Archaeological Excavations in the East Garden, Stratford Hall Plantation, Westmoreland County, Virginia

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Submitted to

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Revised
December 2013

Executive Summary

The Robert E. Lee Memorial Association contracted with Dennis Pogue to undertake archaeological excavations in the restored East Garden at the Stratford Hall plantation National Historic Landmark property. The main goals of the project were to reveal the soil conditions in selected areas of the garden in order to determine the level of preservation for the archaeological remains, and to assess the potential for those remains to yield evidence useful in reinterpreting the space. A particular focus of this effort was to explore the nature of a complex of features that had been revealed during excavations that were conducted in the garden in the 1930s (Beaman 2002, McFarland 2004 and 2005, Sanford 1999, Williams 1975). The first phase of field work was accomplished between April 1 and April 12, 2013; the second phase was carried out between September 23 and October 4, 2013.

The findings of the archaeological excavations that were carried out between 1930 and 1932 served as the basis for developing the garden restoration plan, which was largely completed by 1934. Although a succession of modifications have been made to the space over the intervening decades, the overall layout remains remarkably true to the 1930s plan (Garner 1994, McFarland 2005). The focus of the recent work was in the upper terrace, where five substantial features had been revealed in the summer of 1932. Although identified at the time as likely related to an earlier garden, they were not excavated or fully recorded, and their existence was not taken into account when the restoration design was formulated by Morley J. Williams in October of that year (McFarland 2005, Williams 1975).

A total of 22 5x5ft test units were excavated over the course of the two phases of field work. In April 2013, 10 units were aligned to form two 25ft-long trenches, spaced 5ft apart, positioned to intersect with four of the five features. An additional 12 5x5ft test units were excavated during the second phase of investigations. These were located to the south and west of the initial tests, positioned to intersect with the fifth feature and one of the linear beds, and to explore the soil conditions in the southern portion of the upper terrace. Nine of the units were aligned to form two 5ft-wide trenches, 30ft and 15ft in length; the trenches were oriented on the north-south axis, as were the earlier excavations. A single 5x5ft unit was excavated to the south, and two separate units (expanded to roughly 5x7ft) were excavated to the west.

Portions of each of the four linear features were exposed in April, located precisely as indicated on the 1932-33 excavation plans (Williams 1932, Williams and Pinkney 1933). Three of the features are roughly 3.5ft in width (the fourth was not fully exposed), spaced 2.5ft apart, and oriented east-west in conformance with the overall garden layout. In 1932 the features were measured as approximately 45ft in length. During the second phase of work the west edge of one of the linear trenches was revealed, along with two edges (south and west) of the large rectangular feature that had been revealed in the 1930s. The locations of all five features correlate quite closely with the Williams plan.

The exposed portions of the five presumed garden features were mapped and fully recorded, with three of the five tested to determine their depths and profiles, and in hopes of recovering diagnostic artifacts. All three of the features exhibited a single stratum comprised of dark, silty organic soils. In all four linear features it was determined that the stratum of dark soils overlay a layer of brick rubble. Two of the features were tested, revealing that they are relatively straight-sided and flat-bottomed. The fifth feature is depicted on the Williams plan as roughly rectangular in shape with a truncated southeast corner, measuring approximately 35x45ft, and was described at that time as comprised of "Deep topsoil of old asparagus bed." The feature was uncovered in two locations, in the 30ft trench and in one of the test units located @22ft to the west, revealing portions of the west and south edges. A portion of the feature was excavated in each location, revealing it to be roughly 0.5-0.7ft in depth and flat bottomed, but lacking the stratum of brick rubble found in the linear features.

Based on comparative evidence found at other sites of 18th-century Virginia gardens which have been excavated over the last several decades, the five features are almost certain to represent the remnants of planting beds (cf., Luccketti 1990 and n.d., Samford and Brown 1990, White and Breckinridge 2010). Although artifacts were not found to assign a precise date for their creation, a combination of evidence suggests that they likely relate to the 18th-century garden design.

Samples of soil retrieved from two of the linear beds were subjected to testing for the presence of pollen and phytoliths (plant stones). Those results are suggestive if difficult to confirm, with the discovery of elements likely representing animal manure providing support for the identification of the features as planting beds (Cummings and Ladwig 2010).

Six smaller test units were excavated within the two lower terraces in hopes of gaining insights into the soil conditions found there. Given the tiny area sampled, the findings are predictably difficult to interpret, and suggest that only the expenditure of a significant effort to investigate this portion of the garden is likely to yield useful results.

