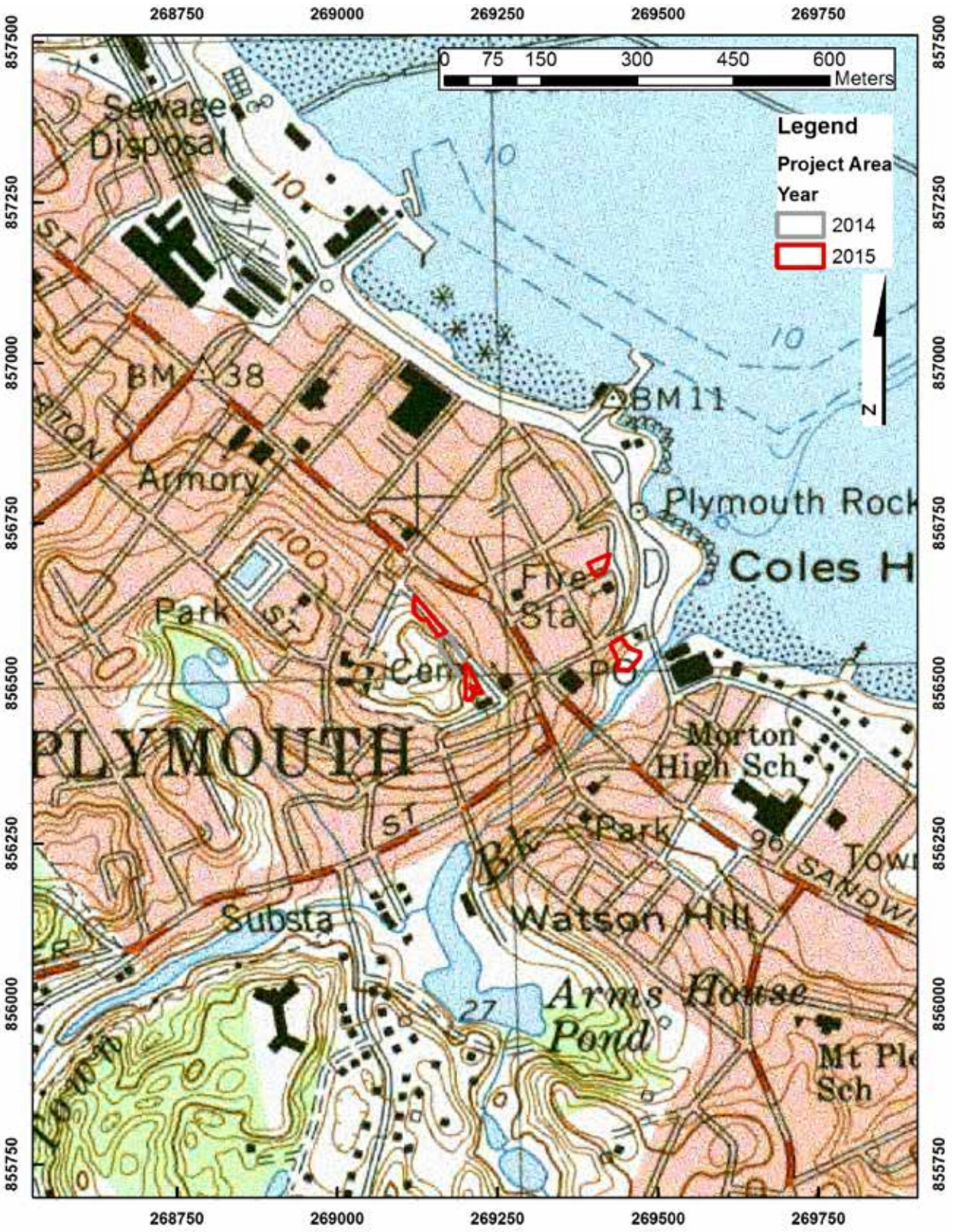


Figure 1. The 2014 and 2015 project areas on Burial Hill along School Street in Plymouth, MA, on the USGS 7.5 minute series quadrangle map.

Figure 2. Work at the south end of School Street.

was the town owned, 18th-century school, constructed in 1765 and demolished by 1882 (Davis 1899: 288-289). This building is labeled "Engine House" on the 1874 Beers map (Fig. 4), reflecting its last use. The next buildings to the north on the 1874 map, labeled "Livery Stables" were buildings last owned by Zenas F. Leach. Leach sold the land and buildings, described as "old stable buildings" to the town in 1884 (PCRD 503: 102), and the buildings must have been demolished shortly thereafter since they are absent from the 1885 Sanborn map (Fig. 5). The main 2015 excavation units were located in and behind the 1765 school and Leach's buildings. Further north, the parcels were gradually acquired by an organization called the Stickney Fund which demolished the buildings and later turned the land over to the Town of Plymouth. We tested parts of this area in 2014, and in 2015 conducted a shovel test pit survey north of the 2014 project area, along the northern portion of School Street up to the intersection with South Russell Street. The removal of these buildings created an open grassy area along School Street that gradually rises moving west up Burial Hill. Headstones for marked burials start about 20 m (60 ft) from the current edge of School Street.

Research Questions

The ultimate goal of the project is to find and interpret archaeological deposits related to the 17th-century palisade wall that encircled the fort and encompassed the original colonial Plymouth settlement, to find some features of the settlement itself, and to reinterpret existing 17th-century collections held by Plimoth Plantation and other heritage organization. Under this goal, we have three research questions relating to the 17th-century: 1) How was space defined to create an English colonial landscape?; 2) What are the environmental context and ecological consequences of the Plymouth Colony settlement?; and 3) What are the material dimensions Colonist-Native interactions? Although our ultimate goal is to locate 17th-century features and deposits to answer these questions, we are interested in all of the subsequent time periods as well. In particular, we want to understand the landscape changes that took place as Plymouth developed into an urban center and the way in which preservation decisions have been made throughout Plymouth's history, frequently affecting the preservation or demolition of older buildings and landscapes.

The 2015 fieldwork also had a series of more specific research questions, aimed at locating the kinds of deposits useful for answering our broader research questions. We continue to use geophysical survey and test excavations to assess the nature, chronology, and integrity of the archaeological deposits on this area of Burial Hill, building on our 2014 results. An important goal of this project is to continue to evaluate the effectiveness of shallow geophysical methods and refine our abilities to interpret the geophysical data we collect. One basic goal is to determine the radar signatures that may be associated with burials by including areas

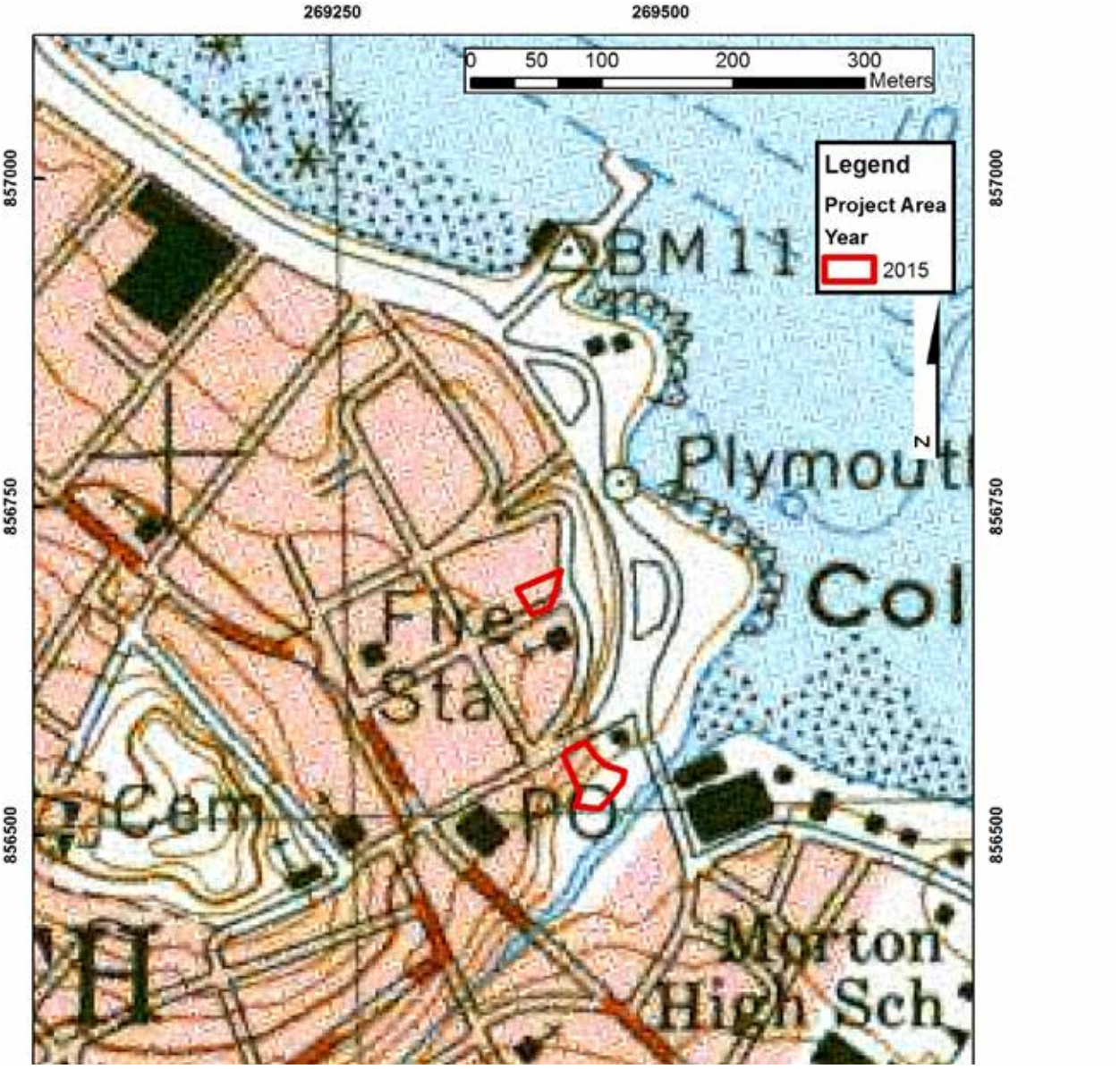


Fig. 3. Geophysical survey areas at Brewster Gardens and a lot owned by the Pilgrim Society at the end of Middle Street.

of marked burials in the geophysical survey. In a broader sense we also want to expand our ability to understand the strengths and limitations of geophysical data for mapping the subsurface of Burial Hill. What types of features are apparent in the GPR, and how do these match the known archaeological record? What are the limitations of the method for the given environment? How can the GPR survey be designed to maximize data collection and interpretation on Burial Hill? To answer these questions we undertook geophysical survey in this area of Burial Hill and followed it with excavations in the survey area to ground-truth the geophysical results. In 2014, we found that GPR was effective in positioning excavation units that crossed buried the stone foundation walls of 19th-century buildings.

For the excavation component of the work we have a series of specific research questions about the nature, extent, integrity, chronology, and significance of the archaeological deposits in these areas of Burial Hill. Specifically, what types of sub-sur-

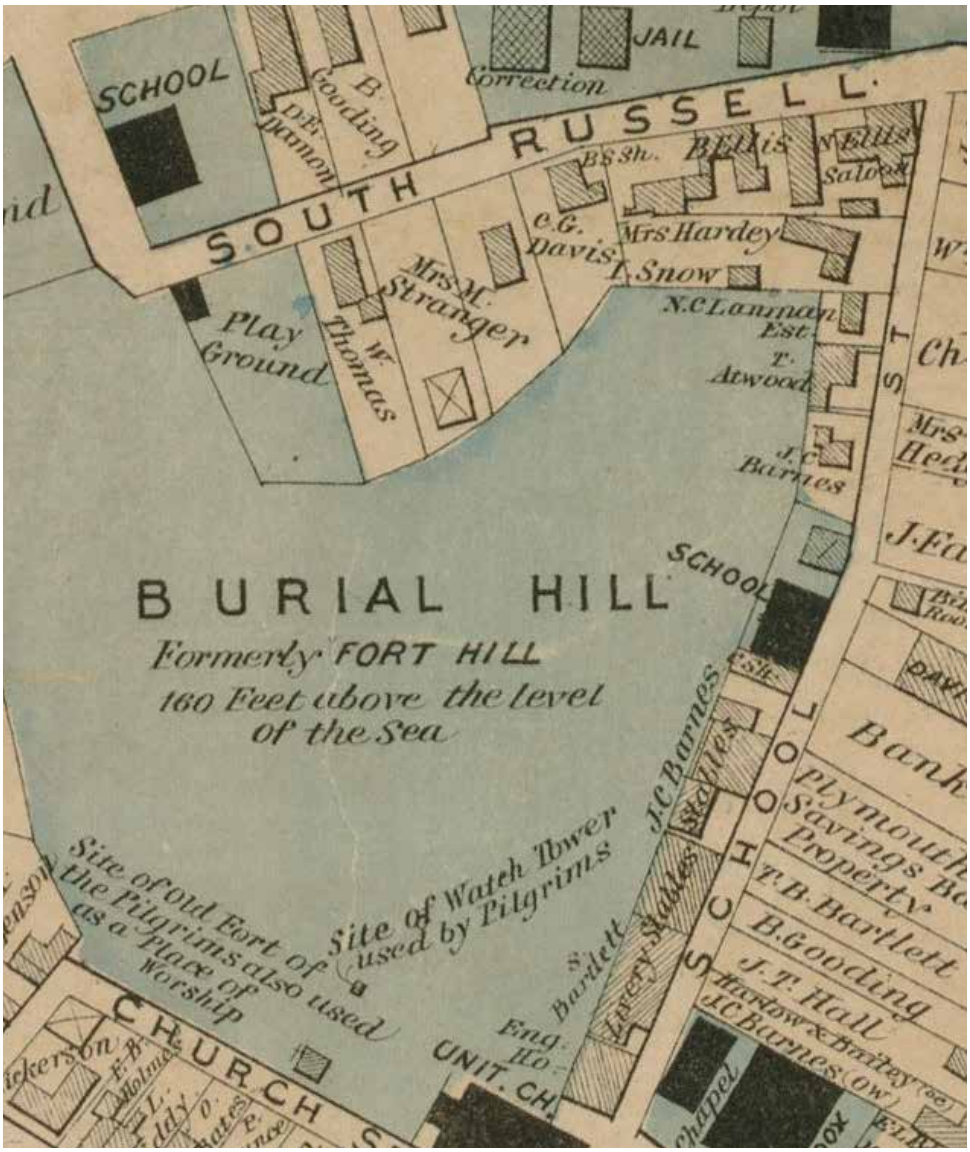


Figure 4. Detail of School Street on the 1874 Beers map of Plymouth.

face sediments and archaeological deposits exist in the test area? What is the date range and artifact content of the site sediments? What types of natural and cultural depositional processes are reflected in the site record? How has recent urban renewal and the removal of historic structures (Goldstein 2007) altered the archaeological record? Does any evidence of the earliest settlement of the Plymouth Colony survive in any of these developed areas? How does the record of site sediments, artifacts, and features, correlate with the shallow geophysical data?

Burial Hill History and Archaeological Sensitivity

The project area is considered to have very high archaeological sensitivity, and as we had found in 2014, every shovel test pit and excavation unit in 2015 recovered artifacts. Burial Hill is already on the National Register of Historic Places and is a complex and historically significant cemetery (Berg and Friedberg 2012) covering 5.12 acres with at least 2269 gravestones from 1681 to 1957. The test area for excavation in

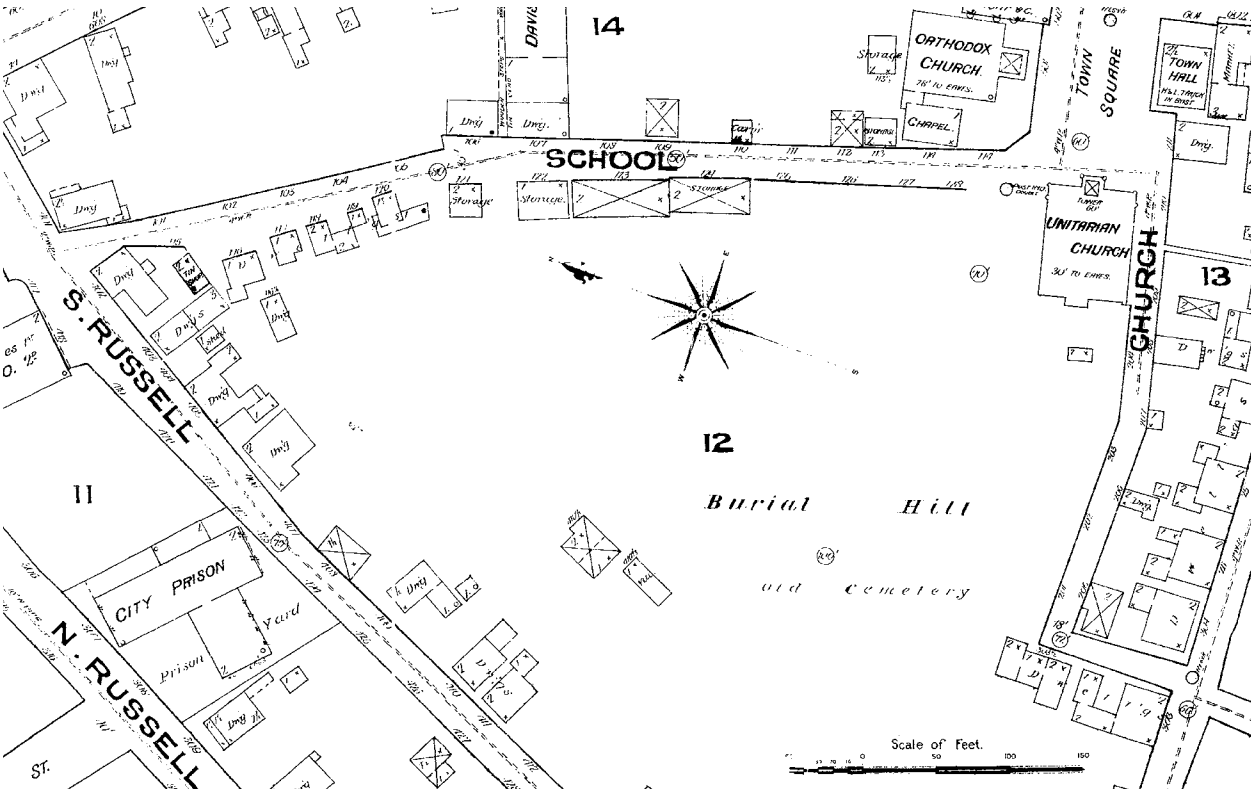


Figure 5. Detail of School Street on the 1885 Sanborn map of Plymouth.

2015 was along the western side of School Street, outside the limits of the historic burials, in an area that was previously developed with a series of buildings along the road that were torn down as part of cleaning up and expanding Burial Hill at the beginning of the 20th century. The 2015 test areas were both north and south of the 2014 project area, encompassing a former residential area north of the long-standing path up Burial Hill in the middle of the School Street block and the very southern end of the block. The John Alden house site monument is within the 2015 project area and reportedly marks the site of John Alden's house while he lived in Plymouth. Thus the 2015 excavations had the potential to uncover a variety of historical archaeological deposits and features from the 17th through 19th centuries, including the earliest periods of Colonial settlement.

Prior to our 2015 excavation, there were no know Native sites on Burial Hill; however, the environmental setting and proximity to other identified sites in downtown Plymouth suggests the potential for ancient Native artifacts or features. The original colonial settlement of Plymouth was located on top of the Late Woodland site of Patuxet (Bragdon 1996), situating it under unknown areas of modern downtown. Our plan, if we identified ancient Native features in our excavations, was to record them in the unit in which they were encountered, but not to expand any excavation units to excavate additional area covered by Native features. We did find one area of intact Native deposits, possibly representing a lithic workshop, with additional small pieces of Native ceramic. We also found Native material redeposited in other contexts, including a significant concentration of flakes and tools in EU10.