Research Design and Background Investigations

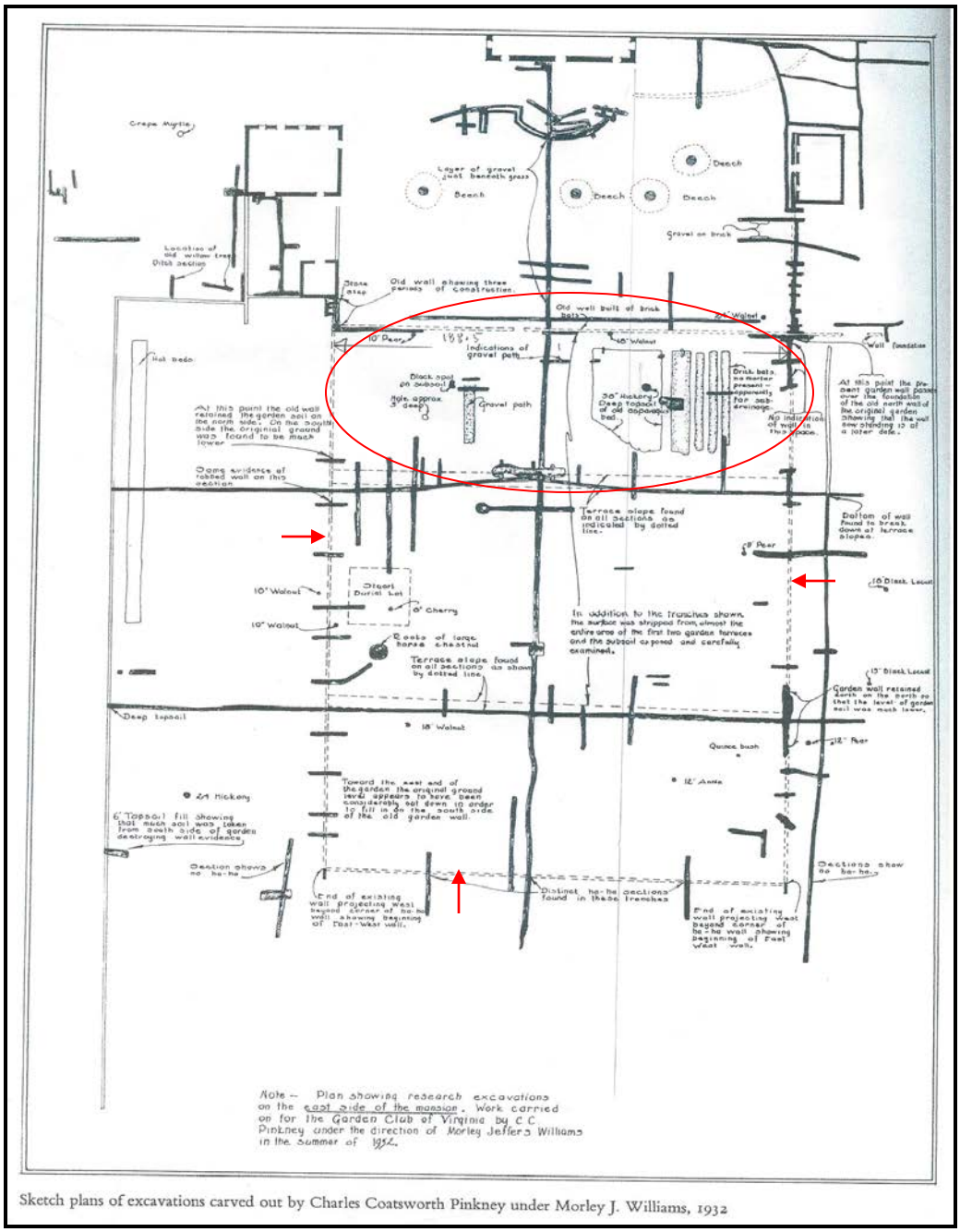
The research design guiding these investigations was developed with reference to the various records relating to the excavations undertaken in the 1930s (cf. Garner 1994). Based on that review, two primary questions were formulated for testing. First, what is the condition of the soil strata in the three terraces, and, in particular, had the soils been stripped in the two upper terraces down to subsoil and then backfilled? And second, did the complex of possible garden features that had been revealed in the upper terrace area survive and, if so, was it possible to determine their function and age? The specific findings and the interpretations of the work carried out in 1930-32 that framed the formulation of the research design are summarized below.

1) The reconstruction of the brick boundaries for three sides of the garden (north, south, and east) appears to be based on credible evidence and does not warrant reinvestigation at this time. The finding that the garden was bounded on the east by a Ha-ha (sunken) wall appears to be particularly compelling. Substantial masonry remnants were revealed and documented by Shurcliff in 1930, then were re-examined by Claiborne under the auspices of the Garden Club of Virginia (GCVA) in 1931, and yet again by Williams and Pinkney in 1932. The strong consensus of the investigators was that the remains related to the Ha-ha, and a review of their field records supports that conclusion. Neither Shurcliff nor the GCVA found what they believed to be compelling evidence for the existence of the north and south boundary walls. Williams came to the opposite conclusion based on the findings of his field work, however, which revealed numerous traces of the north wall in particular, and that interpretation appears well supported.

2) The question of whether the garden had been divided into three sections, each forming a terrace separated from the others by sculpted narrow sloping strips of ground (or falls), seems to have been effectively answered in the affirmative. According to the 1931 report, at that time subtle undulations of the ground surface inferred to be vestiges of the terraces could be discerned by visual inspection, and the topographic map that was prepared to test the proposition gives credence to that interpretation. Williams sought to confirm the existence of the terraces by excavating lateral trenches intersecting the hypothesized locations of the falls, and he revealed what he concluded were clear remnants of the sloping surfaces. Williams also claimed that he found evidence for what he interpreted to have been a ramp positioned roughly in the middle of the north-south line of at least one of the falls, presumably to accommodate the central pedestrian path.