General History of Burial Hill

Plymouth Colony and Fort Hill, 1620–1681

On December 22nd, 1620, after two months of traveling across the Atlantic – and over a month exploring the Massachusetts Bay area – colonists finally chose a location for their Plymouth Colony. The core of the fortified settlement was to be

centered on the most substantial hill in the area. The Wampanoag village of Patuxet had once been sited on this very hill as recently as 1617. In that year, an epidemic decimated the native population, and the village was not inhabited when the English colonists arrived. The area would soon come to be known as Fort Hill. In addition to easy access to nearby fresh water and high-quality lumber, the colony's placement allowed colonists to more easily defend the town from potential attacks originating from Plymouth Harbor. Originally, the town was defended only by a wooden stockade with ordnance mounted upon it, which was constructed in December 1620 (Deetz and Deetz 2000: 57-70; Heath 1963: 17-21).

During these first few months in the harbor, colonists were still living aboard the Mayflower. With the steadily advancing winter, construction on the colony's first dwelling houses "in two rows…for more safety" and common building began on January 9th, 1621. Edward Winslow describes that, by December of that year, seven dwelling houses had been constructed for the nineteen families at Plymouth, in addition to four common buildings meant for storage. On February 17th, 1621, the colonists appointed Miles Standish as their captain. Soon after, they began construction on a palisade to encircle and protect their town. This palisade would be improved upon in June of 1622 and other fortifications completed ten months later, in April of 1623 (Heath 1963 18-37; Morison 1952:111).

In 1623, Englishman John Pory visited the colony, remarking on the "substantial palisade about their [town] of 2700 foot in compass, stronger than I have seen any in Virginia" (James 1963: 11). This would suggest that palisade improvements were well on their way to completion. Also visiting Plymouth in 1623, Englishman Emmanuel Altham reported that the colony had grown to include about twenty houses, all still contained within the fortified settlement atop Fort Hill (James 1963: 24).

With the Colony's growth came the increasing demand for land. The town responded to this demand in 1627 by allotting land outside the palisade to families for private use at a rate of one acre per individual (PCR 12:4-6). In that same year, Dutch explorer Isaack de Rasieres visited the town of Plymouth. In a letter recounting his experience, Rasieres described the fortified Plymouth colony in amazing detail. He included descriptions of the palisade, the layout of the streets and gates, and the watch-house that defended the town (James 1963:76). But by 1628, colonists began to permanently relocate outside of palisaded Plymouth in search of land they could cultivate for their own use (Morison 1952:253).

Between 1630 and 1635, the fort underwent extensive repairs and expansion, and it was expanded again in 1642. In 1643, a brick watch tower was built adjacent to the fortified town. In 1676, in response to growing hostilities associated with King Philip's War, reconstruction efforts again focused on the Plymouth palisade on Fort Hill. Colonists constructed a two-story square fort, 100 feet on a side, mounted with three large pieces of ordnance and palisades ten-and-a-half feet high. Once King Philip's War ended in 1677, the palisade encircling the central Plymouth settlement was finally torn down permanently, with the lumber being sold to William Harlow, who used it to build his home (Perkins 1902:9-11).

Despite these several firsthand accounts, as well as a rudimentary map drawn by William Bradford himself, the exact placement of the original fortified settlement is unknown. To date, no architectural remains of these buildings or fortifications constructed between 1620 and 1676 have been verified, and the exact location and layout of the town remain hotly-debated topics. Traditional accounts place the pinnacle of the fortified settlement atop modern-day Burial Hill, with a commanding position overlooking Plymouth Harbor. These accounts also cite Leyden Street as the primary axis along which the settlement was placed, with the perpendicular axis extending outward from Main Street. Leyden Street was the first road established in the Plymouth settlement, and its modern-day extent runs southwest from Plymouth Harbor to Main Street, becoming Church Street and running along the southern boundary of Burial Hill.

Town of Plymouth and Burial Hill, 1681–1722

Shortly after the dismantling of the palisade,

Plymouth colonists began burying their dead on Fort Hill. The earliest surviving evidence of this practice is the slate headstone of Edward Gray, who died in 1681. Judge Sewall would be the first to refer to the area as a burial place on March 10, 1698 (Davis 1899: 130). Deeds in the late 18th and early 19th centuries refer to it both as Fort Hill and later as the Burying Hill. Popular belief holds that, prior to 1640, the dead were buried at nearby Cole's Hill, named after the land's original owner, James Cole. Despite this strong local tradition, it is unknown for certain where the colonists were buried between 1640 and 1680. Some have posited that individuals were likely buried on their own estates in private lots, a practice with clear English antecedents (Davis 1899: 130; Perkins 1902: 11).

Four 17th century grave markers still survive today on Burial Hill, concentrated at the crest of the hill. The earliest of these headstones belongs to Edward Gray, a wealthy merchant and deputy to the General Court in Plymouth who died in 1681. William Crowe (d. 1683/4), Hannah Clark (d. 1687), and Thomas Clark (d. 1697) are the others (Berg and Friedberg 2012: 6-7, 14). Other 17th century burials likely exist in this location, with the grave markers being lost in the last three centuries.

Burial Hill and private ownership, 1722–1894

Ownership of the core of Burial Hill has always been retained by the Town of Plymouth. However, in 1722, the Town began selling off parcels of land on the northern and eastern boundaries of Burial Hill, along present-day South Russell and School Streets, with most initial public sales of Town land on Burial Hill taking place between 1775 and 1825 (Davis 1899: 289). Over the next two centuries, parcels of land along the Town's burying ground changed hands frequently. With Nathaniel C. Lanman's 1840 purchase of a small parcel near the northeastern corner of Burial Hill, the majority of land adjacent to the cemetery was in private hands (PCRD 171: 29).

It was not until 1757 that some effort was made to protect the central part of Burial Hill – and its burials – from livestock using the Hill as pasture land. This likely reflected a broader emerging sensibility amongst New Englanders of the sacred nature of cemeteries, which had largely been used as meadowland in the century prior. In that year, Rev. Chandler Robbins petitioned the Town to fence the burial ground primarily to keep out grazing horses, whose hooves had exacted a costly toll on the burial ground's headstones (Goldstein 2007: 103). The fence was finally installed in 1782, and in 1800, Rev. Robbins successor – Rev. Dr. Kendall – finally succeeded in garnering Town support to ban horses from the now-enclosed Burial Hill. It is reasonable to assume, therefore, that horses freely roamed the Hill prior to this date (Davis 1906: 324-325).

Most of the lots along South Russell Street and the northern part of School Street were residential. School Street took its name from a grammar school, sometimes referred to as the central school, established in 1765 north of the Unitarian church at the south end of the street (the lot labeled "Engine House" in Fig. 4). A second school, sometimes called the "town school" was established in the middle of School Street, just south of the path up to Burial Hill, after the Central School District purchased a plot of land in 1826 (Davis 1899: 286, PDRD 156: 288). This lot is still labeled as "School" on the 1874 Beers map (Fig. 4). South of this school, the properties were primarily barns and stables, many of them built by landowners living on the opposite side of School Street from the cemetery. School Street was originally a pathway cleared by these owners as a way to more easily gain access to their stables (Davis 1899: 286). Late 19th-century maps illustrate the use of the area. The specific details of these lots are discussed further below.

Many of the commercial parcels along School Street were owned by the same individual or family for long stretches of the mid-19th-century, implying a period of stability. In the 1860, and increasing in the following decades, these parcels started to change hands more rapidly. In the late 19th century, the lots along School Street began to move out of private ownership and were reacquired by the town in several ways. It was during this transition that the residential and commercial buildings along School Street were demolished creating the grassy edge of Burial Hill that exists today. The first transfer of land back to the

town was the sale of three lots north of the Engine House lot by Zenas F. Leach in 1884 (PCRD 503: 102). He sold these lots to the town for $1, with "the old stable buildings thereon." These buildings and the Engine House were demolished by the time the 1885 Sanborn map was drawn. The rest of the lots were acquired by the Stickney Fund, the buildings were demolished, and the land eventually transferred to the town.

Burial Hill and the Stickney Fund, 1894 – 1935

In 1894, the General Court of Massachusetts passed an Act to incorporate six prominent Plymouth figures in a collective known as the Trustees of the Stickney Fund (GCM 1894: 308). Joseph Henry Stickney, born in West Brookfield, Massachusetts, in 1811, was a successful businessman and founder of Stickney Ironworks in Baltimore. Though he relocated to Maryland in 1834 and lived in the area until his death in 1893, he maintained strong ties to the Massachusetts area, visiting Plymouth annually in his later years. Henry, as he was known, was descended from William Stickney, an early settler of Massachusetts and member of the First Church of Boston in 1638 (Henderson 1896: 13). Upon his death, Henry willed over $1 million to various benefactors, which today would be worth close to $30 million (NYT 1896). To the Trustees of the Stickney Fund, Henry left more than $75,000 (NYT 1893).

Stickney had designs for several commemoration projects across the Plymouth area. This included building a wall around the Standish monument, placing a monument on Clark's Island in honor of the Pilgrims' first Sabbath celebration, beatifying Cole's Hill, and removing the canopy from Plymouth Rock. Additionally, Stickney allotted $10,000 to allow the Stickney Fund to purchase land adjacent to Burial Hill and convey that land back to the Town of Plymouth. This was so that the area around Burial Hill could be preserved in perpetuity as a monument to the first colonists of Plymouth (PCRD 1576: 400; 1681: 121).

The six Trustees of the Stickney Fund were: John D. Long, President of the Pilgrim Society of Plymouth; Charles B. Stoddard, Treasurer of the Pilgrim Society of Plymouth and President of Plymouth National Bank; William S. Danforth, Secretary of the Pilgrim Society of Plymouth and President of Plymouth Savings Bank; William S. Morrissey, President of Old Colony National Bank; Arthur Lord, Chairman of the Selectmen of the Town of Plymouth; and Benjamin W. Harris, Plymouth County Probate Court Judge (GCM 1894: 308). These Trustees held annual meetings for most years from 1897 to 1929, when the Trustees voted to formally dissolve. In addition to annual meetings, the Trustees also held a number of special meetings as needed. These meetings consisted mostly of votes to release funds for purchase of parcels of land once negotiations with landowners had finalized.

The Stickney Fund was not formally dissolved until 1935, by which time the Fund had spent more than $77,000 on projects. J. Henry Stickney had also included provisions in his will that the Fund was to invest $10,000 in repairs and to establish an endowment for Pilgrim Hall. By 1935, that money had grown to more than $25,000, and in that year was formally turned over to Pilgrim Hall. Many of the Fund's papers are in the archives at Pilgrim Hall.

The Stickney Fund's first purchase in 1897 was a parcel of land owned by Martha Stoddard (PCRD 739: 529). By 1918, they had purchased ten lots adjacent to Burial Hill, mostly along the boundary with School Street (Fig. 6). These same ten lots were conveyed by deed to the Town of Plymouth in 1929 (PCRD 1576:398-400). It is likely that any structures on Stickney land were demolished during this period of ownership to beautify Burial Hill in preparation for the tercentenary celebrations in Plymouth in 1920 (Fig. 7).

Indeed, the 1874 Beers map (Fig. 4) indicates a number of structures along the northern and eastern edges of Burial Hill, but by the time the land was conveyed to the Town in 1929, Sanborn maps indicate no standing structures (Fig. 8). The Stickney Fund purchased an additional two lots in 1932 – both from members of the Barlow family – and bequeath them by deed to the Town in 1935 (PCRD 1681:119-121). At that time, Burial Hill came entirely under the ownership of the Town of Plymouth. The last person interred on Burial Hill was Anna Klingenhagen in 1957 (Berg and Friedberg 2012:9).

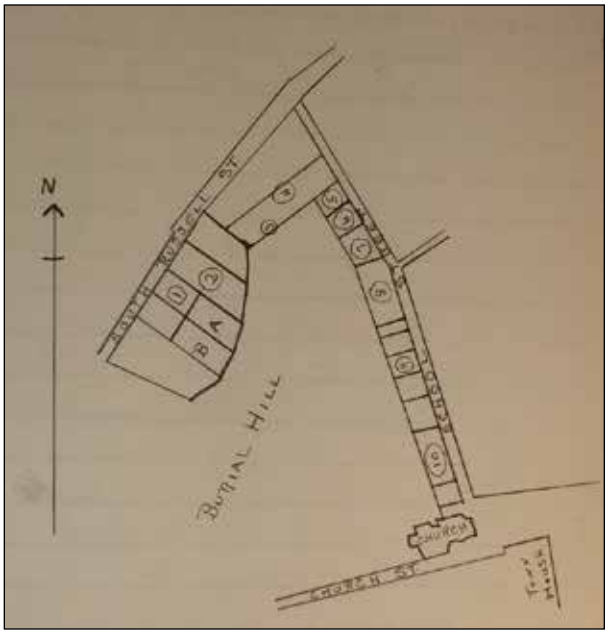


Figure 6. Map of the 10 parcels conveyed from the Stickney Fund to the town in 1929. Note that the lots are schematic and not to scale. Image courtesy of Pilgrim Hall Museum, from Pilgrim Hall Museum Archives, Minute of the Trustees of the Stickney Fund, 1932.

Specific History of the Project Area

The 2015 fieldwork consisted of STPs in the residential area on the north end of School Street and more extensive test excavations in the southernmost lots, covered by Zenas F. Leach's stables and the 1765 school, so the specific history of these areas is discussed in more detail. For this history, we consulted Davis (1899), the Beers and Sanborn maps of the area, and the land transactions recorded with the Plymouth County Registry of Deeds (PCRD). In order to relate the historic maps to the modern landscape and our excavation units, we georeferenced the maps in GIS (Fig. 9). This was very informative, but also pointed out ways in which different maps varied from each other, meaning that none of the historic maps are completely accurate in the ways that they relate the historic road, lot lines, and buildings to the modern landscape.

Davis (1899) summarized the history and chain of title for individual properties for much of downtown Plymouth. He divides School Street into 14 parcels, beginning at the north, at the intersection of South Russell Street, and ending just north of the Unitarian Church (Table 1; Davis 1899: 286-289). He does not number the parcels, but we have assigned numbers, in the order in which he listed them, for ease of reference. The lot dimension are taken from individual deeds; despite the variability in street frontage, the barn, stable, and school lots are described as 30 or 31 feet deep along this stretch of School Street. This uniformity can be seen in the maps. The dimensions of the buildings on the maps also suggest that the barns and stables were built to fill the whole 30 foot depth, leaving no back yards, while the domestic structures took up only a part of each lot.

The specific lot histories of the path up Burial Hill and lots 6 to 9 above are covered in the report on the 2014 field season (Beranek et al 2015: 11-13). Below are brief histories of the lots on the northern part of School Street, where the 2015 STP survey took place, and more detailed histories of the parcels at the south end of School Street where the 2015 excavation units were located.

Residential Lots at the North End of School Street

North of the path up Burial Hill there are 5 lots that front on School Street. One of these houses, possibly the house on lot 3 or 4, is show in Figure 10, indicating the way in which the building was set into the hillside with the front door at street level and back wall cut into the slope. These lots begin at the north with the lot with two buildings labeled Mrs. Hardey and I. Snow on the 1874 Beers map (Fig. 4; parcel 1 in Table 1). None of our test pits were placed on this lot, but fell on the 4 lots south of that, labeled N. C. Lanman Est., T. Attwood, J. C. Barnes, and unlabeled (Fig. 4, parcels 2-5 in Table 1).

Parcel 2 was conveyed from the town to William Goodwin in 1799 (PCRD 153: 169) and called the Hill house lot in several subsequent deeds. There was a house on the lot by the time of the next transfer in 1825 (PCRD 155: 240). The property had a few owners for long stretches of the 19th century, but by the end of the 19th and early 20th century it was transferred several times in quick succession. An 1885 deed indicates that the property was being rented (PCRD 523: 205). It

Figure 7. Photograph taken after the demolition of the stable buildings and school on School Street, looking north, before the area had been fully filled and graded.

was present on the 1901 Sanborn map, but gone by 1919 (Fig. 8).

Parcel 3 was sold by the town to Nathaniel C. Lanman in 1830 (171: 29), who also acquired parcel 1 around the same time suggesting that he also may have been using some of these houses as rental properties. The deed to Lanman from the town mentions a stone wall on the western boundary of his property, separating his lot from the burial ground. This lot corresponds to a section of the modern topography where there is a very steep slope between the edge of the burials and flatter land along the street where the houses were located. This steep drop-off may correspond with the former location of this wall. Deeds for this parcel mention the stone wall through the 1880s, as well as a dwelling house and other buildings (for example PCRD 501: 491). The lot had a house on it until at least 1901 which was removed by 1918 (Fig. 8)

Parcel 4 was conveyed by the town to Ebenezer Luce through the town meeting (rather than by deed) on June 4, 1787, according to the reference in the next deed for the property (PCRD 322: 240). The 1864 deed (PCRD 322: 240) does not mention a house, and the subsequent deed (PCRD 356: 80) in 1869 refers to the land as vacant. The 1874, 1885, 1891, and 1901 maps show a building on the property, which like the others along this stretch was demolished by 1919 (Figs. 4, 5, and 8).

Parcel 5 was sold to Joshua Thomas by the town in 1798 (PCRD 86: 117). It seems never to have been a residential property. The building on the lot was referred to in various deeds as a barn (PCRD 322: 240 in 1864) and a music hall (PCRD 299: 123 in 1860). This building disappears from the Sanborn maps between 1891 and 1901 (Fig. 8)

STPs N, O, P, and Q fell in and around parcel 5, the barn/music hall. STP R was behind the house on parcel 4. STPs S and U were probably on land associated with parcel 4, although the 1874 and 1885 maps vary significantly, making it hard to tell how the STPs relate to the structure. STP T could be associated with either parcel 3 or 4, depending on the georeference. STP X is associated with parcel 3, and STPs V, W, Y, and Z fall between and behind the houses on parcels 2 and 3.

Southern Parcel History

Zenas F. Leach's Parcels

Leach owned land in several places along School Street, but he was the last private owner

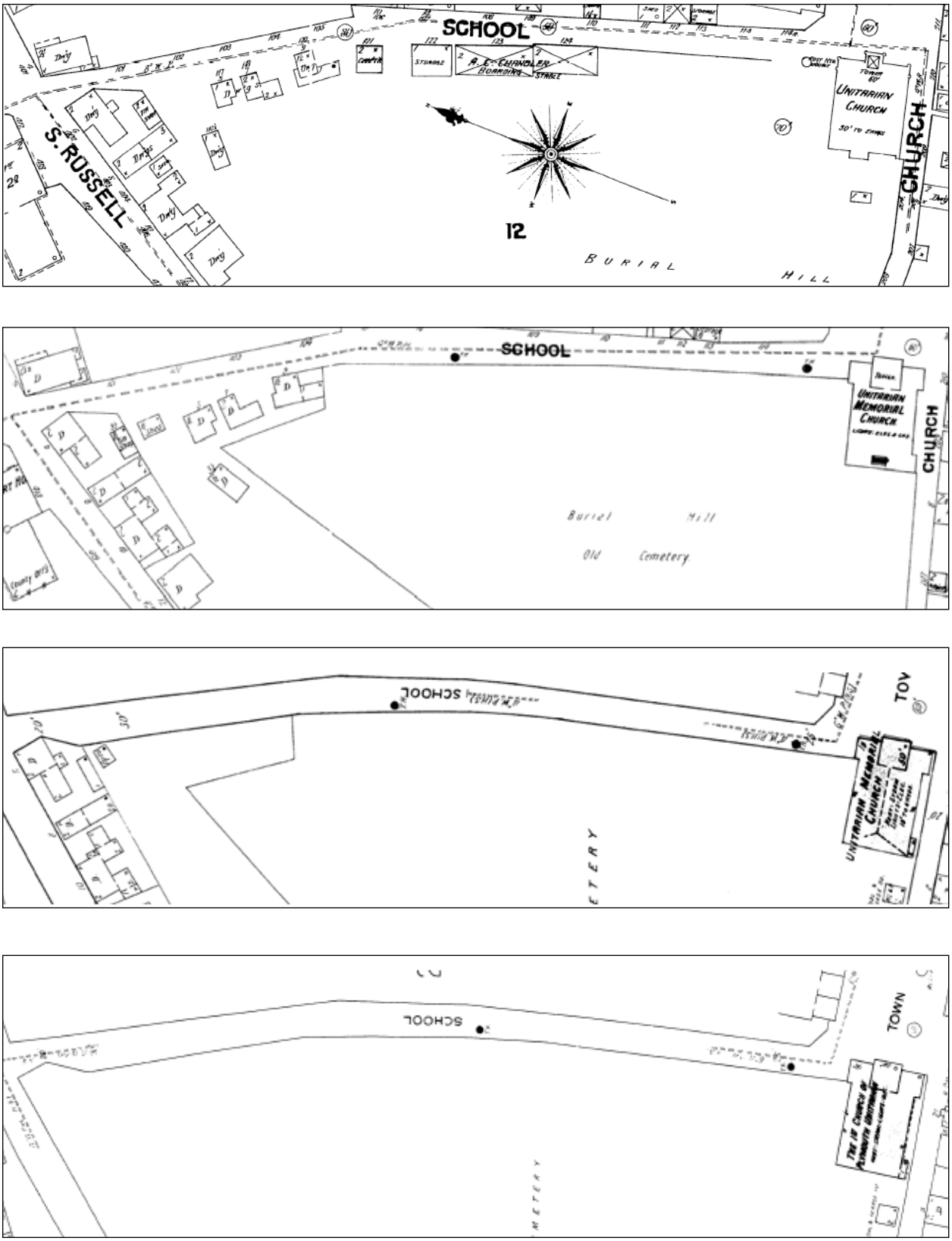


Figure 8. Details of School Street on successive Sanborn maps (1891, 1901, 1919, and 1927) showing the demolition of buildings from south to north.

Figure 9. Outlines of the buildings from the georeferenced 1874 and 1885 maps, over the south end of School Street. This view makes clear the differences between the building locations on the two maps. The numbers in the margins are the coordinates of the state plane grid.

Figure 10. Photograph of houses along School Street, showing how they were cut into the hillside (Baker and Keith 2013: 8).

of three lots at the south end of the street, which he sold to the town in 1884 (PCRD 503: 102) at which time they contained "old stable buildings." Davis outlines the complex early history of these lots (1899: 288-289) which were all acquired by Caleb Rider in 1833 and 1843. At least two of those parcels had early 19th-century buildings on them when Rider acquired them. At the northern end was a barn, rebuilt after an 1835 fire (parcel 10 in Table 1). On the parcel south of that (parcel 11 in Table 1) was a stable built while William and Thomas Davis owned the property (1798 to 1833), which Davis asserts is the same building occupied by Leach in the 1880. The original deed from the town to William Davis for parcel 11 (PCRD 84: 217) in 1798 says that Davis and his heirs must "support the bank on the westerly side of this

Table 1. Parcels along School Street, as defined by Davis (1899).

Parcel # (order in Davis 1899)	**Date of sale by town (as listed by Davis 1899)**	**Manner by which land reverted back to the town**	**Frontage on School St.**
1	1810	NB: this is the lot marked as belonging to Mrs. Hardy and I. Snow on the 1874 Beers map (Fig. 4). Becomes lots 3 and 4 of the Stickney Fund transfer to the town (PCRD 1576: 398) in 1929	38 ft
2	1793	Becomes lot 5 of the Stickney Fund transfer to the town (PCRD 1576: 398) in 1929	38 ft
3	1830	Becomes lot 6 of the Stickney Fund transfer to the town (PCRD 1576: 398) in 1929	50 ft
4	1787	Becomes lot 7 of the Stickney Fund transfer to the town (PCRD 1576: 398) in 1929	40 ft
5	1798	Becomes lot 8 of the Stickney Fund transfer to the town (PCRD 1576: 398) in 1929	?
n/a	n/a	Path leading up Burial Hill	14 ft
6	Prior to 1766	Became school house lot following purchase by town in 1826 (PCRD 156: 288). School built ca. 1827.	51 ft
7	1790	Becomes lot 9 of the Stickney Fund transfer to the town (PCRD 1576: 398) in 1929	32 ft
8	1790	Becomes lot 9 of the Stickney Fund transfer to the town (PCRD 1576: 398) in 1929	38 ft
9	1740, 1736	Becomes lot 10 of the Stickney Fund transfer to the town (PCRD 1576: 398) in 1929	25 ft + 25 ft
10	1736	Together with lots 11 and 12, sold to town by Z. F. Leach in 1884 (PCRD 503: 102)	32 ft
11	1798	Together with lots 10 and 12, sold to town by Z. F. Leach in 1884 (PCRD 503: 102)	56 ft
12	1722	Together with lots 10 and 11, sold to town by Z. F. Leach in 1884 (PCRD 503: 102)	?
13	n/a	Continuously held by town; school after 1765; Engine House in 1880s (Davis 1899: 288)	?
14	n/a	Part of Burial Hill; no street frontage	n/a

land forever," suggesting that at or beyond the west boundary of the lot was an embankment that may have already been supported or reinforced by 1798. Creation of this embankment may have involved pre-1798 cutting and filling activities, effectively creating some early artificial terraces on this section of the hill.

The three lots were held by Rider until the 1860s, then all transferred several more times in the 1870s and 1880s before being purchased by Leach in 1882. These were among the first buildings on School Street to be demolished, probably soon after they were acquired by the town since they are absent from the 1885 Sanborn map. EU3 (in 2014) and EU12 (in 2015) encountered the back wall of a building that was likely on this parcel. EU10 was within the footprint of the buildings owned by Leach.

The Engine House Lot

The last lot on School Street (at the south end, just north of the Unitarian Church) is identified by Davis as part of the original land held by John Alden, but held by the town since 1627 and vacant till 1765 when a school house was constructed there (1899: 288-289). The building was put to

Figure 11. Historic photograph (ca. 1870) showing the town tombs and the roof of the school building (Baker 2002: 79).

other uses in the 1870s. An 1872 deed for land directly north of the school-house says of the school, "the old building formerly used as a school house, and now recently as an armory" (PCRD 394: 23), and it appears with the label of "engine house" on the 1874 Beers map. It was demolished a few years prior to Davis' first edition of his book in 1882, and he noted that the lot had been "recently graded and fenced by the town" (Davis 1899: 286).

Davis himself had attending this school, and describes it in his memoirs (Davis 1906: 339):

> The high school house was situated on the north side of the Unitarian church between School street and the town tombs, and was a one story building about forty-five feet long and twenty or twenty-five feet wide with a door on the southerly end… Standing on sloping ground the foundation of the house of the street side was high enough to admit of a cellar above the street level…The house was built in 1770, and until 1826 was called the central of grammar school, but in that year it received the name of high school. It had a belfry on its southerly end, and a bell with the rope coming down into a cross entry between the outer door and the schoolroom. When the house was taken for an engine house the bell was placed on the Russell street school house.

Town Crypt

The town crypt, or town tombs, that Davis refers to in his description of the school above, is a brick and stone structure built into the hillside with metal doors leading to individual crypts (Figs. 11 and 12). The doors face School Street, but as Davis indicated, when the tombs were constructed in 1833 they would have faced one side of the school building. The interior floors of these are about a foot below the exterior ground surface; the whole back wall is covered by the hill. In 2015, the door on the southernmost crypt was off its hinges (allowing us to look inside) and the interior was empty. Bradford Kingman, in Epitaphs From Burial Hill, describes the tombs in 1892:

As we ascend by the path leading from Town Square, on the right hand, are several granite block front tombs with iron doors, over which are marble caps, with the following names on them. The first one belongs to the town. The others in order are Finney, Barnes and Stephens. In the centre of the tombs is a marble tablet having "A.D. 1833" upon the same (Kingman 1892: 291).

Methods

Mapping and Geophysical Survey

Mapping was overseen by Dr. John Steinberg, and Steinberg and Dr. Brian Damiata oversaw the geophysical survey. Graduate students Eric

Figure 12. View of the south end of the "town tombs;" photo from 2016 after ivy had been removed from the front.

Johnson and Richie Roy assisted with mapping and survey. Prior to excavation and geophysical survey, a metric Massachusetts Mainland State Plane grid using the North American Datum of 1983 (NAD83); we used the benchmarks established during our initial work in 2013 (Beranek et al 2014). This grid system is also used by all MASSGIS products (http://www.mass.gov/mgis/massgis.htm). All geophysical transects and excavation areas on the site are accurately located within this projected grid. To establish this grid, Steinberg used 8 GPS points provided by the town of Plymouth, sighted with our own Topcon GPT-9005A robotic total station, to establish secondary benchmarks in the study areas. We used the total station to lay out grid points for the geophysical transects along the south side of Burial Hill and to record the location and surface elevation of the excavation areas.

A Ramac X3M Malå ground penetrating radar unit with 500 MHz antennae and a frequency-domain electromagnetic CMD Mini-Explorer were used for the surveys. Radar data were collected on transects spaced 20-25 cm (8-10 in) apart and processed as described below.

Field and Laboratory

Dr. David Landon and Dr. Christa Beranek directed the test excavations. The field crew consisted of students participating in a UMass Boston fieldschool (graduate students Kellie Bowers, Justin Warrenfeltz, Joe Trebilcock, Katie Wagner, Ramona Steele, Blaine Borden, Annie Greco, and Kerri Knigge; and undergraduate students Ashley Corbeil, Peter Leyden, Elizabeth MacDonald, Anya Gruber, Laura Macques-Jackson, Emily Williams, and Lauryn Poe). We also took applications for volunteers from the community and were assisted on a regular basis by several local volunteers (Bill Knowles and Karen Bellinger Wehner). Laboratory processing was completed by graduate students at UMass Boston, principally by research assistants working on the Plymouth 400 project (Nadia Waski, Annie Greco, Caroline Gardiner, and Leigh Koszarsky).

We excavated 13 shovel test pits (STPs) and 8 excavation units (EUs). All locations were mapped using the Massachusetts State Plane grid. Shovel test pits were excavated as 0.5 x 0.5 m (1.6 x 1.6 ft) squares; excavation units were primarily 1 x 2 m, with one 1 x 1 m unit. Within individual units or STPs, deposits were removed following the natural stratigraphy, and each distinct deposit or soil layer was given a unique context number. Excavation proceeded into the upper portion of the sterile B-horizon or C-horizon or until the maximum safe and practical depth was reached around 120 cm below the surface. In several units, cultural deposits continued below this depth. All excavated soil was screened through ¼ inch mesh

Figure 13. Dr. David Landon teaches a group of visiting school children about archaeology in Plymouth.

hardware cloth to retrieve cultural material. Artifacts were placed in ziplock bags labeled with the site, units, and context information. For the STPs, we drew profiles of a representative wall at the end of excavation. For the excavation units, we drew plans and took photographs at each level change and drew closing profiles of two ore more walls.

Bagged artifacts were removed to the Fiske Center's archaeological laboratory at the University of Massachusetts Boston. Glass, ceramic, and stable bone artifacts were washed; metal and fragile bone were dry brushed. They were rebagged for long-term storage. The artifacts were cataloged in a FileMaker Pro relational database; this catalog can be found in Appendix A. Artifacts are currently being curated at the Fiske Center at UMass Boston, but the whole collection will eventually be transferred to Plimoth Plantation so that it can be curated locally.

Public Outreach

Our fieldwork was conducted in a busy urban area, on a site easily accessible to local residents and tourists visiting the Burial Hill National Register site. As in previous years, the site was open to the public while we were working, and we talked to a large number of people, both residents of Plymouth and visitors to the area (Fig. 13). Although we did not keep a formal count of visitors, we estimate that we spoke to several hundred people over the course of the season. We also had two open house days at the end of the season to which we invited stakeholders from the local government and historical organizations. During these days, we had a small display of artifacts out at the site. Updates about the project were posted on the Fiske Center blog during the summer, and we have also used to blog to share some of the detailed results of the 2014 research (http://blogs.umb.edu/fiskecenter/category/plymouth/). We are developing a brochure to hand out and exhibit panels for display in the town in 2016 and a web exhibit about the results of the project to date (http://arcg.is/1SXpexk).

Previous Fieldwork

This summer's fieldwork built on work carried out over the last several years (Beranek et al 2015). In the summer of 2013, we used GPS points and surveying equipment (a Topcon Single Operator Robotic Total Station) to establish benchmarks on the Massachusetts State Plane grid along Burial

Hill, so that all of our work could be mapped using these coordinates. Using this system means that all of our survey, excavation, and historic map data can be integrated in a Geographic Information System (GIS) database and that in the future, other people will be able to accurately located our survey areas and excavation units. Many of the maps in this report show these coordinates in the margins. In 2013 and 2014, John Steinberg and Brian Damiata performed Ground Penetrating Radar (GPR) surveys along School Street, using a Ramac X3M Malå GPR unit with several different antennae. The surveyed were conducted by dragging the radar antenna along closely spaced (20-25 cm, or 8-10 in) parallel transects. The transect data was then processed to create maps, sometimes called slices, that show reflectors at different depths.

One of the reasons that we conducted our survey with such closely spaced transects was to enable us to detect unmarked burials. As part of our 2013 investigation GPR profiles were collected over marked graves further up Burial Hill in order to gain an understanding of the radar signatures that may be associated with burials in this cemetery. Several likely unmarked burials were identified in the survey data, and therefore we were able to avoid those areas during the excavations. Drs. Steinberg and Damiata have considerable experience in the use of shallow geophysical methods to map graves. Dr. Damiata is a geophysicist whose main focus is the use of GPR on archaeological sites, including grave identification (Damiata et al. 2013). In addition to extensive work in Iceland, in the past several years Steinberg and Damiata have used GPR to investigate and map cemeteries across the country, including projects in California, Connecticut, New York, Pennsylvania, Rhode Island, and Wisconsin. One prominent example involved mapping unmarked graves using GPR at the Friends Meeting House in Newport, Rhode Island (Steinberg et al. 2011; http://www.fiskecenter.umb.edu/Pdfs/GFMH_ArchGeoSurvey_Report.pdf)

We also conducted background documentary research for this project as part of the work for a Massachusetts Survey and Planning Grant, "Plymouth Colony Archaeological Reconnaissance Survey" (Landon and Beranek 2014). As part of this, an overview land use history and timeline were constructed, and all available historical maps have been gathered. Two of the earliest detailed maps for this area are the 1874 Beers map (Fig. 4), which provides outlines of buildings and names their owners, and the 1885 Sanborn Fire Insurance Map (Fig. 5), which depicts building outlines and sometimes the function of each building. We created the GIS database in which the GPR slices, air photos, historic maps, and other data could be layered. Historic maps were added to this database by a process known as georeferencing that links historic map features to the modern landscape (Fig. 9). We also carried out detailed deed research on the parcels along School Street to understand their 18th through 20th-century histories

Finally, we were able to use the results of the 2014 fieldwork (Beranek et al. 2015) to help us make decisions about where to excavate in 2015. In 2014, we tested four different historic building lots (from north to south: the Town School, PLY.HA.65; the Chandler Stables; the Harlow and Bailey building, PLY.HA.64; and the Zenas F. Leach Stables, PLY.HA.63). We encountered foundation walls of the Harlow and Bailey building and the Leach stables, while the excavation units on the Chandler site and the Town School were within the building footprint. These excavations gave us a good understanding of the general construction and demolition processes used to build and then remove the buildings seen on the 1874 and 1885 maps. The buildings were entered from street level, and their back walls would therefore be cut deep into the hill. This process removed any deposits pre-dating the buildings. After the buildings were demolished, they were filled and the area was landscaped. In some cases, upper courses of the foundation wall were pushed east, into the building footprint. The material used to fill the different buildings varied. The fill over the Town School was primarily a dense deposit of bricks, possibly from the school structure. Further south, there were widely varied fill deposits containing different ratios of domestic material, industrial slag, and Native artifacts. The fill seems to have been brought in from elsewhere in Plymouth; the high concentrations of slag, possibly from industries

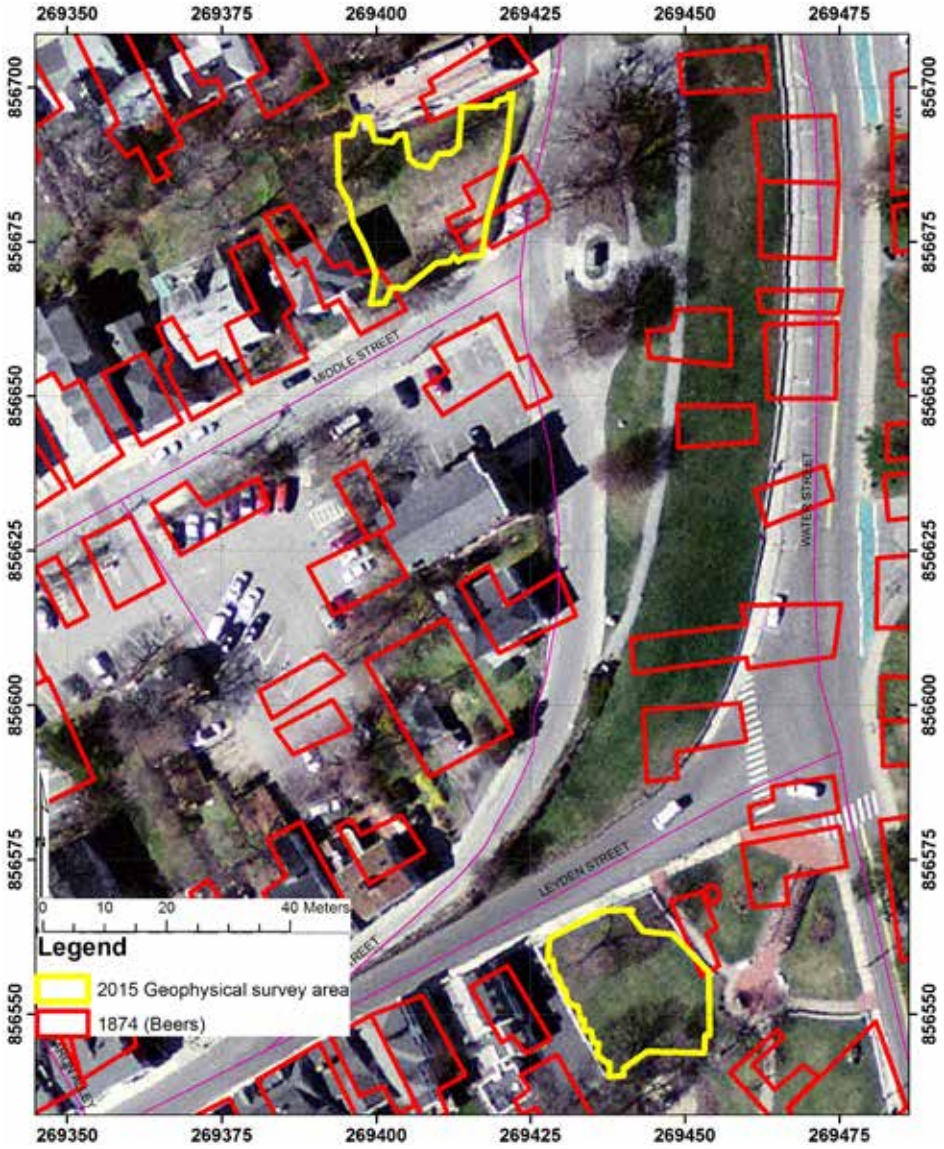


Figure 14. Location map of geophysical investigations at Brewster Gardens (lower yellow outline) and Pilgrim Society Lot (upper yellow outline). Red outlines denote buildings from the J.B. Beers & Co. 1874 map.

along Town Brook, are the clearest indication of this movement of fill material.