3) Williams noted the discovery in the upper terrace of four linear features (ranging between 3.5ft and 7.0ft wide and approximately 45ft long), at least one of which exhibited a significant quantity of embedded brick bats, which he interpreted as "drainage trenches." He also revealed a large (approximately 35x45ft) roughly rectangular feature in the same half of the terrace, and oriented along with the linear trenches, that he described as comprised of "Deep topsoil of old asparagus bed." The features apparently were found at some depth below the ground surface and intruded the natural clay subsoil. Features matching these general descriptions have been revealed at several sites of 18th-century gardens in Virginia which have been excavated by archaeologists over the last 30 years, giving credence to the interpretation that they relate to an earlier garden design.

4) On his plans Williams indicates the locations of the trenches that he and Pinkney used to explore the garden. But on his 1932 sketch plan he also noted that, "In addition to the trenches shown, the surface was stripped from almost the entire areas of the first two garden terraces and the subsoil exposed and carefully examined." It apparently was the stripping that allowed the investigators to reveal the full extent of the five garden features. If the areas were stripped as extensively as indicated, that means that the existing soils that overlie the subsoil throughout both terraces have been disturbed and backfilled, and therefore they do not offer any potential for yielding important archaeological evidence pertaining to the garden.



Sketch plans of excavations carved out by Charles Coatsworth Pinkney under Morley J. Williams, 1932

Figure 1. Plan of excavations carried out in the East Garden under the direction of Charles Pinkney and Morley Williams (1932). The area highlighted in red denotes the location of several features found in the upper terrace that were interpreted by Williams as likely garden features: five possible garden beds and two linear concentrations of compacted gravel identified as remnants of paths. The locations of the three falls, which divided the garden into the same number of levels, also are indicated, as are the conjectured tracks of the north and south boundary walls and the east Ha-ha (red arrows).

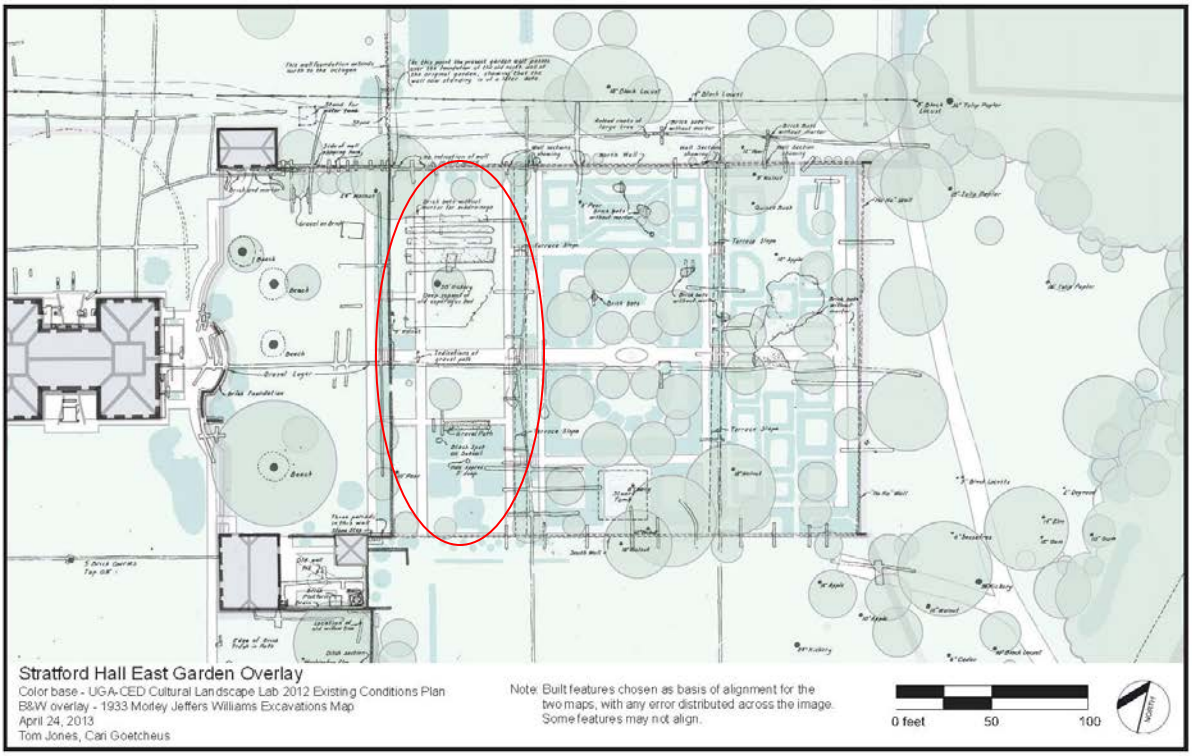


Figure 2. Stratford Hall East Garden Overlay (compiled by Jones and Goetcheus 2013), depicting the Pinkney/Williams excavation plan overlain onto an existing conditions plan of the garden area. The general extent of the upper terrace and the features revealed there in 1932 are bounded in red.