The 2014 excavations did not yield a significant number of 17th or early 18th century artifacts either in the building fill or in the areas behind the buildings, suggesting that either that area had been scraped and/or eroded or that we were too far north, outside the area covered by the 17th-century settlement. Therefore, we concentrated further south in 2015. Two additional units were placed to intersect the 19th-century buildings to answer specific questions, but we tried to place most of the excavation units outside the footprints of the 19th-century buildings.

Results of 2015 Fieldwork

In 2015, we conducted geophysical survey on Burial Hill and at two other sites in downtown Plymouth (Fig. 14) and excavated 13 shovel test pits (STPs) and 8 excavation units (EUs) on Burial Hill. An overview of the artifacts recovered from all excavation areas can be seen in Tables 2 and 3.

Table 2. Summary of artifact types from each excavation unit by count. Other includes arms and ammunition, organic, synthetic, utensils, and utilities

Unit	Architectural	Ceramics	Faunal	Fuel and Furnace	Glass	Lithic, Native	Lithic, Other	
EU10	196	743	358	379	719	336	36	
EU11	27	44	17	133	28	362	4	
EU12	146	221	20	163	259	12	13	
EU13	213	52	6	953	76	20	32	
EU14	424	142	26	539	630	21	77	
EU15	45	169	243	121	1215	12	36	
EU16	87	62	0	70	268	8	10	
EU18	357	107	13	670	844	21	36	
STPN	10	22	16	13	206	1	12	
STPO	6	37	20	23	145	0	4	
STPP	17	9	303	9	102	0	1	
STPQ	10	12	0	30	39	0	3	
STPR	20	14	1	53	55	0	19	
STPS	3	5	1	11	14	0	3	
STPT	0	12	3	0	5	0	0	
STPU	13	21	6	53	14	0	3	
STPV	11	6	1	37	13	1	0	
STPW	69	309	66	94	84	0	3	
STPX	17	37	4	14	4	0	0	
STPY	29	109	20	42	109	0	0	
STPZ	3	8	5	1	2	0	0	
Total	1703	2141	1129	3408	4831	794	292	
Percent	8.1%	10.2%	5.4%	16.2%	23.0%	3.8%	1.4%	

Geophysical Survey by John M. Steinberg and Brian Damiata

Geophysical investigations were performed at Brewster Gardens and the Pilgrim Society Lot. A combination of ground-penetrating radar (GPR) and frequency-domain electromagnetic (FDEM) surveys were conducted at the two sites. Summarized below are the site conditions, methodologies and results of the investigations.

Site Conditions and Establishment of Grids

Figure 14 depicts the location map of two geophysical investigations superimposed on a recent aerial photograph and includes the projected location of historical buildings that are based on a J.B. Beers & Co. (1874) map. The Beers map provides the first relatively accurate depiction of the outlines of specific buildings. Many members of the Beers family were making commercial maps and atlases of New York and New England, probably trained by John Homer French (Ristow 1985: 392), who made the first statewide consistently accurate maps of New York. While the Beers' map is not as accurate as the later Sanborn Fire Insurance Maps of 1885, 1906 and 1927 used in other illustrations, they seem to be remarkably accurate over the area. The 1874 historical buildings in the vicinity of Brewster Gardens include buildings owned by G. H. Drew on the west, the Pilgrims spring on the east and the Barnes pine barrel factory to the south. By 1906, on top of the area

	Metal	Nails	Other	Pipes	Small Finds	Total	% Total Finds
	357	891	37	33	13	4098	19.5%
	3	29	0	0	1	648	3.1%
	89	253	2	10	3	1191	5.7%
	396	79	3	5	2	1837	8.7%
	405	203	0	12	10	2489	11.9%
	633	1373	5	8	88	3948	18.8%
	117	160	3	3	10	798	3.8%
	277	211	6	11	8	2561	12.2%
	131	198	0	2	3	614	2.9%
	108	129	1	1	1	475	2.3%
	4	11	0	3	0	459	2.2%
	15	5	0	0	0	114	0.5%
	50	6	1	0	5	224	1.1%
	2	8	0	1	0	48	0.2%
	1	0	12	0	0	33	0.2%
	1	9	2	0	0	122	0.6%
	2	21	0	2	0	94	0.4%
	38	68	3	0	1	735	3.5%
	0	3	0	4	1	84	0.4%
	38	59	0	0	0	406	1.9%
	0	1	0	0	0	20	0.1%
	2667	3717	75	95	146	21021	100%
	12.7%	17.7%	0.4%	0.5%	0.7%	100%	

surveyed was a livery and carriage house labeled M. B. Blackmer. The buildings in the vicinity of the Pilgrim Society Lot include are primarily residential with the main area surveyed containing a duplex labeled A. Perkins, and a small empty lot to the labeled E. Jackson.

Grids were established at the two sites based on the Massachusetts State Plane coordinate system using a Topcon GPS and a total-station. At Brewster Gardens, the grid was laid over the grass-covered lot with the southeastern corner having coordinates of (E 269443 : N 856665). Along the western and eastern sides of the grid, a fiberglass measuring tape was laid and colored PVC flags were placed at integer-meter positions that formed the baselines for the geophysical transects. Every even meter, odd meter, 5 m, and 10 m location had a specific color. These colored flags were then used as the starting and ending points for the east-to-west transects that were traversed during the geophysical surveying. At the Pilgrim Society Lot, the grid was laid out with the southwestern corner of the grass-covered lot having the coordinates of (E 269400 : N 856544). The baselines were established along the southern and northern sides of the grid, which served as the starting and ending points, respectively, for the south-to-north transects that were traversed during surveying.

Geophysical Methodologies

The use of geophysical methods in support of archaeological investigations is widely established

Table 3. Ceramic types represented in each excavation unit.

Ware Type	EU10	EU11	EU12	EU13	EU14	EU15	EU16	EU18	STPN	STPO	STPP	
American Brown	3	0	0	0	1	1	0	0	0	0	0	
American Buff	1	0	0	0	1	3	1	0	0	0	0	
American Gray	0	0	0	0	2	0	1	2	0	0	0	
Border Ware	0	0	0	0	0	0	0	1	0	0	0	
Creamware	171	0	0	0	26	30	15	21	0	0	0	
Earthenware, coarse	7	0	4	2	4	21	0	0	0	0	0	
Earthenware, refined	22	0	179	42	9	0	11	8	1	4	1	
Ironstone	34	0	0	0	2	34	2	18	0	0	0	
Jackfield	2	0	0	0	0	0	0	0	0	0	0	
Jackfield Type	1	0	0	0	1	0	0	0	0	0	0	
Luster Ware	0	0	0	0	1	0	0	0	0	0	0	
Manganese Mottled	3	1	0	0	1	0	0	3	0	0	0	
Native American	0	24	0	0	3	0	0	0	0	0	0	
Nottingham	3	0	0	0	0	0	0	0	0	0	0	
Pearlware	205	6	0	0	27	13	10	10	0	0	0	
Porcelain	28	0	1	1	2	4	2	5	0	0	0	
Redware	165	1	36	7	44	28	18	18	0	0	0	
Rhenish/Westerwald	3	0	0	0	0	0	0	1	0	0	0	
Rockingham	4	0	0	0	0	0	0	0	0	0	0	
Staffordshire Slipware	6	0	0	0	0	0	0	0	0	0	0	
Stoneware, coarse	2	0	1	0	1	4	1	0	0	0	0	
Stoneware, refined	1	0	0	0	0	0	0	0	0	0	0	
Tin Glazed	5	0	0	0	0	0	0	0	0	0	0	
White Salt Glaze Stoneware	6	0	0	0	1	2	0	1	0	0	0	
Whiteware	46	11	0	0	12	27	0	9	0	0	0	
Yellow Ware	25	1	0	0	4	2	1	7	0	0	0	
Total	743	44	221	52	142	169	62	104	1	4	1	

(e.g., Gaffney and Gater 2003; Linford 2006). For the present study, GPR and FDEM surveys were conducted. In general, the soils in New England are rated highly suitable for GPR and electromagnetics with little anticipated attenuation of energy (Doolittle 2009; Andersen 1980).

Ground-Penetrating Radar

The GPR surveys were performed using a Malå X3M system that was equipped with a 500 MHz antenna (Figure 15). Data were collected at a vertical scan interval of approximately 0.02 m along parallel contiguous transects that were separated by either 0.25 m (at Brewster Gardens) or 0.20 m (at Pilgrim Society Lot). The collection of data was guided by stretching a fiberglass measuring tape between the endpoints of 1-m spaced transects. However, the actual location along a given transect was determined by using a calibrated wheel attached to the antenna. The surveys were conducted in a uni-directional manner relative to the state-plane orientation. For Brewster Gardens, transects were traversed from east-to-west; a total of 118 radar profiles were collected and 1,857

	STPQ	STPR	STPS	STPT	STPU	STPV	STPW	STPX	STPY	STPZ	Total	Percent
	0	0	0	0	0	0	0	0	0	0	5	0.30%
	0	0	0	0	0	0	0	0	0	0	6	0.37%
	0	0	0	0	0	0	0	0	0	0	5	0.30%
	0	0	0	0	0	0	0	0	0	0	1	0.06%
	0	0	0	0	0	0	0	0	0	0	263	16.01%
	0	0	0	0	1	1	0	0	0	0	40	2.43%
	4	3	1	2	5	2	18	15	6	5	338	20.57%
	0	0	0	0	0	0	0	0	0	0	90	5.48%
	0	0	0	0	0	0	0	0	0	0	2	0.12%
	0	0	0	0	0	0	0	0	0	0	2	0.12%
	0	0	0	0	0	0	0	0	0	0	1	0.06%
	0	0	0	0	0	0	0	0	0	0	8	0.49%
	0	0	0	0	0	0	0	0	0	0	27	1.64%
	0	0	0	0	0	0	0	0	0	0	3	0.18%
	0	0	0	0	0	0	0	0	0	0	271	16.49%
	0	0	0	0	0	0	0	0	0	0	43	2.62%
	1	0	3	10	7	0	6	3	0	2	349	21.24%
	0	0	0	0	0	0	0	0	0	0	4	0.24%
	0	0	0	0	0	0	0	0	0	0	4	0.24%
	0	0	0	0	0	0	0	0	0	0	6	0.37%
	0	0	0	0	0	0	4	0	0	1	14	0.85%
	0	0	0	0	0	0	0	0	0	0	1	0.06%
	0	0	0	0	0	0	0	0	0	0	5	0.30%
	0	0	0	0	0	0	0	0	0	0	10	0.61%
	0	0	0	0	0	0	0	0	0	0	105	6.39%
	0	0	0	0	0	0	0	0	0	0	40	2.43%
	5	3	4	12	13	3	28	18	6	8	1643	100.00%

linear meters (6,093 linear feet) were traversed for the survey. For the Pilgrim Society Lot, a total of 152 radar profiles were collected and 2,560 linear meters (8,399 linear feet) were traversed for the survey.

The data were processed using GPR-Slice software (see www.gpr-survey.com; Goodman, et al. 1995; Goodman, et al. 2007; Goodman, et al. 2008;). The raw vertical scan data were gained, resampled and filtered (background removal and boxcar) to produce processed 2-D radargrams. On these radargrams, the presence of strong reflectors is indicated by a black-and-white banding pattern. Note that the raw data were collected in terms of the two-way travel time of reflected energy. To convert to a depth scale, radar wave velocities of 0.103 m/ns and 0.083 m/ns were assumed for Brewster Gardens and the Pilgrim Society Lot, respectively, based on standard curve matching of a few hyperbolas that were identified in the respective datasets. The processed radargrams were next combined to produce a pseudo three-dimensional (3-D) dataset. A total of sixty horizontal depth-slice images of approximately 0.16 m (Brewster

Figure 15. Survey in process: left) GPR surveying with the Mala X3 equipped with a 500 MHz antenna; right) FDEM surveying with the CMD Mini-Explorer.

Gardens) and 0.13 m (Pilgrim Society Lot) thickness with 50% overlap were generated to provide detailed spatial information on the location and depth of reflectors. These depth-slice images were then incorporated into the GIS database.

Frequency-Domain Electromagnetics

The FDEM surveys were conducted over the same grids as the GPR surveys. A GF Instruments CMD Mini-Explorer which operates at 30 kHz over three separate dipole lengths (0.32, 0.71, and 1.18 m [13, 28, and 46 inches]; Figure 15) was used. Data were collected in the vertical dipole mode at a sampling rate of 10 Hz, which yielded a measurement spacing of approximately 0.06 m when walking at a normal pace. The instrument was oriented parallel to the transect direction with the sensors located a few centimeters above the ground surface. The surveys were conducted in a uni-directional manner similar to the GPR surveys. Note that data collection was guided by PVC flags that were placed at 5-m intervals along selective transects. The location of stations was determined by fiducial markers that were placed into the data stream by the operator and assuming linear interpolation between markers. Both quadrature phase (bulk or apparent ground conductivity; referred to as C1, C2 and C3 for the shortest to longest dipoles, respectively) and in-phase (proportional to bulk ground magnetic susceptibility; referred to as IP1, IP2 and IP3) components were recorded for each of the three dipole lengths, resulting in approximately 200,000 combined measurements for each of the surveys.

The data were initially processed using in-house software to properly adjust the starting and ending locations of transects which in some instances did not exactly fall on a 5-m interval. The data were then processed using Oasis Montaj mapping software to produce color-contoured maps. These maps were then incorporated into the GIS database.

Results

Brewster Gardens

The processed GPR and FDEM data were inspected to identify potentially anomalous areas at the two sites. The GPR depth-slice images were combined to produced eight overlay images covering contiguous (but slightly overlapping) depth-intervals from the ground surface to 2-m depth, each having a thickness of approximately 0.25 m. Figure 16 depicts a representative overlay image for the depth interval 0.41 – 0.66 m for the survey at Brewster Gardens. Figure 17 depicts representative color-contoured maps of apparent ground conductivity and in-phase for the longest

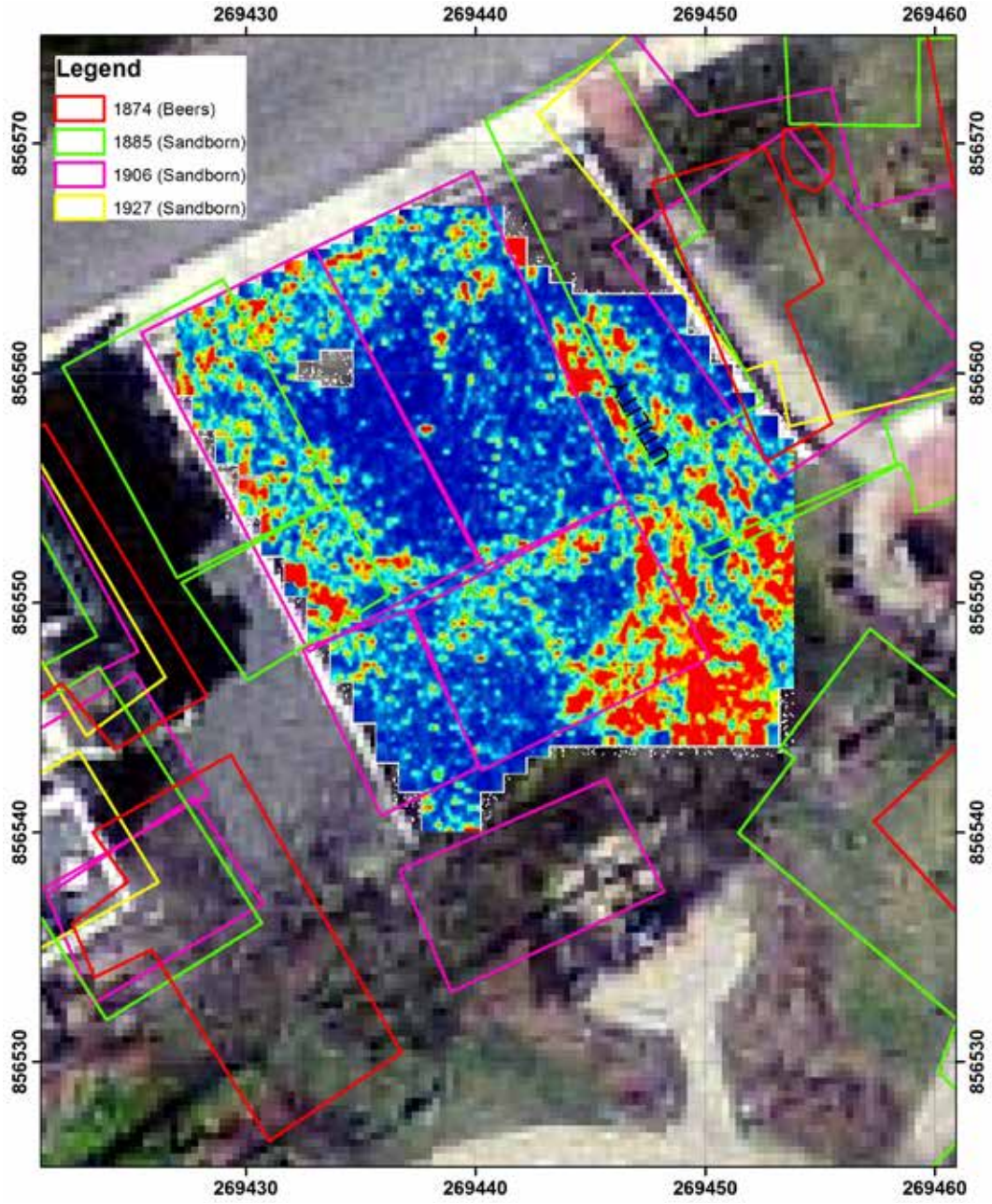


Figure 16. GPR overlay image for the depth interval 0.41 – 0.66 m for Brewster Gardens.

dipole (i.e., C3 and IP3, respectively) from the corresponding FDEM survey.