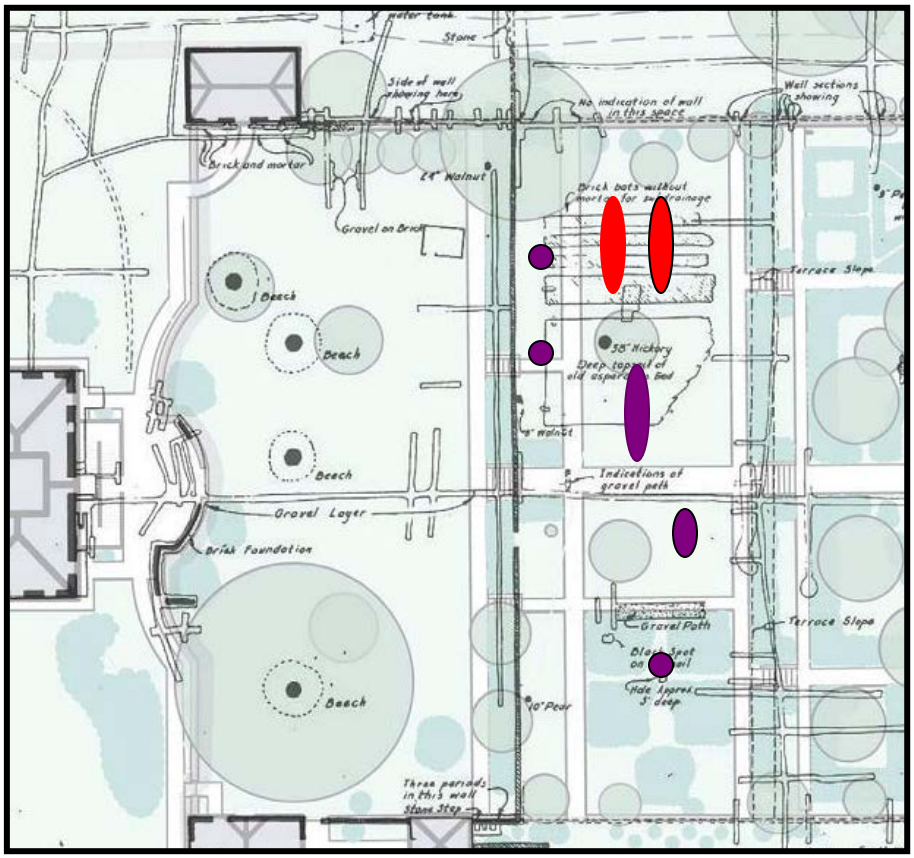


Figure 3. Detail of the Stratford Hall East Garden Overlay (Jones and Goetcheus 2013), with the general location of the test units excavated in April 2013 indicated in red; the general locations of the September-October 2013 excavations are indicated in purple. (North is at the top.)

Field Methods

The excavation methods employed are representative of the generally standardized professional procedures that have been developed to study historical archaeological sites in the Chesapeake region. The test units relate to an overall grid of the Stratford Hall Plantation site (44WM0309) that was first imposed in the 1990s by archaeologists on staff at the University of Mary Washington in conjunction with their ongoing summer archaeological field program. The recording system and forms used, as well as the unit and feature number designations assigned, were likewise borrowed from the same source. Scaled record drawings both in plan and profile were prepared and digital photographs were taken at selected points throughout the process. On a procedural level, the soils were excavated according to stratigraphic levels and generally were screened through ¼-inch-hardware cloth to standardize artifact recovery. Samples totaling approximately 7.5 liters of soil were taken from the large feature (F2013.59-60) and were processed through window screen-sized mesh using low pressure water spray in hopes of recovering any artifacts smaller than ¼ inch in size. All artifacts were retained for further analysis; brick

fragments (absent two measurable dimensions) were later weighed and discarded. Samples of soil were taken from strata within two of the linear features (F2013.01-02) and were subjected to specialized analyses.

Figure 4. Facing northeast with archaeological excavations underway in the East Garden in April; the two excavation trenches (units 542-546 and units 537-541) are visible on the left; crew members are shown screening excavated soils on the right.

Figure 5. Facing northwest during excavations in the East Garden, with the 15ft-trench (units 567-569) in foreground and the 30ft-trench (units 570-575) in the rear, September 2013.