In general, the geophysical investigation of Brewster Gardens yielded high-quality data that will help to focus any future targeted excavations of the area. The most prominent anomalies are three linear features, most likely modern-day and/or historical piping, which are pronounced in the FDEM data. These features show as negative values of apparent ground conductivity (denoted in blue and labeled as pipes in Figure 17), which is a characteristic response to relatively large metal objects. The pipe along the western boundary of the grid is probably a modern-day utility (possibly sewer or water), whereas the other two are probably historical piping, as they appear to connect into the projected locations of buildings based on the 1909 Sanborn map. Although not as pro-

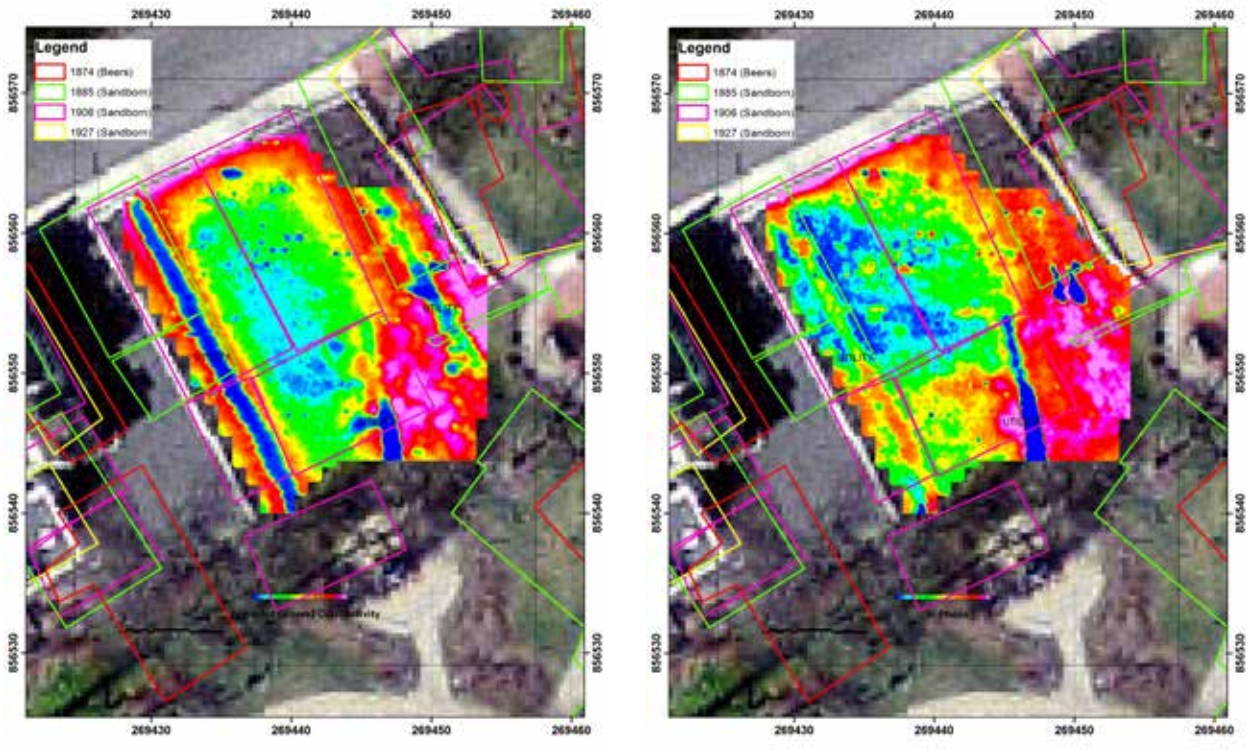


Figure 17. Left , Color-contour map of apparent ground conductivity (C3) for Brewster Gardens. Right, color-contour map of in-phase (IP3) for Brewster Gardens.

nounced in the GPR overlay images, these pipes are traceable in the individual radar profiles (data not presented). Note that most of the piping for the modern-day irrigation system, which is known to exist at the site, was not detected and is attributed to small-diameter PVC piping that does not provide sufficient contrast with respect to prevailing background conditions to be detected by either GPR or FDEM.

The eastern part of the grid is characterized by relatively high values of apparent ground conductivity and in-phase, as denoted by the pinkish areas in Figure 17. The relatively high values are attributed to high saline content and/or high clay content. The radar data are consistent with the interpretation, as can be seen in the upper profile of the example given in Figure 18, which shows likely attenuation below a depth of about 0.70 m at the eastern end. Alternatively, a total lack of reflectors would also be consistent with the observed data. Note that the ground surface rises in elevation from east to west. Thus, the interface defining the attenuation, although relatively horizontal, appears to dip to the west. As a consequence, the interface (i.e., strong reflectors denoted in red) appears to migrate to the west with increasing depth of the GPR overlay images. Also note the presence of strong reflectors that indicate interfaces or compacted surfaces that occur occasionally within the grid.

Pilgrim Society Lot

The geophysical investigation of the Pilgrim Society Lot also yielded high-quality. Figure 19 depicts a representative overlay image for the depth interval 0.47 – 0.73 m for the GPR survey. Figure 20 depicts representative color-contoured maps of apparent ground conductivity and in-phase for the longest dipole (i.e., C3 and IP3, respectively) from the corresponding FDEM survey.

The GPR data indicate several relatively long-length linear features that have been tentatively interpreted as building foundations or due to household mechanical demolition. This area corresponds to the suspected location of historic buildings as identified on J.B. Beers & Co. and

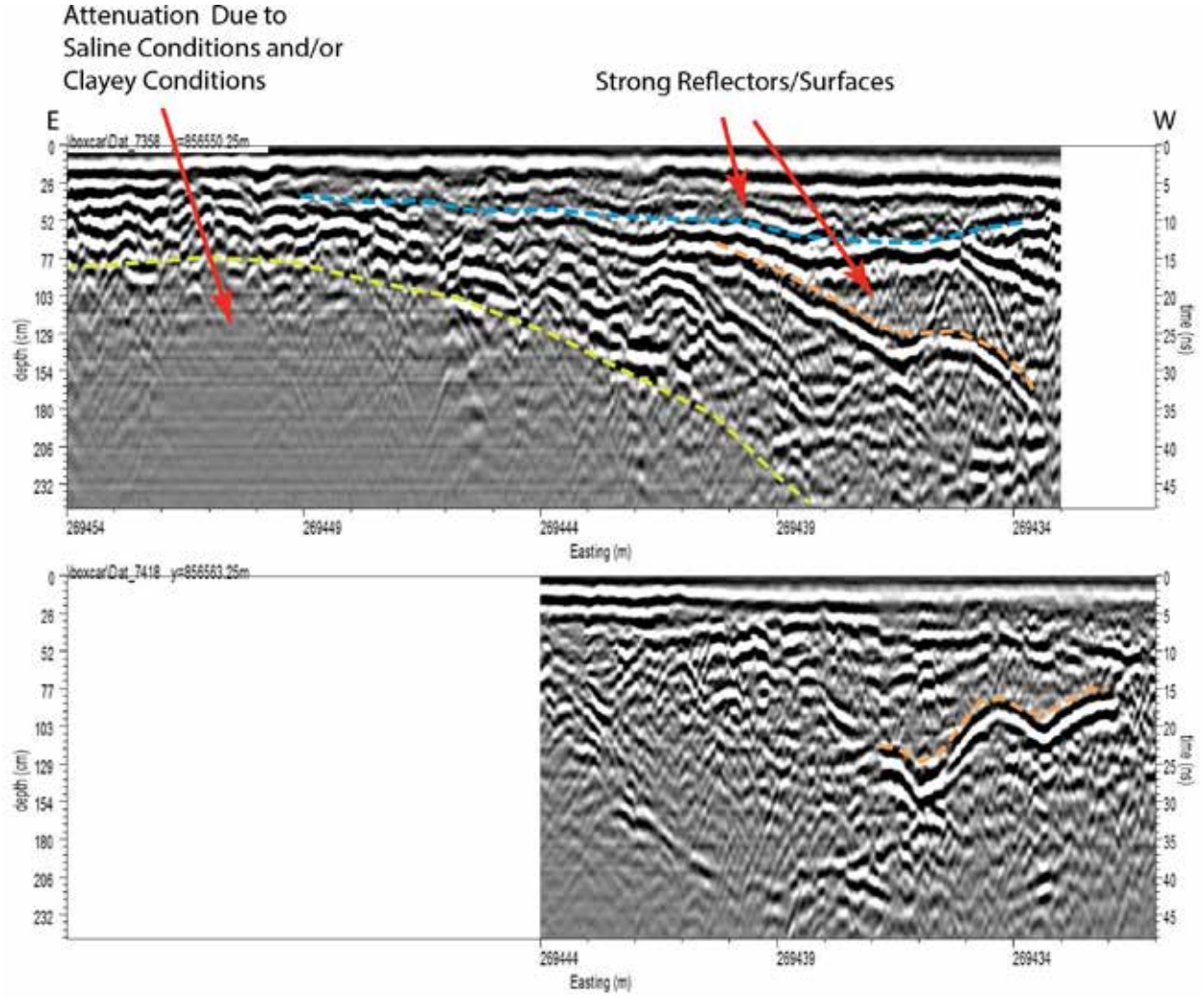


Figure 18. Example radar profiles from the southern (upper; E269434-269454, N856550.25N) and northern (lower; E269434-269444, N856563.25) parts of the grid. Note that ground-surface elevation increases from west-to-east across the radar profiles.

Sanborn Fire Insurance maps. In addition, there are several short-length linear features to the west that may be pipes, and which terminate at unknown features (possibly wells?). However, the absence of such linear features in the FDEM data implies that, if they were pipes, they are non-metallic (ceramic?). The FDEM data also indicates possible metallic debris strewn over a large part of the grid. The debris is interpreted in those areas of blue shading (i.e., negative values) on the map of apparent ground conductivity.

Carver Street at Middle Street on Coles hill has probably been widened and potentially shifted and/or made less linear. These shifts, combined with the substantial change in relief that begins at the edge of Coles Hill, could make otherwise well surveyed historic maps inaccurate and certainly does make georeferencing these historical maps difficult. That being said, the northeast part of the survey area may have been part of Carver Street while the southeast area may have lost area to the street. The shift in the georeferenced location of the duplex is more than 13 m, but the 1906 Sanborn map shows only a change of a few meters from the 1874 Beers version.

Shovel Test Pits

We used STPs, small 50 x 50 cm excavations,

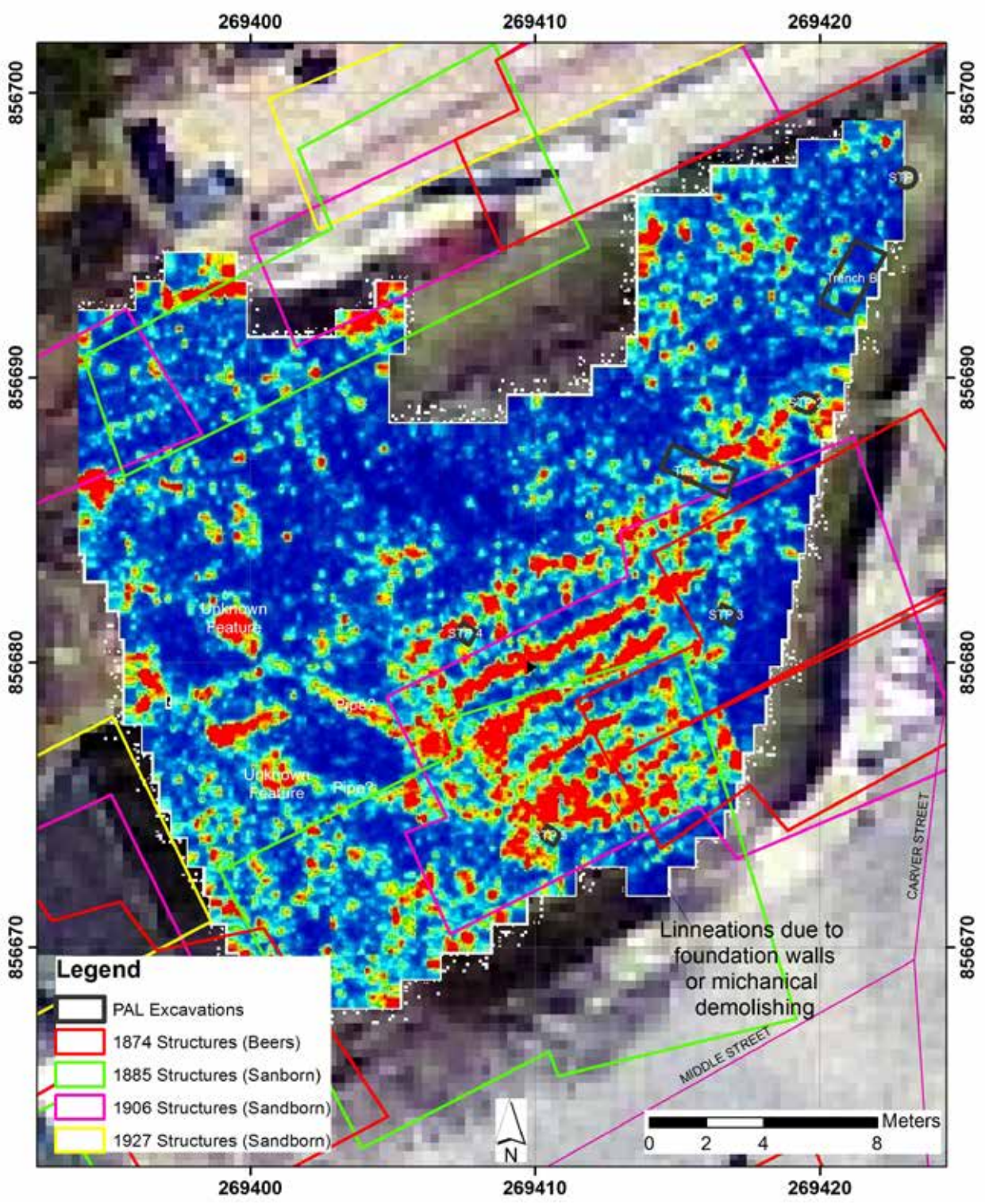


Figure 19. GPR overlay image for the depth interval 0.47 – 0.73 m for the Pilgrim Society Lot.

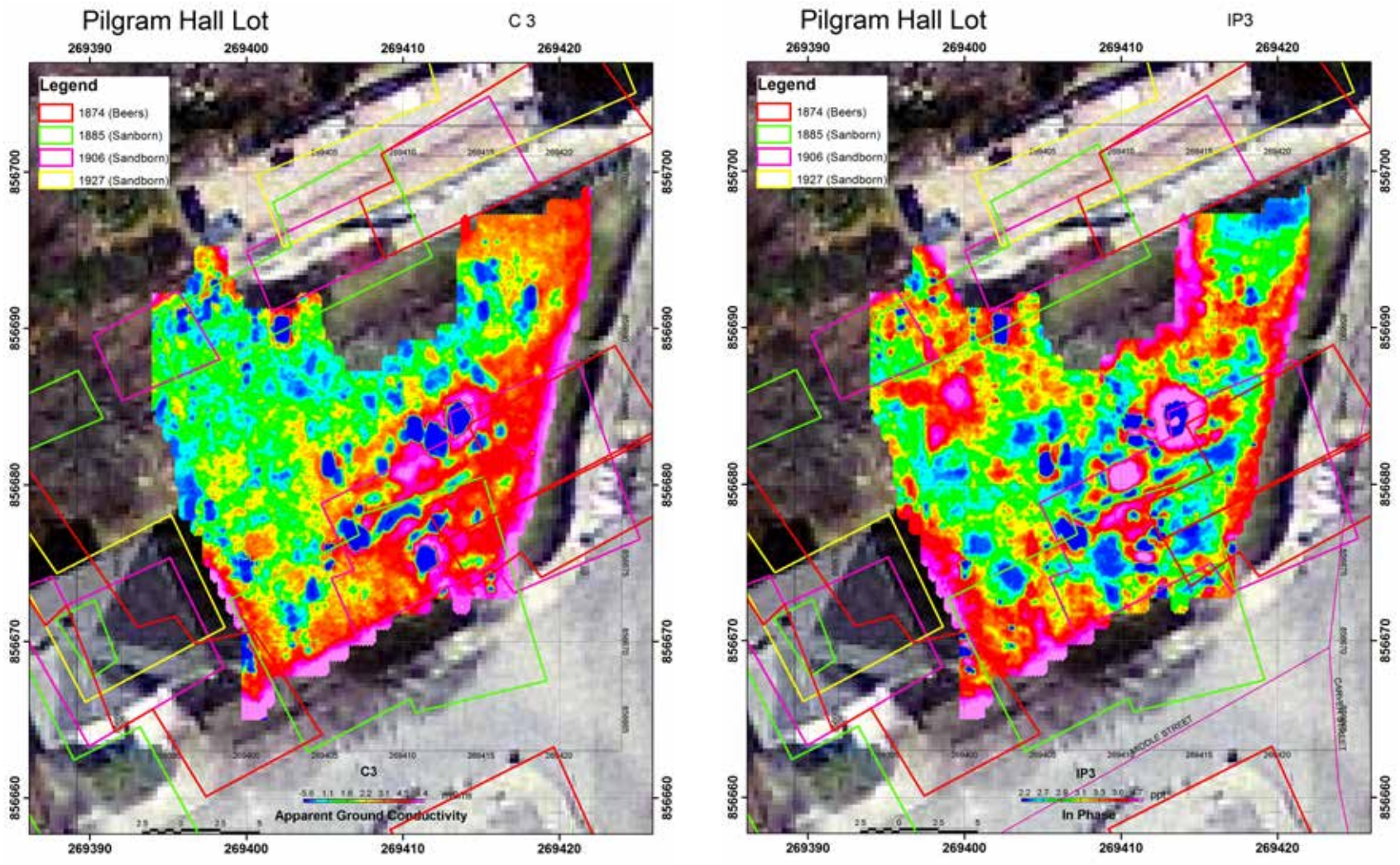


Figure 20. Right, color-contour map of apparent ground conductivity (C3) for the Pilgrim Society Lot. Blue splotches may correspond to metallic debris. Left, color-contour map of in-phase (IP3) for the Pilgrim Society Lot.

Table 4. General characteristics of STPs.

Grouping	STP	# of artifacts	Depth to B horizon	Notes
Behind buildings				
	N	614	55 cm	Fill over possible occupation layer
	P	459	104 cm+ (not reached)	Possible foundation wall; deposit w. abundant oyster shell
	R	224	100 cm	Fill over possible occupation layer
	W	735	86 cm	Burned deposit over possible occupation layer
	Y	406	85 cm	
Within/ between buildings				
	O	475	104+ (not reached)	Inside a building footprint, presumably filled cellar
	Q	114	35 cm	
	S	48	30 cm	
	T	33	13 cm	
	U	112	20-80 cm	Transition to B not noted in profile, but deposit sterile after ca. 30 cm bs
	V	94	40 cm	
	X	84	60 cm	
	Z	20	25 cm	

Figure 21. Possible gravestone fragment from STP R. Note the incised lines along two edges.

to quickly test the northern part of School Street. This area was divided into a series of residential lots in the 19th century (see above). Our conclusion from 2014 was that we were already outside (to the north) of the area covered by the 17th-century settlement, but we wanted to confirm that in an efficient manner. Some of the 13 STPs were placed to test specific geophysical signatures, or to be inside or outside of historic buildings. Others were placed at even intervals on the grid to sample the area generally. The STPs showed variation in depth to subsoil ranging from 13 cm to over a meter below the ground surface (Table 4).

When georeferenced, the two historic maps depicting buildings at the northern end of School Street show rather different positions for the outlines of specific buildings, making it difficult in some cases to tell if specific STPs were expected to fall inside or outside building footprints. Spatially, STPs N, P, R, V, W, and Y seemed to fall behind the buildings, while O, Q, S, T, U, X, and Z were within or between buildings (however, V shares more characteristics with the second group).

Interestingly, it was the STPs behind the buildings that had deeper and more complex stratigraphy and higher numbers of artifacts. This is in contrast to the areas further south on Burial Hill where the areas behind the buildings were shallow and in many cases almost devoid of artifacts (with the exception of nails). In STPs N, P, R, W, and Y the subsoil started at between 55 and 100 cm below the surface (Table 4). In several cases (STPs

Figure 22. Washing some of the oyster shell found within STP P in the field lab.

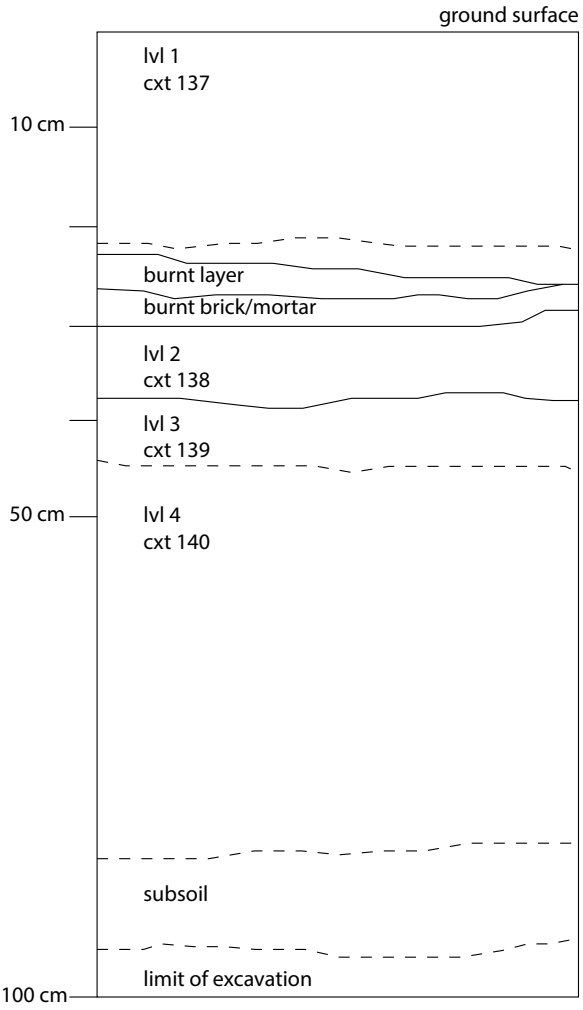


Figure 23. South profile of STP W.

N and R), there seemed to be a fill strata over an older occupation layer. STP R (context 109) contained multiple fragments of slate. One piece is very large and thick and is likely a portion of a gravestone. It is marked with thin parallel lines carved on two sides (Fig. 21). STP P encountered a dense deposit of oyster shells (Fig. 22) and several large unmortared stones in one wall, possibly the rear foundation wall of a building. STP W (Fig. 23) had a distinct burned deposit over a layer with a high concentration of artifacts, possibly an old ground surface and trash midden.

In contrast, the STPs within and between the buildings were much shallower and had fewer artifacts. STP O is the exception here; it clearly fell within a building footprint, and seems to represent a low density fill of a filled cellar, similar to buildings further south on Burial Hill. STPs Q, S, T, U, V, X, and Z however tended to have only shallow deposits over the subsoil, with a low artifact density and few stratigraphic changes. We excavated two of these (STPs S and T) more than 50 cm into the sterile layer to confirm that it was in fact subsoil and not simply a clean fill.

The interpretation of this area is tentative because it is based on a relatively small amount of excavation, but it seems that the area close to the street was scraped clean either to build or demolish the buildings (or possibly both) leaving no preserved ground surfaces in the area close to the street, and few confirmed deep fill deposits, except what is represented in STP O. It may be that the houses along this segment of the hill did not have basements, in general, and were built up more than cut into the hillside. With the exception of the building encountered in STPs O and P, we did not find any structural remains or deep fills, suggesting that the houses here were either not very substantial and were removed from the landscape very thoroughly. Not much fill was added after the buildings were removed. Because of the variation in the georeference of the two historic maps, we cannot be sure which STPs fell within buildings and which were between them. Unlike the large stables to the south, these houses did not fill their

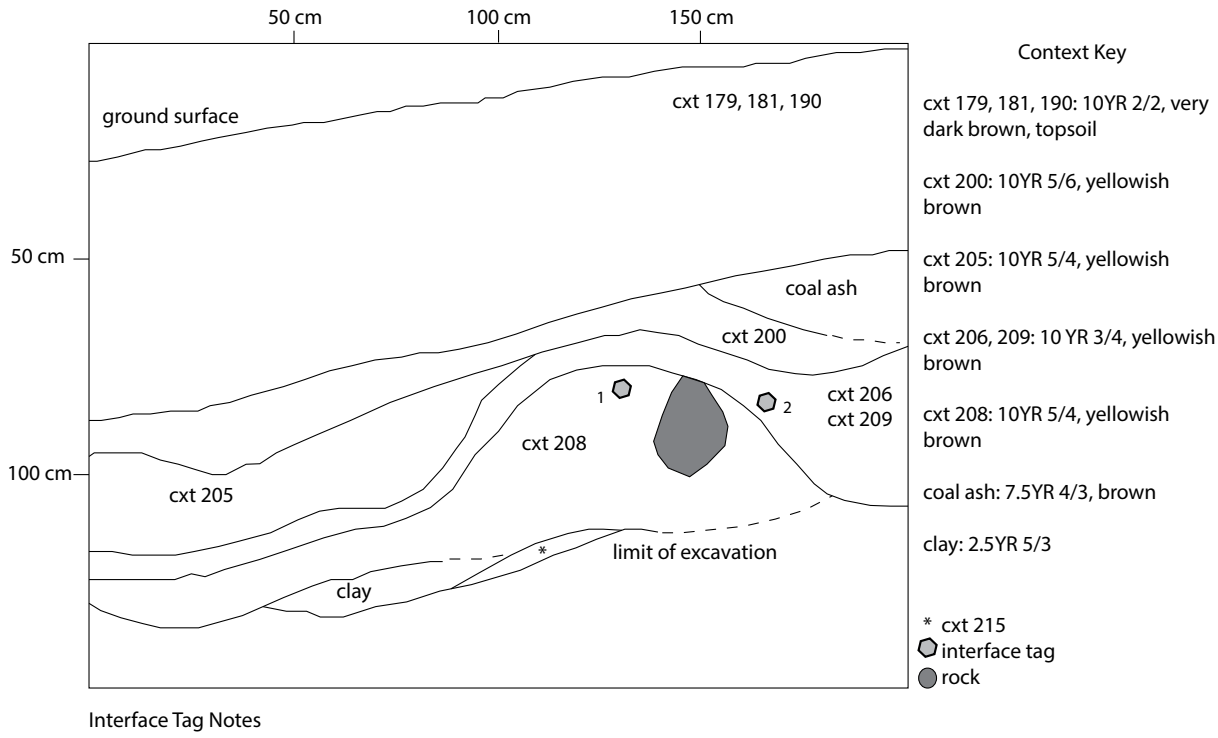


Figure 24. EU 10 east profile.

whole lots, so had back yards. The STPs behind the buildings suggest that some of the deposits in these yards are preserved (see especially STP W). This area of preserved yard deposits may be visible in the geophysical survey (see below).

Excavation Units

Our eight excavation units were located in the area south of the 2014 fieldwork, near the south end of School Street. All of the excavation units were 1 x 2 m, with the exception of EU16, which was 1 x 1 m. At the far south end of School Street, the area available for work becomes very constrained, with a narrow area between the backs of the previous buildings and the location of an above ground crypt, built in 1833 (Fig. 12). The 2015 excavation units were all placed in and behind (west of) the 1765 school (labeled "Engine House" on the 1874 map) and the buildings last owned by Zenas F. Leach (the two connected structures labeled "Livery Stables" on the 1874 map). The specific history of these parcels is discussed in an earlier section.

Two units were placed to test parts of Leach's stables (EU10 and EU12); all of the other units were intended to fall behind the buildings. In several cases, however, we found that the area that had been cut into, either when constructing or demolishing the buildings, was much larger than the footprint of the buildings themselves, meaning that in some places very little ground is preserved between the cut for the buildings and the start of the historic burials. Nevertheless, in two areas we found deposits that pre-dated the buildings known from historic maps. EU11 consists of an intact segment of a Native American site, possibly a Late Woodland stone tool making workshop; EU14 contained a small segment of an early colonial feature.

EU 10

EU10 was placed within the footprint of stable buildings last owned by Zenas F. Leach, demolished in 1884-1885, and as close to School Street as possible, with the hope that we would be able to reach the floor level to provide more information about the building's construction, final uses, and demolition. Using historic maps, it was placed

Table 5. Lithic artifacts from the top stratum of EU10 (contexts 171, 181, 190).

	Tools	Core	Flakes	Shatter	Total	% Total	% Total excluding shatter
Quartz	9	1	96	201	307	94.17	84.8
Chert (black)			1		1	0.31	0.8
Argillite			3		3	0.92	2.4
Rhyolite (red)			5		5	1.53	4
Rhyolite (gray)			10		10	3.07	8
Total	9	1	115	201	326	100	100

on the approximate dividing line between two of these buildings. However, we reached the limits of safe excavation before reaching the bottom of the demolition fill deposits.

The uppermost stratum in EU10 was a very thick (50 cm), dark level of topsoil (Fig. 24). This amount of topsoil is not usual, suggesting that this material was deposited here, either intentionally when filling the buildings or by erosion, as topsoil from up the hill washed down over time. It contained a mixture of late 19th-century domestic artifacts and Native flaked stone tools, a core, and debitage (Table 5). This layer was on top of the fill that was put in place when the building was demolished, so the artifacts were deposited from elsewhere and do not represent a Native American site in this specific location. They could have eroded from a Native site further up the hill or may have been brought in with topsoil from another location. The differences between the in situ Native assemble in EU 11, upslope, and the lithic assemble in EU 10 suggest that these artifacts in EU 10 were brought in from elsewhere (see discussion below).

The thick topsoil contained a large range of ceramic types, including Rockingham, Manganese mottled, ironstone, porcelain, Rhenish stoneware, Nottingham, Jackfield type, and white salt glaze. Interestingly, three sherds of early yellow ware are present, all with a pale-colored paste yet varying in thickness. Part of a white porcelain doll face displays a nose, right cheek, and individually-carved upper teeth. It is hollow-cast and missing a glaze. The mouth was a separate piece attached to the face interior, indicating that the doll was not manufactured with a single mold. However, without pigmentation, hair or dress representation, or further manufacturing method marks this artifact cannot provide a certain date range. Two carbon battery rods, dating from 1896 onwards, and a modern rubber container rim were also found within this context (Miller et al. 2000). Finally, an 1868 copper alloy nickel was found (Yeoman 1970: 91). The reverse is inscribed with 'UNITED STATES OF AMERICA' and a center '5' encircled by small stars. In contrast to the other type of nickel circulating within this time period it does not have rays between the stars. The obverse displays a large shield surrounded by garlands.

The lower strata within this unit represent fill layers as well. They had lower artifact densities than the redeposited topsoil. Of note was a layer of oyster shells within context 206. This is likely food trash and seems to be a single deposition event. Also significant was a clay patch in the northern half of context 215. This is very different than almost all of the deposits on Burial Hill which are predominantly quite sandy and contain almost no clay. Because it was at the limit of safe excavation, we did not expose its full extent. It could represent a portion of an intact or redeposited building floor. Clay was sometimes put down as a moisture barrier which might have been needed in a stable.

EU10 Lithics

All of the tools, one of the two cores, and 316 of the 325 flakes and pieces of quartz shatter were found in the uppermost stratum of EU 10. This sub-assemblage is described in more detail here. The assemble is dominated by quartz, whether the large number of pieces of quartz shatter with no evidence of flaking are considered or not. Chert (unidentified source), argillite, and several colors or rhyolite are also present, but in much smaller numbers. The tools, all of quartz, consist of two

Table 6. Comparison of materials between EUs 9 (excavated in 2014), 10, and 11. Counts for tools, cores, and flakes, excluding shatter and pebbles.

Material	EU9 count	EU9 %	EU10 count	EU10 %	EU11 count	EU11 %
Quartz	83	82.2	106	84.8	55	16.62
Rhyolite	15	14.8	15	12	256	77.34
Other	3	3	4	3.2	20	6.04
Total	101	100	125	100	331	100

Figure 25. Native stone tools recovered from EU 10; top row, small stemmed points; bottom row, small triangular points, bifacial scraper, and flake scraper.

possible scrapers, four small stemmed points, and three small triangular points (Fig. 25). Since the small triangular points could be Snappit or Squibnocket triangles, which Boudreau notes are difficult to distinguish (Boudreau 2008: 15-16), they have a broad time range from the Middle Archaic to the Middle Woodland. The small stemmed points have a similarly broad time range (MHC 1984: 86-93). This assemblage is very similar to the lithics found in the upper layers of EU 9 in 2014 (Beranek et al. 2015: 47) in composition and stratigraphic position. The 2014 collection consisted of quartz shatter (74), quartz flakes (77), flakes of other materials (17), and seven tools (1 rhyolite scraper, 4 small stemmed quartz points, and 2 other quarts points). The lithics in EU9 were also concentrated in the upper layers of the unit, mixed with 19th-century ceramics. EU 9, like EU 10, was at the bottom of the slope, near School Street.

Using information from the 2014 and 2015 excavation seasons, we feel that we now have enough data to hypothesize that the lithics found in the upper layers of EUs 9 and 10 were brought in from elsewhere with fill material that was placed as a landscaping layer after the building footprints were filled. We do not believe that they have eroded from an intact site higher up the slope on Burial Hill. There are two primary reasons for this interpretation. Firstly, in both units, the lithics were mixed with 19th-century materials. If the lithics were deposited by erosion from upslope, we would have to hypothesize that the ceramics and other materials were also deposited similarly. However, there are no deposits up the slope in these areas that would seem to be the source for the array of domestic material found in EUs 9 and 10. Secondly, in 2015 we identified an intact portion of a Native site higher on the slope (see discussion of EU 11 below), and the lithic assemblage from this unit is very different than the assemblage from EUs 9 and 10. The EU 11 assemblage contains only one partial tool, a rhyolite point tip, and a possible quartz scraper. Rhyolites are the dominant material type (77%), while quartz accounts for only 17% of the flakes (Table 6). This is the reverse of the EU 9 and 10 assemblages where quartz is the predominant material (85% of flakes and tools). Given the very different material profiles for the two areas, we do not feel that the lithics in EUs 9 and 10 are related to the site represented in EU 11.

EU 11

Based on georeferenced historic maps, EU11 was located immediately behind (west of) one of

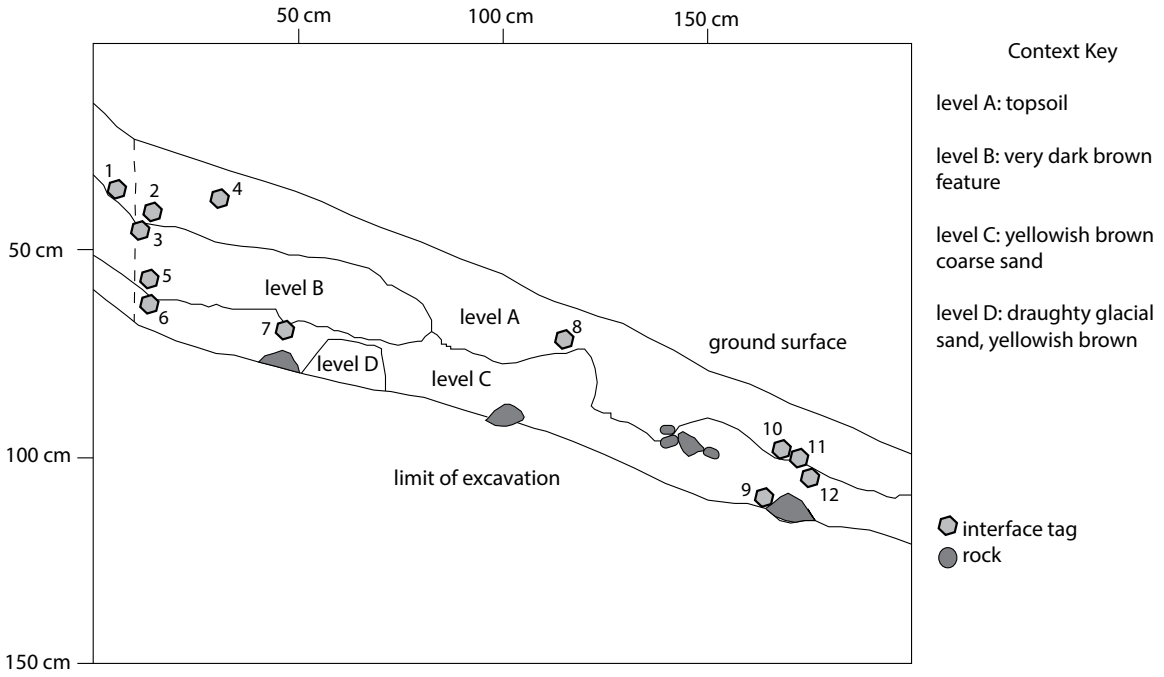


Figure 26. EU 11 north profile.

Zenas Leach's 19th-century stables, one of the buildings that lined present-day School Street. There was no evidence that this unit was filled or disturbed by the construction or demolition of this or any other structure at the base of Burial Hill. The unit was on a steep slope and cultural deposits in the unit were shallow (Fig. 26).

Only 19 European ceramic sherds and one redware sherd were recovered from contexts 144 and 150 within the unit's topsoil. In contrast to these low numbers, 361 Native lithics were found (Table 7). These include unworked pebbles, flakes, and a point tip in a wide range of materials. There were also 24 Native ceramic fragments. A small pit feature in the northwest corner of this unit had a dark brown soil matrix and contained a high concentration of these artifacts as well as two shell fragments. One of these was sent for radiocarbon dating. This feature and the overall composition of EU 11 provide evidence that this unit represents an intact Native site. Given that Native people have occupied the Plymouth area for a long time, and that the English colonists recorded that they settled on a Native village site, it is not surprising that there was Native occupation on Burial Hill. However it is surprising and very significant to confirm that a piece remains intact, especially given the shallowness of this unit's deposits.

EU11 Lithics

To identify the lithic types represented, we compared materials to Barbara Leudtke's type collection and then also had Joe Bagley, City of Boston archaeologist, examine the lithic collection from this and other units. We are grateful for Bagley's help in identifying the lithic sources and materials and his comments on the assemblage. The collection is dominated by local rhyolites from the Lynn volcanic formation and the Blue Hills, with a much smaller percentage of quartz (Tables 6, 7; Fig. 27). Other materials represented include argillite, Coxackie chert from New York, quartzite, rhyolite from Mt. Jasper in Berlin, NH, and a single piece of either Pennsylvania or Saugus jasper, making up 6% of the collection together. Therefore, the material is primarily local and would have been available as glacial cobbles on the beach nearby. The high density of flakes suggests that this area was a lithic workshop. However, very few pieces had cortex suggesting that the initial stages of lithic reduction were taking place elsewhere. Partial or finished tools were

Table 7. Lithic material from EU 11, all contexts. Joe Bagley assisted with lithic source identification.

	Tools	**Cores**	**Flakes**	**Shatter**	**Cobbles/ pebbles**	**Total**	**% Total**	**% Total excluding shatter, cobbles**
Quartz	1		54	17	6	78	21.61	16.62
Chert			5			5	1.39	1.51
Argillite		1				1	0.28	0.30
Quartzite			13			13	3.60	3.93
Rhyolite (red, Lynn volcanic)			88		1	89	24.65	26.59
Rhyolite (black/gray, Blue Hills)	1		158	3	3	165	45.71	48.04
Rhyolite (other)			9			9	2.49	2.72
Jasper			1			1	0.28	0.30
Total	2	1	328	20	10	361	100	100

Figure 27. Sample of flakes from EU11 (context 156) showing the range and relative proportions of different material types. Top: rhyolite (Blue Hills), quartz; bottom: rhyolite (Lynn volcanic complex), Mt. Jasper rhyolite quartzite, Coxackie chert.

also rare with only one point tip and one possible scraper recovered.

Native Ceramics by Leigh Koszarsky

Native ceramic fragments are less common in New England than lithics, but a total of 28 sherds of Native ceramic were found from the 2015 excavation at Burial Hill (Table 8). Twenty-four of the sherds were found in EU11 in the contexts 150, 156, 157, 162, and 164; the remaining four sherds were from EU14 and are included in this discussion. These pieces were very fragmentary and were quite thin. Many of the pieces were prone to disintegration even upon handling. Due to the very small size and coarse nature of the material, we were initially hesitant to call these pieces ceramic as they could have been caused by layers of sediment being pressed between reeds or leaves to create smooth sides. We examined these fragments carefully in order to determine if they were in fact Native ceramic and to record characteristics to use to compare them to other future samples from this and other sites. This analysis, along with the other Native artifacts present at the site, supports the interpretation of the presence of Native people at the site as well as shedding light on their activities there. The presence of ceramic sherds indicates that the deposits are from the Woodland period, but the pieces lack elements of the decorative styles and vessel shapes that Lavin sets out as diagnostic of different ceramic horizons and time periods (Lavin 2002: 157-164).

Methods

All artifacts identified as possible Native ce-

Table 8. Native ceramic sherds recovered in 2015 excavation units.