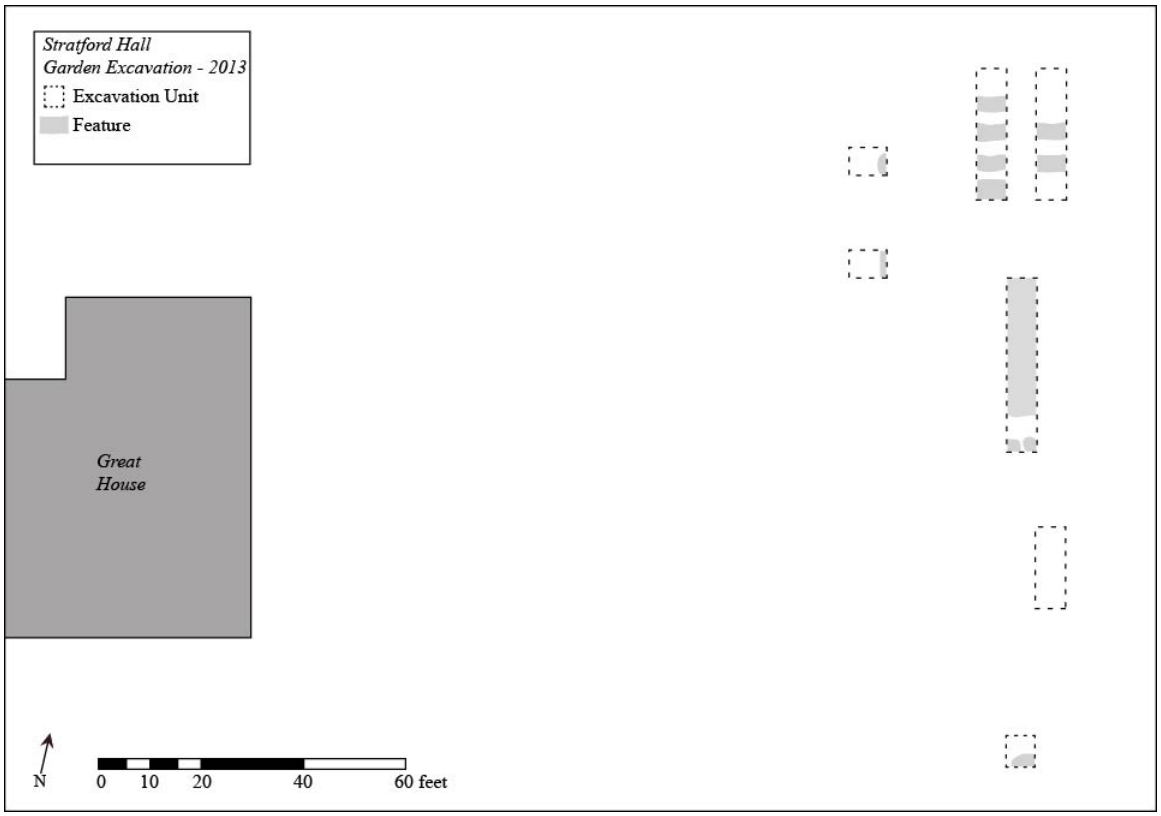


Figure 6. Plan of the placement of excavation units in the East Garden upper terrace, in relation to the Great House (prepared by Pecoraro); the major features are indicated.