Excavation Unit	Context	Number of sherds
EU11	150	11
EU11	156	2
EU11	157	4
EU11	162	7
EU11	164	1
EU14	217	1
EU14	221	3

ramics in the field were bagged separately and not washed or dry brushed in the lab. In the lab, each fragment was individually examined under microscope using a stereo-zoom inspection microscope at 6x to 45x magnification by Leigh Koszarsky under supervision of Dennis Piechota. The fragments were then gently brushed with a paint brush to remove dirt in order to see the true coloration and texture of the body. Attributes like shape, coloration, coarse fractions, and number of faces were recorded as well as characteristics such as the presence of a worked surface or smoothed lip that would support the idea that these were once parts of a larger intentionally shaped form. Additionally, unique features, such as manmade markings or embedded organic material, were looked for and photographed if discovered.

Analysis

The fragments were relatively small. The largest fragment is record number 67 which was 24 mm long, 20 mm tall, and 6 mm thick. The smallest fragment was record number 56 which was 4 mm long, 5 mm tall, and 1 mm thick. The thickest fragment was record number 73, which was 10 mm thick. The clay of the fragments was coarse and low fired. Some of the fragments had sand inclusions. They were typically between 3 to 6 millimeters in thickness. Some fragments began to disintegrate even upon gentle handling, highlighting their fragile nature. Generally, they were a red brown or darker gray brown in color. Some of the fragments, such as record numbers 61 and 66, were a dark gray on one face and a red brown on the other.

Typically, one face of the fragments was smoother than the other, though frequently one of the faces was eroded away and rough in appearance. The one face of some fragments such as, 64 and 65, lack any voids or pitting entirely as if they had been deliberately smoothed or burnished even though the opposite face is rough.

Many of the fragments contained a sand temper, but in others no temper was present at all. The thickness of these fragments tended to be relatively thin, most of them around 4 mm in width. Thus they would not have required a temper to withstand the firing process and prevent cracking. None of the fragments had any visible shell temper.

All of the fragments had voids in them – most commonly they were blocky, or appearing as if they were shaped by an irregular hexahedron, but there were also spherical and ovoid voids as well as the less common tabular and cylindrical voids. The voids within the fragments provide valuable information as when they demonstrate distortion or flattening it can be evidence that the clay was worked. Record number 52 shows linear voids that appear somewhat distorted from the working of the clay. Additionally, the interior surfaces of the voids may contain reaction zones which are left by burned out organics or show impressions of burned out organics which indicate firing. Record number 50 had one void with tracheid impressions that could have been created by the impression of a woody matter. Record number 53 had the remains of a vegetable material within one of the voids. The tissue was curved with a visible cell structure arranged in a lenticular pattern. The plant material of this void indicates that other voids could have been caused by organic material, possibly included in the clay and typically burned out during the firing process. Voids can also be caused by off-gassing during firing as the ceramic body is drying out. The majority of the voids were likely created during this process.

One of our initial questions was whether these fragments were deliberately created by people or were created by layers of sediment being pressed between reeds or leaves to create smooth sides. However, if a piece was naturally formed it would be unlikely to have two smooth sides that lacked the impressions of plant material. Four of the

Figure 28. Incised Native American sherds, record numbers 55 and 59 (from EU11), and 75 (EU14) (left to right).

fragments of the assemblage have two smooth faces. On record number 52, there are microfissures on the surface, which is characteristic of the core drying out first during the firing process. That fragment also has a smoothed edge that looks like the lip of a vessel. Additionally, three of the fragments have impressed designs (Fig. 28). These fragments have a similar body consistency and coloration as the remaining fragments, showing that they are all ceramic. Record number 55 had an impression of a well-defined obtuse triangle. The clay at the point of the impression is curved as if the clay body had been dragged down by a tool. Record number 59 was incised with a chevron decoration on one face. These incised markings are very distinct from voids in appearance as they are symmetrical. Record number 75 has a shallow linear surface impression running down the entire length of the fragments. At 45x magnification, it is possible to see the shallow grooves within the line that were caused by the tool that created the marking. These deliberate markings make it evident that these pieces were deliberately formed and were probably once part of ceramic vessels.

Results

The fragments in this assemblage likely are examples of Native ceramic sherds. The signs of manmade manipulation of the ceramic, such as the designs impressed into the ceramic body and the smoothed edges on some of the sherds, are highly characteristic of ceramic that has been intentionally shaped and fired. Additionally, the archaeological context of most of the fragments, EU11—which contains almost exclusively Native lithics, corroborate that these are indeed Native-made. The combination of thinness and low firing temperature suggests that vessels made from this material would not be very strong, and likely unreliable in storing liquids, making these vessels likely candidates for dry goods instead.

EU12

EU12 (1 x 2 m) was positioned to intercept the foundation of one of Zenas Leach's stables. GPR data of the area returned a strong reflection that corresponded to an outline of a building from the 1874 Beers map. EU12 was placed to provide information about the construction and demolition of the stable, and to evaluate the impact of that construction and demolition on the landscape. At approximately 1.15 meters below datum, the foundation wall was discovered (Fig. 29). The foundation wall of EU12 is believed to be a continuation of the building wall excavated in EU3 in the 2014 field season. The building's construction disturbed any earlier remains in close proximity. Unlike in EU3 where the cut for the foundation wall was found close behind (west of) the wall itself, all the material in EU12 west of the wall was backfill within the construction cut. We reached the limits of safe excavation before reaching subsoil.

EU12 Artifacts

A large portion of artifacts from EU12 (Tables 2 and 3) consisted of architectural materials, such

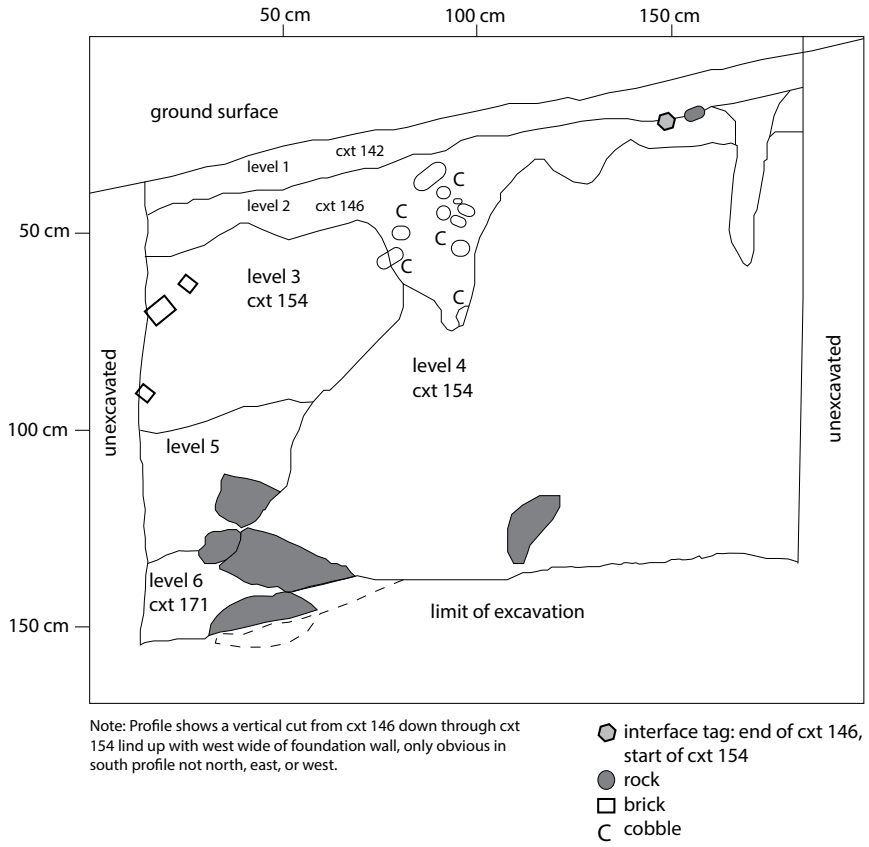


Figure 29. South wall profile of EU12.

as brick, glass, and slag. Overall, density of artifacts was low but also decreased as the depth of the unit increased. One artifact of note is a copper alloy and silver coin, 17.53 mm in diameter, found in context 154. Dennis Piechota examined the coin's composition using pXRF and determined that the coin's surface is primarily copper (80-90%) with some silver content (5-8%). The interior of the coin may have a higher percentage of silver which has corroded away from the surface. The artifact is well worn on both sides, but Piechota was able to generate images taken under raking light that reveal some of the detail (Fig. 30). While we have not yet identified the coin specifically, the cross with balls at the terminals is unique to coins minted in Mexico City in the 17th century (Jordan, http://www.coins.nd.edu/ColCoin/ColCoinIntros/Sp-Cobs.intro.html; see also the Mexican examples in Craig 2000). We have sent the image of the coin to several specialists in Spanish colonial coinage to try to get a specific identification. For the moment, this seems to be a 17th-century artifact in a disturbed context with no other contemporary artifacts in the same deposit.

Thatcher's (1835: 88) extracts from the Plymouth Town Records include this account:

> Great agitation was occasioned in Plymouth this year [1646] by the arrival of Capt. Thomas Cromwell, with three ships of war, bringing with them several rich prizes, taken from the Spaniards… Gov. Winthrop represents it as a special interposition of divine providence that Capt. Cromwell's squadron should have been compelled by stress of weather to put into the harbor, as, during their continuance of fourteen days, they spent liberally and gave freely to the poorer sort.

We are not claiming this event is the source of the coin that we found, but it represents one of several ways that Spanish coinage could have made its way into the Plymouth colony.

Figure 30. Obverse and reverse of a 17th-century coin recovered from context 172.

EU 13

This unit was intended to be just outside the 19th-century building footprints; it should have been located just behind (west of) Zenas Leach's stables, near the lot boundary with the 18th-century school. However, excavation results show that it was within the cut made when demolishing the buildings later in that century. Layers of coal ash, and inclusions of slag, brick, and plaster support this hypothesis. The unit did not reach subsoil. An interesting red clay pipestem was recovered from context 145, part of the topsoil layer (Fig. 31). It is undecorated and has a bore diameter of 6/64 inches. It is otherwise unmarked. Red clay pipes are typical of colonial Virginia and found occasionally in colonial New England. Small industries were established in the early 17th-century Virginia (Luckenbach and Kiser 2006), suggesting that specimens found in New England reflect intercolonial trade, although they may have also been produced in Charlestown, Massachusetts (Baker 1999). Some speculate that red clay pipes served as a substitute for European white kaolin pipes lacking during the English Civil War (Miller 1991).

Context 172 in the bottom of this unit contained a mostly-intact, large, tinned iron barrel (Fig. 32). It has a three-quarter hinged lid. Raised rims around its edges and indications of body paneling are present. These traits and the thinness of the body suggest that it functioned as a storage container. EU 13's proximity to remains of 19th century livery stables, barns, and outbuildings might indicate that it contained grain, animal feed, or other such agricultural supplies. We were not able to find any parallels in agricultural supply catalogs, but did find a similar barrel, identified as a grain storage barrel, for sale by an antique dealer who had repurposed it as an end table.

EU15 and EU16

EU15 and EU16 were placed in front (east) of

Figure 31. Red clay pipestem from EU13, context 145.

a partially above ground crypt, built in 1833 based on the inscription on the front (see also Kingman 1892: 291). These units were outside the footprint of the 19th-century building foundations. EU15 was opened first and encountered a dense trash deposit unlike any others encountered on Burial Hill; EU16 was opened to explore the extent of this deposit (which proved to be limited in area and did not extend to EU16). Below this surface deposit, however, the lower layers of EUs 15 and 16 told much the same story of massive reland-scaping that we saw in EUs 12 and 13. In these units, we reached C-horizon subsoils at 105-140 cm bs in EU15 and 120 cm bs in EU16. The sedi-ments over the C-horizon sand were fill deposits, not a natural soil profile. This means that at some point prior to the mid-19th century, someone had cut into the hill in this area and scraped down to the C-horizon sand, removing all of the original layers above that. This was unexpected in this location since it is well outside the footprint of the buildings, so this would not have seemed to be an obvious or necessary step in their construction. It is possible that this reflects reshaping this area of Burial Hill as part the construction of the burial crypt just to the west.

The upper layers of EU15 (contexts 159, 161) contained a dense, mixed artifact deposit unlike most of the other, low density deposits excavated elsewhere on Burial Hill (Fig. 33). This deposit

Figure 32. An excavator measures the storage barrel within context 172.

began immediately below the modern sod and contained coal, slag, more than 1,000 nails, many pieces of unidentified, corroded iron, butchered animal bone from deer, sheep, pig, and cow and several hundred fragments of glass and ceramic vessels. Diagnostic artifacts provide a TPQ of ca. 1850. Beneath these layers (Fig. 34) was a thick fill deposit with a low artifact density (contexts 180 and 193). There is no buried A horizon in this unit, so our interpretation is that the natural depos-its above context 204, the C horizon subsoil, were scraped away, a thick fill was brought in, and the area was capped with this artifact rich deposit.

EU 16 was placed directly south of EU 15 to see whether the deposit in contexts 159 and 161 continued to the south. However, we found that deposit tapers off sharply to the south. Context 170 was the modern topsoil of this unit. The gravel inclusions were likely deposited to prevent erosion until grass was fully incorporated. This and other contexts within this unit were interpreted as fill de-posits with the exception of contexts 195 and 198 which were sterile C horizon subsoil (Fig. 35).

Figure 33. Mapping the locations of artifacts within the trash scatter.

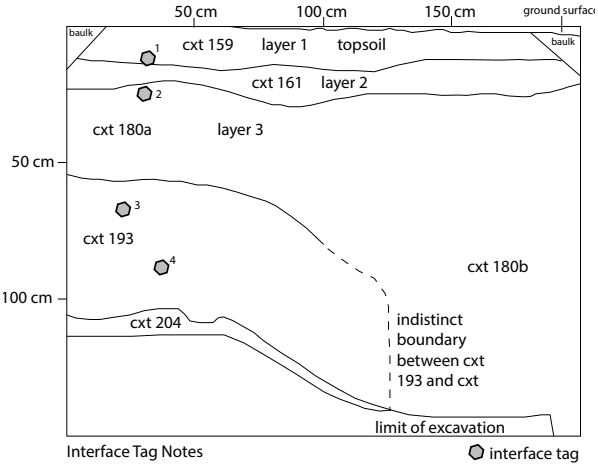


Figure 34. EU15 west profile.

Context 186 in the middle of this unit contained a more organic soil than the other contexts. Its stratigraphy and artifact assemblage suggest that it was a historic ground surface, perhaps a landscaping fill that was exposed as a surface for some time. Just below this context a deep cut appeared in the stratigraphy between contexts 191/202 and 195/198. It ran from the unit's northwest corner into the east wall by the southwest corner. Its total depth is unknown. This removed all of the historic deposits that were present. This coupled with the fact that there were no natural buried A or B horizons suggests that, like EU 15, all of the older cultural and natural layers seem to have been scraped away, likely during the 19th century, and covered with a new layer of fill.

Artifacts from the Trash Deposit

The deposit in contexts 159 and 161 in EU15 contained a wide variety of artifacts. Ceramic types include redware, English and Chinese porcelain, American stonewares, whiteware, pearlware, and ironstone. The presence of ironstone indicates a TPQ of at least the late 1830s (Jefferson Patterson Park and Museum). Three artifacts provide more specific date ranges. First, pieces of a molded figural flask were found within contexts 159 and 161 (Fig. 36). Frontal pieces show an eagle standing atop a garland with the word 'Liberty' arching above. The bottle reverse has the letters 'NN' and 'NGT.' Together these indicate a bottle type manufactured by Willington Glass and Co.

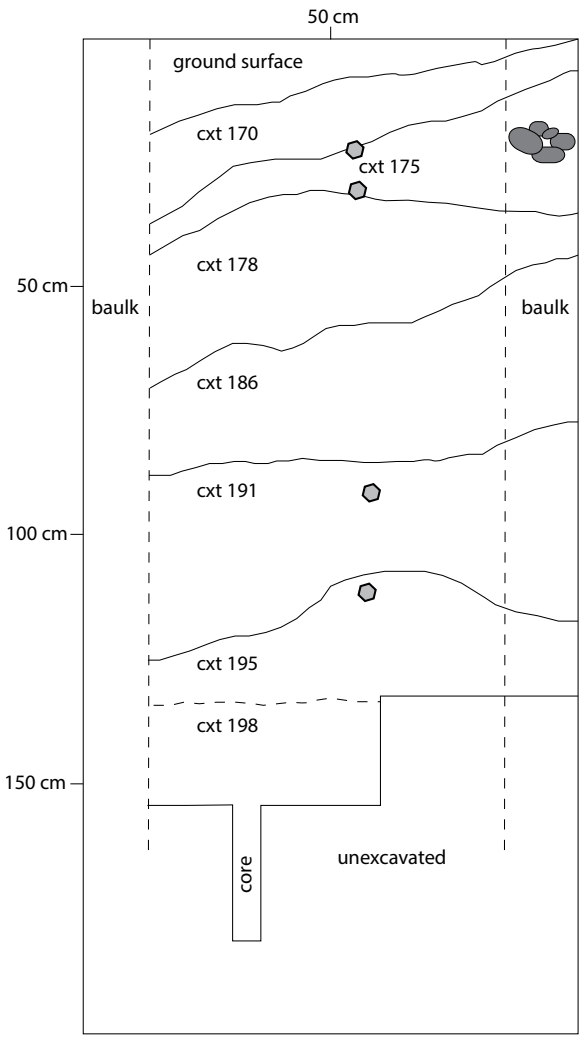


Figure 35. EU16 south profile.

Figure 36. Three mended pieces of the Willington and Glass Co. flask.

based in Willington, Connecticut (McKearin and Wilson 1978:570-571, type GII61-65; Museum of Connecticut Glass), probably manufactured in the 1850s (as determined by McKearin and Wilson 1978: 444). The Willington Glass Company operated between 1815 and 1872-73, but their primary years of production seem to have been between 1847 and the early 1860s (Switzer 1974: 73). The second diagnostic artifact was a 1818 one cent piece found within context 161 (Yeoman 1970:72). The date is clearly inscribed with a female Liberty figure head on the obverse. Finally, a copper button within context 180 is stamped with 'L & Kendrick Co.' Leavenworth and Kendrick operated out of Waterbury, Connecticut, from 1829 to 1835. Together these artifacts form a mid-19th-century assemblage with a probable TPQ of ca. 1850 based on the Willington flask.

We recovered a total of 202 bones from this EU15, with 80% of them coming from context 161, the main trash deposit. The sample of animal bones was highly fragmentary, with less than a third being identified to the species level. The animals identified in this analysis were deer, sheep, pig, cow, and a small mammal that could possibly be a rabbit or a raccoon (Table 9). Cattle made up the largest group of identifiable bones, with both an adult and a calf being represented. There was a high number of animal vertebrae in the assemblage, over half of which were from a cow or other large mammal. Approximately 12% of the bones exhibited butchery marks from food preparation.

Table 9. Animal bones recovered from EU 15. NISP is the number if identified specimens; MNI is the minimum number of individuals; Biomass is an estimate of total weight based on bone weight. Analysis by Katie Wagner.

Taxon	Name	NISP	% NISP	MNI	% MNI	Weight (g)	Biomass	% Biomass
Odocoileus virginianus	Deer	1	0.7%	1	16.7%	45.4	352.96	15.8%
Caprine	Sheep or goat	7	4.7%	1	16.7%	31.5	253.09	11.3%
Bos taurus	Cow	20	13.5%	2	33.3%	128.3	908.44	40.7%
Sus scrofa	Pig	1	0.7%	1	16.7%	2	20.59	0.9%
Large mammal		10	6.8%			31.5	253.09	11.3%
Medium Mammal		104	70.3%			57.2	435.55	19.5%
Small Mammal		5	3.4%	1	16.7%	0.9	9.96	0.4%
Total		148	100.0%	6	100.0%	296.8	2233.69	100.0%

Printing Type

We found three pieces of printing type, each in the upper layers of three different units (EU14, context 141; EU15, context 151, and EU16 context 178) in the landscaping fill brought in after the buildings were demolished. These are all discussed here under the heading of EU15 and 16, recognizing that the dispersal of this relatively uncommon artifact type suggests that the fill over this whole area has a similar source and depositional history. This suggests that the type dates to before 1885, when the filling of this area was completed, consistent with the dates of the associated artifacts. The letter S was the only piece we recognized in the field; the other two pieces, recognized in the lab, are punctuation and possibly a spacer used for adding space between words or at the ends of lines, so are much thinner and lack the give-away of a letter at one end (Fig. 37). Their distinctive form with feet and side nicks indicates that they are type.