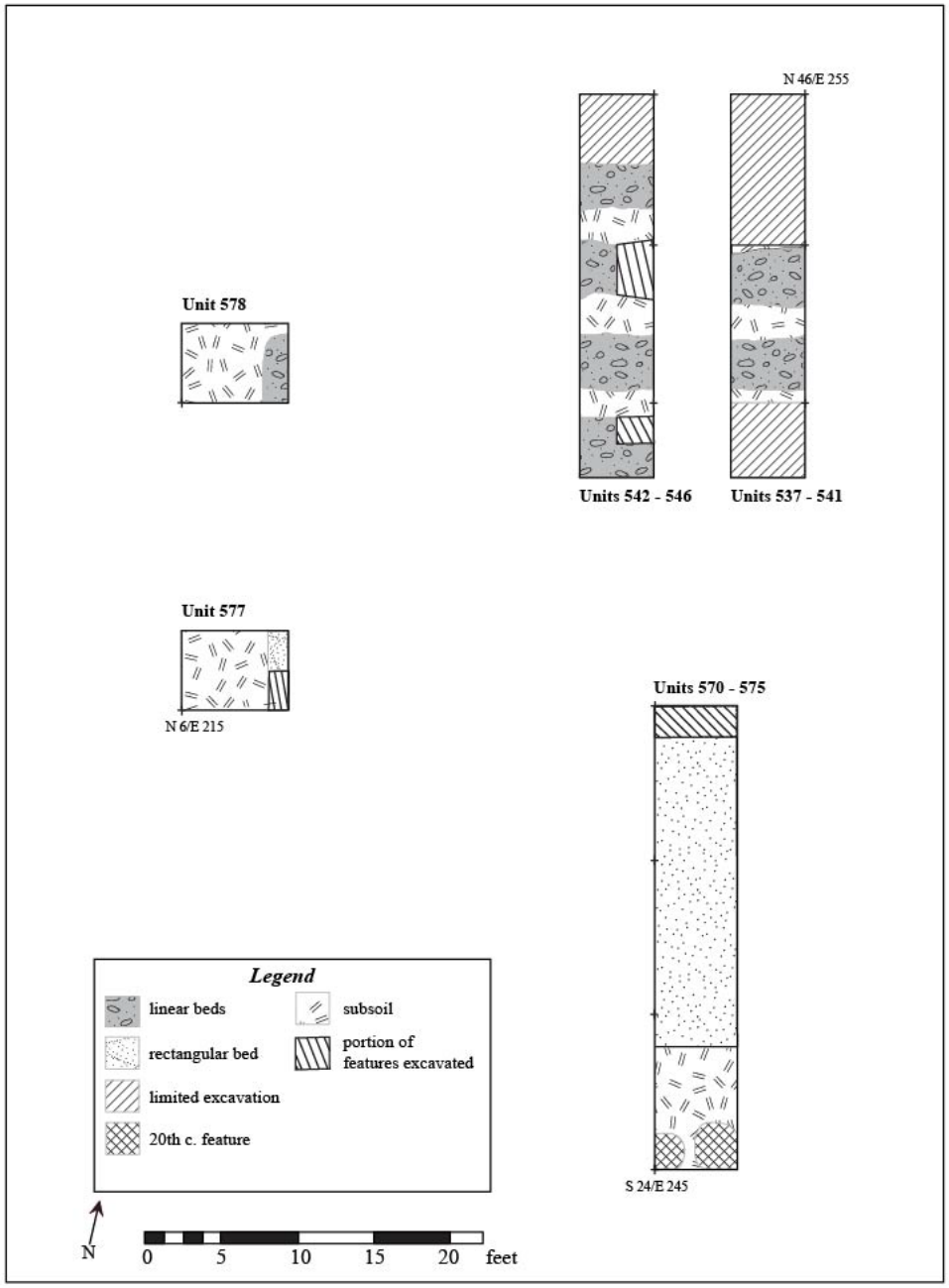


Figure 7. East Garden partial site plan, showing three trenches and two test units revealing portions of five garden beds (prepared by Pecoraro). Portions of the four linear beds were exposed in test units 537-541, 542-546, and 578. The west and south edges of the large garden bed were exposed in test units 570- 575 and 577.

Findings

The character of the soil strata encountered in all 22 test units confirmed that the upper terrace had been stripped and then back filled and leveled. In most cases, when topsoil was removed the underlying soils consisted of mixed clay and loam. These strata yielded a wide range of domestic and structural artifacts dating from the 18th to the early 20th century, and are interpreted as fill layers which were deposited when the area underwent restoration during 1932-34. In two locations (units 570 and 576), however, circular features were revealed below topsoil and intruding the fill layers; these almost certainly relate to planting and then removing two bushes and a tree during a later phase of modifications to the garden (Figures 8 and 21). The recovery of a Lincoln head cent with the date of 1980 from one of the removal holes indicates the relatively recent period when that activity occurred. Subsoil, consisting of a mixture of yellowish brown silty clay and brown sandy loam, was encountered at a depth of between 1-1.4ft below grade in all units except 567-569, where it was not reached until a depth of 2.5ft. At roughly 2.0ft, the 1930s fill layers were correspondingly thicker in those units (Figure 9). The probable cause of the greater thickness of the fill soils found in units 567-569 likely was the presence of a depression in the ground surface in this area, which is depicted as roughly one foot in depth on the 1931 topographic map of the garden.

The make up of the fill layers throughout was similar but not exactly the same. In units 537-538 and 567-569, several such layers were encountered, including small and discrete lenses of relatively dense clay. In the other units the layers were more substantial, usually consisting of just one or two relatively thick and more homogenous strata. The differences in the soils likely have no significance, however, and the artifacts recovered throughout ranged in date over a span of more than 200 years, including two complete medicine bottles dating to the early 20th century. While this finding raises the question as to the original source of the artifacts, it also confirms that the deposits do not retain any analytical or interpretive value.

The four linear garden features were revealed below the lowest fill layer in the western trench (units 542-543-544-545), regularly spaced at roughly 2.5ft and running in an east-west direction (Figures 10-11). The two middle features were also uncovered below fill layers extending into the parallel trench (units 537-538), but the other two features were not exposed there because excavation was halted before reaching that depth in units 539-540-541 (Figures 12-13). What is almost certainly the west edge of the linear feature exposed in units 537 and 543 was revealed extending into the east portion of unit 578 (Figure 14). The two outer features (in units 542 and 546) extended north and south beyond the limits of excavation, with the width of the feature in unit 542 not discernible. Two of the features (designated F2013.01 in unit 544 and F2013.02 in unit 542) were tested. Each revealed a layer of generally dark silty loam mixed with small percentages of sandy clay, overlying a stratum of brick rubble. In F2013.01 (unit 544), the dark loam stratum (A) was relatively thin (less than 0.2ft), and bricks from the underlying layer (B) protruded through the soils and were visible on the surface. In the other feature (F2013.02, unit 542), the brown loam (excavated as two layers, A and B) was considerably thicker at 0.6ft, but overlay a similar lining of brick rubble (Figures 15-20).

Figure 8. Unit 569 looking north, with deep test through fill layers down to subsoil.

Figure 9. Unit 576 looking south, showing profile of excavated tree removal hole down to subsoil; the removal hole is within the earlier planting hole which is visible intruding the 1930s fill layer.

Figure 10. Units 542-546, looking north, during final clean-up of fill soils overlying the four garden features, which in turn cut into the natural clay subsoil.

Figure 11. Removing the last vestiges of overlying fill soils to expose the planting bed feature in unit 545. The exposed brick fragments likely relate to a lining at the bottom of the bed, which protrude through the overlying surviving bedding soils. The brick layer in this feature was recorded by Williams in 1932, and was postulated to indicate a "drainage feature."

Figure 12. Units 537-541facing north, showing the two garden beds revealed below numerous fill layers and intruding subsoil, with the bottom brick strata protruding through the bedding soils. Excavation in Units 539-540-541 was discontinued before the linear features were exposed.

Figure 13. Units 537-538 facing west, showing the garden bed in unit 537 and a portion of the bed in unit 538.

Figure 14. Unit 578 looking north after excavation of fill layer, with the portion of the linear garden bed marking the western limit of the features.

Figure 15. Units 543-546, facing north, after excavation of stratum A in feature F2013.01, to the right of the cross-section line. The dense concentration of brick fragments underlying stratum A did not contain any mortar, indicating that the bricks were not salvaged from another structure, and instead were probably under-fired and/or broken wasters from an episode of brick making and repurposed for this application.

Figure 16. Unit 544, facing east, showing the brick rubble stratum (B) exposed in F2013.01, to the east of the cross-section line. Note the thick layers of fill soils overlying the feature and subsoil.

Figure 17. Unit 544, F2013.01 in plan, after removal of stratum A and with the underlying brick rubble stratum (B) exposed. (Grid north to the right.)

Figure 18. Unit 544, F2013.01 in plan, after removal of stratum B (brick rubble) down to undisturbed clay subsoil. The bottom of the feature was revealed to be relatively flat-bottomed and the sides roughly vertical.

Figure 19. Unit 542 facing south, showing garden bed feature F2013.02, before excavation of stratum A.

Figure 20. Unit 542, detail of F2013.02 in plan, after excavation of stratum A, revealing the brick rubble layer lining the bottom of the trench.

The only artifacts recovered from these features consist of two fragments of dark green bottle glass, a hand wrought nail, and a prehistoric Native American projectile point, all found in F2013.02A. The bottle glass is a fragment of a neck, with an applied, hand tooled lip, of the type likely dating before the second quarter of the 19th century; fully wrought nails also were generally replaced in wide use by that time (Noel Hume 1969). A portion of the rubble layer was excavated in F2013.01, and 12 brick bats, each with two measurable sides (height and width) were recovered. The overall character of the bricks reflects 18th-century production practices: they were made by hand in a sanded mold, exhibiting one smooth face caused by striking the wet clay while in the mold, and five sandy surfaces where it made contact with the bottom and sides. They are variable in color with several bats exhibiting patches of glazing on the surfaces where the brick was overheated during firing. The 12 bats range from 2¼ to 2¾ inches by 4¼ to 4½ inches in dimension, with modal dimensions of 2½ by 4¼ inches. This corresponds with the character and the sizes for bricks commonly used in 18th-century Virginia (Lounsbury 2013:241-243). The lack of mortar found along with the brick fragments supports the interpretation that the bricks were not salvaged from a demolished wall or building. Their size and overall character is similar to the intact bricks found in the Stratford Great House and in the various original dependencies, and thus they may have been "wasters" stemming from those buildings' construction.

A fifth feature was revealed in units 571-575, consisting of brown silty loam mottled with dark grayish brown silty loam, brownish yellow silty clay, and yellow sandy clay, below approximately 0.9ft of fill. The feature occupied all of units 572-575, and extending approximately 2.0ft into unit 571 and forming an edge running in an east-west direction (Figures 21-22). A similar stratum intruding subsoil in the eastern end of unit 577 likely represents the western edge of this feature. Portions of the feature were excavated in units 575 (F2013.60) and 577 (F2013.59), revealing it to be flat-bottomed and comprised of a single soil stratum about 0.5ft thick in unit 575 and roughly 0.7ft in unit 577 (Figures 23-25). A single small fragment of dark green bottle glass and a few small brick fragments were recovered from F2013.60A; in addition to brick fragments, the other artifacts recovered from F2013.59A include: several pieces of burned bone, an oyster shell, a strand of iron wire, an almost complete green wine bottle neck, and a sherd of light green glass, also likely from a bottle. The bottle neck is likely to date to the 18th or early 19th century, but the light green glass appears to be much later in date, possibly 20th century. The outline of the feature conforms relatively precisely with two sides of the bed depicted on Williams's plan, and the combined evidence makes it almost certain that the two features are the same. The relative scarcity of artifacts recovered from all of the portions of the garden beds that were excavated conforms to expectations for this type of feature, as non-organic refuse would have been viewed as non-conducive for growing plants. The single glass fragment recovered that appears to be much later in date seems likely to be intrusive, possibly introduced to the feature via root action. Therefore, while the evidence from the artifacts cannot confirm an 18th-century date for the features, they do not suggest otherwise.