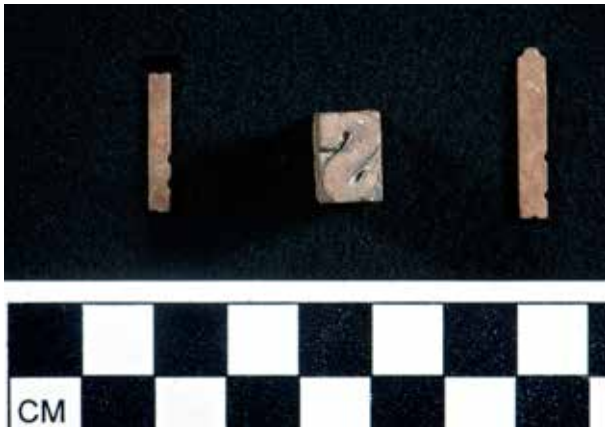


Figure 37. Printing type from EUs 14, 15, and 16.

The three pieces that we have are a bold, serif, upper-case S (abt. 36 points), a punctuation mark (abt. 12 points), and a spacer or punctuation mark (abt. 9 pts). The printing end of the last piece is broken off, which makes it impossible to tell if it is a punctuation mark or a spacer. Since lines of type all need to be the same length, spacers came in a number of different thicknesses, depending on how much space was needed to even out the line. Very narrow spaces were hair spaces, followed by fractions of an em (3 to the em, 4 to the em), then en quads, em quads, and multiples such as two-em and so on. In the late 19th and early 20th centuries, an em was a square whose size was defined by the point size of the font (Stewart 1918: 19). Most type from this period is made of a mixture of lead and antimony, sometimes with tin or copper (Stewart 1918: 7; Updike 1922: 13).

The features that indicated that the pieces are type (other than the obvious letter S) are the feet (the small points on the short end) and the nicks (the grooves on one of the long sides). Different fonts had different numbers and placement of nicks. When all of the pieces were of the same font, the nicks formed a continuous groove in a line of set type (Stewart 1918: 8-9); pieces of type

Figure 38. EU14 looking south showing the dividing line between the fill soils (northeast portion of the unit) and other deposits (southwest portion of the unit).

from other fonts could be recognized by the break in the line of nicks. Our three pieces have different patterns and placement of the nicks.

Since type is such an unusual artifact, and the pieces we found were distributed across a several meter area, one of our hypotheses is that we might be able to identify potential sources of the fill used to level this area by finding the locations of print shops in ca. 1880 Plymouth. The 1887 Plymouth Directory (Hogan 1887), the first published for Plymouth, lists two printers: Avery and Doten, publisher of the *Old Colony Memorial* newspaper with an office on Court Street near the corner of North St, and D. W. Andrews, publisher of the *Plymouth Free Press* with an office on Middle Street.

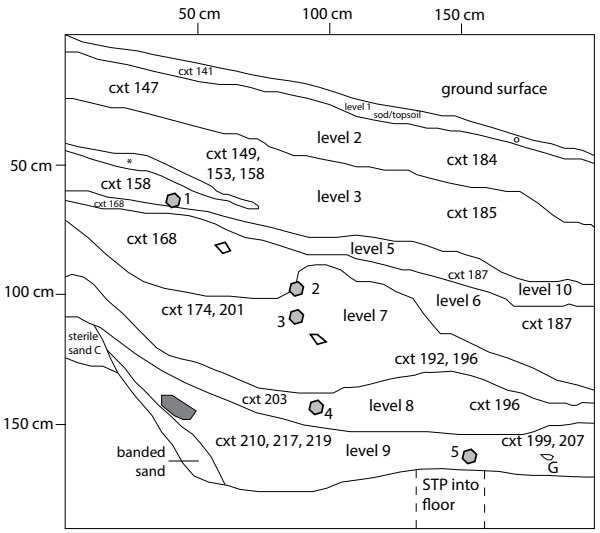
EU14 and EU18

EU14 was located behind (west of) the 18th-century school on School Street, the building labeled "Engine House" on the 1874 map (Fig. 4) and east of the crypt. As we excavated EU14, it became clear that we had found the edge of a large cut into the hill side (Fig. 38, but west of the cut, there were more intact deposits including intact subsoil with a feature (a pit or trench) cut into it. In order to understand the edge of the cut, we laid out units east and west of EU14. We excavated EU18, to the east (towards the street), and laid out but did not excavate EU17 to the west (towards the crypt). We will probably return to EU17 in 2016. EU18 contained almost exclusively the fill of a large cut in the hill that ran from the mid-point of the south wall to near the west end of the north wall (Figs. 39 and 40). In the south profile of EU14/18, we could in fact see two cuts: one associated with the building construction and one with its demolition. The demolition cut began inside (east of) the construction cut, but quickly crossed it, erasing all traces of the construction cut in most of the unit. Only one cut, the demolition cut, is visible in the north profile, and most of the fill consequently was probably deposited when the school building was removed in the late 1870s or early 1880s. That fill contained a small number of 17th-century artifacts, however, particularly in its lower levels, indicating that the filling process had disturbed a 17th-century deposit.

In addition to the larger cuts, there were two features. One of these was a post hole and mold that seem to relate to the construction of the school. The other, in the northwest corner of EU14, was a small pit or trench that had been truncated on the east by the cut for the school building and ran into the wall of the unit on the west (into the unexcavated EU17). The following section discusses the cuts, features, and strata visible in the unit from earliest to latest.

17th-Century Pit or Trench and Overlying Deposits

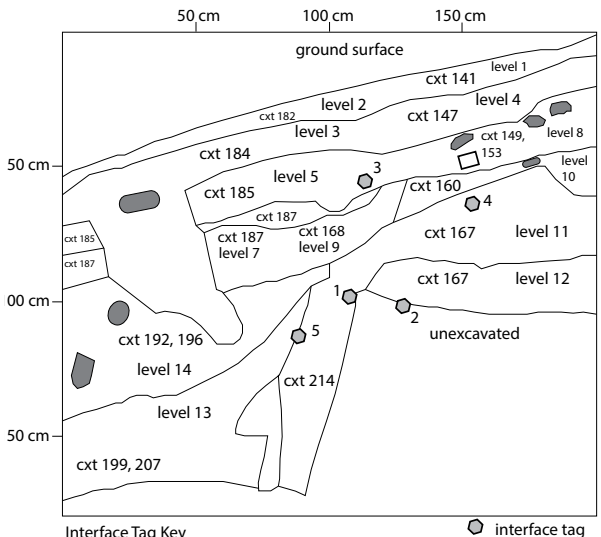
At just over 90 cm below the ground surface, we identified a preserved segment of a pit or trench feature in EU14 (context 221, see Figs. 41 and 42). The feature had straight, roughly parallel sides and a sloping bottom. The segment visible to us (26 cm E-W) was truncated on the east by later cuts for the demolition of the school build-



Interface Tag Notes

1: 5 photogrammetry
2: bottom of context 168, top of context 174
3: 8 photogrammetry
4: bottom of context 201, top of context 203
5: bottom of context 199, top of context 207

Figure 39. North profile of EUs 14 and 18.



1: top of cxt 212
2: bottom of cxt 167, top of cxt 211
3: bottom of cxt 153, top of cxt 158
4: 7 photogrammetry
5: bottom of cxt 192, top of cxt 212

Figure 40. South profile of EUs 14 and 18.

ing and on the west ran into the sidewall. It had a maximum depth of 14 cm, and was 44 cm wide at the point at which it intersected with the sidewall. The feature was cut into subsoil, and the fill was a compact dark brown sandy silt (10YR 3/3 mottled with 10YR 4/6 silty sand). The feature contained 3 pieces of Native American ceramic, 2 fragments of charcoal, 8 of shell, and a concentration of small pieces of corrosion material. This material, which was greyish-white in appearance, was identified by Dennis Piechota using pXRF analysis as a mixture of lead and tin, suggesting that it could have been pewter or solder that has now corroded. The fragments that remain have no identifiable form. We took a soil sample from this context for flotation, but there were no preserved botanical remains. Given the mixture of Native ceramics and a metal artifact and the feature's stratigraphic position, we hypothesize that this is an early 17th-century feature.

Some of the fill of this feature seems to have been dragged down into the adjacent cut (Fig. 42). We excavated two adjacent contexts (217, 219) of material of a similar color, but less compact, and sitting over fill soils, just inside the edge of the cut. These contexts contained lithic flakes, olive green and dark green window and bottle glass, nails, and brick fragments. Some of these, particularly the glass, may also be 17th-century artifacts.

The profile of the strata above context 221 suggest a stratigraphic break, maybe caused by scraping. Context 167/level 10 (Fig. 41) appears to be a heap of redeposited subsoil with a low artifact content. Adjacent to it is context 174/level 11, a dark brown deposit that contains 7 pieces of creamware, suggesting a later 18th-century deposition date. It also contained a partial dark green case bottle base. Context 174 may represent the remnant of a ground surface that was in use while the school was in operation. It also is truncated on the east by the cut made when the school was demolished. The absence of a buried 17th century ground surface here also suggests that the area was scraped at some point in the past.

Construction cut and post hole

Looking at the south wall profile (Fig. 40), two steep cuts are visible. The westernmost one of these, the line between the unexcavated subsoil and context 214, seems to be the cut made

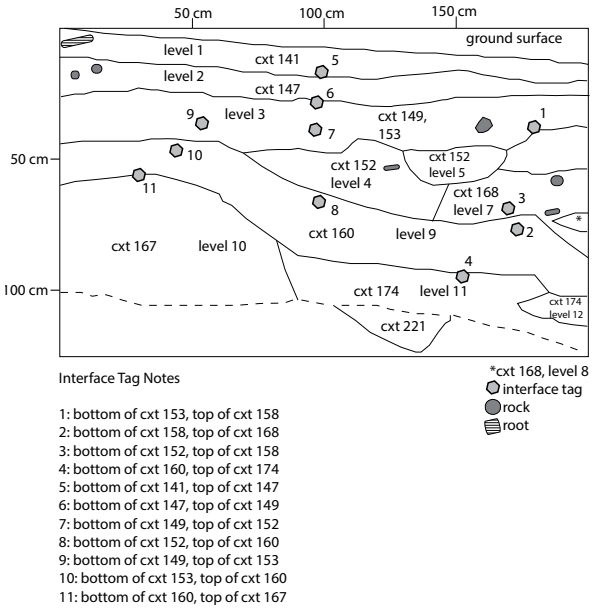


Figure 41. West profile of EU14 showing the early pit or trench feature, context 221.

Figure 42. Early pit or trench in EU14. A) Plan view; the feature itself is the dark, roughly rectangular segment that runs into the west wall. The more amporphous dark soil running into the north wall is disturbed feature fill that was pulled down into the cut made in the late 19th century. B) Oblique view showing again the intact feature segment running into the west wall and displaced material from the feature pulled down into a later cut.

when the school building was constructed in the 1760s. This older cut is only visible in the south wall, because it was erased by the later demolition cut throughout most of the rest of the unit. Cut partially into the subsoil and partially into the banded silt and sand that filled this cut was a large post hole and mold with a compact clayey sand lining and darker post mold (excavated as contexts 211-214 and 216). The post hole had also been cut by the later 19-century demolition cut, so only a portion of it was preserved. Estimating from the remaining portions, it was an oval of possibly 40 x 60 cm. The fill had a low artifact density and lacked diagnostic artifacts to date it. Based on its stratigraphic position, however, it is associated with the lifespan of the school, since it is partially set into the cut excavated to build the school. It may have been a structural post for the building.

Demolition Cut

The dominant deposit in these two units was the fill of the cut made when the building was demolished (Fig. 38). The fill layers were highly varied in color, alternating between light colored sandy levels with a low artifact content and darker, more silty levels with a higher artifact content. These fill deposits made up almost all of EU18 and about half of the area of EU14. Looking at the south profile, these fill deposits include contexts, 168, 187, 192, 196, 199, and 207. Other fill strata were identified in the field but are not visible on the south profile. These deposits contained primarily architectural material (granite spalls, window glass, nails, brick fragments), coal and furnace scale, and slag, with smaller amounts of bottle glass, ceramics, and small finds, all in small fragments representing a secondary rather than

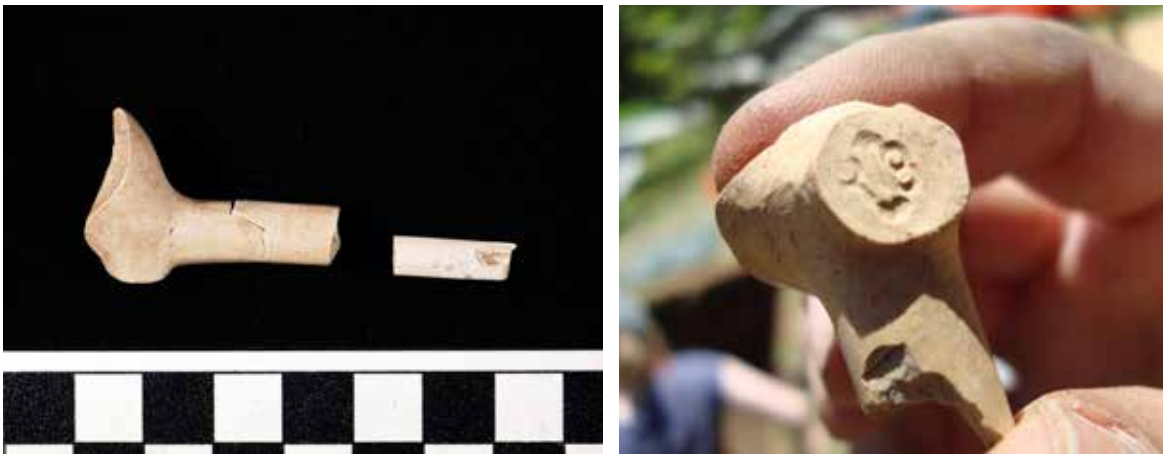


Figure 43. RB marked smoking pipe from EU14, profile and detail of heel mark.

primary deposit. We did not reach the bottom of this fill material in EU18 except in a test pit that went an additional 40 cm below the level of the unit floor.

LANDSCAPING LAYERS

Capping the fill layers were landscaping layers that covered both units, placed after the school was demolished ca. 1880, and modern topsoil. Looking again at the south profile, these are contexts 141, 147, 149, 153, 182, 184, and 185. Cut into context 153 was a pit feature with possible evidence of burning, filled with slag and charcoal. The landscaping layers contained a small number of displaced 17th-century artifacts including a sherd of Border ware (context 182) and a marked pipe (context 153; Fig. 43). The pipe had a maker's mark, an RB surrounding a dagger and a heart. The mark stands for Richard Berryman whose pipes were made in Bristol, England, between 1619 and 1652. Pipes with the same mark were found in Ferryland, a 17th-century English colony in Newfoundland (http://www.colonyofavalon.ca/), and another example may have been found during the 1972 excavations at the Allerton/Cushman Site (C-21). Because this pipe was found in a landscaping layer, it may not have originated from a deposit on Burial Hill.

Future Work in this Area

These units yielded several 17th-century or potentially 17th-century artifacts in mixed contexts, in addition to a partial early 17th-century feature. Even though the numbers of 17th-century artifacts are very small, they are more concentrated here than they have been in other units along Burial Hill which suggests that this unit is near or inside the 17th-century settlement. There is more area here for us to investigate next year, but it is constrained by the crypt to the west, the stairs up Burial Hill to the south, and the cut for the 18th-century school to the east. We have identified the eastern edge of the area of preservation, but still need to identify the other next season.

Conclusions

The 2015 season reinforced some of the conclusions that we made based on work in 2014, but also yielded several areas with early intact deposits. As we found in 2014, the large school and stable buildings cut deeply into the hillside, removing any earlier deposits within their footprints. We found this year that in a number of cases the construction or demolition deposits continued well behind the building foundation wall (EUs 12, 13). However, there are areas behind (west of) those buildings where early deposits are preserved. EU11, which was an intact Native deposit, possibly from a Woodland period tool making workshop is one of these. The flakes from this site are predominantly local rhyolites; only one partial tool was found. There were also 24 fragments of Native pottery which were examined in detail. This excavation unit is significant because it adds

a Native component to the Burial Hill, a National Register property. The site is truncated on the east by the 19th century buildings, but continues an unknown distance north and south, and may continue west between the marked burials. We do not plan to excavate any more of this site.

The other preserved early deposit is a section of a potential 17th-century pit or trench identified in the westernmost portion of EU14. This deposit contained Native ceramic fragments and corroded metal, possibly pewter or solder. We plan to return to this area in the 2016 field season. The presence of this feature and a small number of 17th-century artifacts in the fill deposits above it (including Border ware and a marked smoking pipe) suggest that the units at the southernmost end of School Street fall within or near the 17th-century settlement core, since we did not find comparable numbers of early artifacts in units to the north in 2014.

These results also continue to provide information about the changing landscape and topography of what is now downtown Plymouth. Two of the early deeds for private ownership of the land along School Street mention embankments or retaining walls at the western edge of the property, separating the private parcels from the Burial ground. The evidence of deep scraping and filling in EUs 15 and 16 may be related to late 18th or early 19th-century activities to create these early embankments or terraces. At the north end of School Street, there are preserved archaeological deposits on the back yards of houses demolished in the early 20th century.

Envisioning Past Landscapes

Two years of excavation along Burial Hill provide evidence for a series of past landscapes, that we can now envision and describe in greater detail. Before this area was known as Plymouth, it was the Native Wampanoag village of Patuxet, with settlement along Town Brook, the coast, and extending to what is now Burial Hill. Part of Burial Hill was a tool making workshop where quartz and rhyolite cobbles collected from the beach were flaked into stone tools. The workshop probably did not stand in isolation, but was near houses and cooking fires, part of the larger settlement of Patuxet.

After English colonists arrived in 1620, they began to transform the area into a colonial town. Between 1621 and 1677, the palisade wall that surrounded the colonial Plymouth settlement probably crossed what we now call School Street. Running down from a fort at the top of the hill, the wooden palisade surrounded the small town, enclosing houses, a town square, and small garden plots. After the end of King Philip's war, the palisade was taken down. Fort Hill, now called Burial Hill, became the location of a cemetery with the oldest standing gravestone dating to 1681. Burials were added to this cemetery throughout the colonial period. In the mid-18th century, the Town of Plymouth constructed a school at the south end of the street, and at the end of the century began to sell additional plots of land. The lots were about 30 feet deep, and in some places a wall or an embankment separated the burial ground from privately owned land.

A walk down School Street in the middle of the 19th century would have taken you down a busy city street—past two schools, three stables, and half a dozen houses, most with the front door at street level and the back walls cut deeply into the hillside. The stables were large wooden buildings with stone foundations, blocking the view of the burial ground behind them. Archaeological evidence indicates that all of the activity focused on the street; in most places no trash built up behind the buildings. Some, like the A. C. Chandler and Sons Livery Stable, were set up to rent or sell horses and carriages. Others, such as the Harlow and Bailey building, were auxiliary spaces for businesses on Main Street. Starting in the 1880s, these buildings were demolished and their footprints filled, creating the open grassy area seen there today. Part of the motivation for this beautification program was to commemorate historic Plymouth and the early settlers in the years leading up to the 300th anniversary of the colony in 1920.

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