Figure 21. Units 570-575 looking north, after excavation of fill layers, with a planting feature from the 1930s restoration and two removal holes in unit 570 (foreground) relating to later modifications to the garden plan.

Figure 22. Units 570-575 looking south, after excavation of fill layers, with the rectangular garden bed (F2013.60) in the foreground (with intrusive root molds).

Figure 23. Unit 578 looking east, after excavation of fill layers, down to subsoil with a portion of the rectangular garden bed (F2013.59) in the background, extending beyond the pathway and cutting through subsoil. Note the numerous indentations in the subsoil marking the former location of tree roots.

Figure 24. Unit 578 looking east, after excavation of F2013.59A south of the cross-section.

Figure 25. Unit 578 looking north, with excavated portion of F2013.59, down to subsoil south of the cross-section, in the foreground; note the feature's relatively flat bottom and vertical side.

Comparative Evidence

The overall character of the features is similar to a number of others found archaeologically in Virginia that have been interpreted as the remnants of garden planting beds. At the mid-17th-century garden that was excavated at Bacon's Castle, in Surry County (Luccketti 1990), and at George Washington's late-18th-century upper garden at Mount Vernon (White and Breckinridge 2010, Pogue 2012), the evidence indicates that large rectangular beds divided by formal pathways extended across almost the entire footprint of those walled spaces. Numerous period sources depict large "squares" such as these, suggesting that they were common features in ambitious plantation gardens, with the squares often surrounded with flower borders and the interiors given over to fruits and vegetables (Martin 1991:100-133). Linear border beds also were found in conjunction with the large squares at Bacon's Castle, and clusters of smaller linear beds were revealed at Mount Vernon which probably related to the earlier garden or gardens that had been installed during the 1760s-1770s.

Possibly the best contemporary example of a formal plantation garden laid out in linear beds was excavated at Mount Pleasant, in Surry County, Virginia. The garden is oriented to the long axis of the house and forming two substantial terraces extending toward the James River, on the north. Evidence was found for 15 beds situated in the lower terrace, running in an east-west direction, arranged in two rows separated by a space likely marking the location of the main garden path. The beds were long and relatively narrow, ranging from 2.8 to 5.0ft wide (north-south) and from 16.5 to 77.5ft in length (east-west). They were flat-bottomed and averaged 0.55ft in depth, but most were less than 0.30ft and a few had been almost completely destroyed by plowing. The fill of the beds consisted primarily of brown sandy loam mottled with pale brown fine sand. Of particular interest in this context was the discovery of a layer of dry-laid brick rubble in two of the beds, which is quite similar in character to the brick-lined features found at Stratford. Two other beds were found to be lined with wooden rails. The underlying soils at Mount Pleasant are sandy and quite permeable, raising some doubt whether the function of the bricks and rails was to promote drainage, or to serve some other as yet undetermined purpose related to fostering plant growth (Luccketti, n.d.).

Evidence for beds similar to those found at Stratford Hall also has been revealed in relation to several 18th-century town gardens that were located in Williamsburg, and which have been excavated by the Colonial Williamsburg Foundation (Brown and Samford 1990). At the Peyton-Randolph site, archaeologists uncovered four rectangular vertical-sided, flat-bottomed features, arranged in pairs and dug deeply into the subsoil and filled with dark organic soils. Two of the features were found to contain remnants of what likely had been dense layers of broken wine bottles, oyster shells, and animal bones, lining their bottoms.

All of these features match with documentary evidence from the period relating to kitchen garden beds. Preparing deep beds for planting, and especially suitable for vegetables such as asparagus, cauliflower, and artichokes, is recommended and described in detail in English and American gardening manuals that were published from the late

17th to the mid-19th centuries. In these sources, raised beds -- where the plants are grown in a stratum of soil that is elevated above the surrounding ground surface – also were strongly recommended, and period images testify to their widespread use (Brown and Samford 1990). But the special needs of certain vegetables necessitated deeper prepared soils than could be readily accommodated within raised beds. In those instances, the beds were to be excavated to a considerable depth below the ground surface and filled with a mixture of rich organic soil, often including manure. The excavations at Bacon's Castle indicate that a combination of raised and subsurface beds were used there, with the six interior squares seemingly raised and the linear border beds dug deeply into subsoil (Luccketti 1990:29).

Descriptions of the preparations for deep beds are found in two 18th-century sources authored by Williamsburg gentleman gardeners. In his *Treatise on Gardening*, believed to have been written between ca. 1758 and 1764, John Randolph directed that, "the principal thing to be regarded with these plants (asparagus), is the bed in which they are to be placed … Nothing more is necessary than to make your beds perfectly rich and light, that the head may not be obstructed in its growth upwards. Two feet of mould and dung is depth sufficient for any plant." Judge Joseph Prentis, writing in the 1780s, gave similar advice, but with one notable addition: "Set out asparagus as follows. Dig a trench as wide as you intend your Beds to be, and two feet deep, lay a layer of Oyster Shells, six Inches, then lay on six Inches of Horse Dung, and as much Mould, continue so to do, till the Bed is done." (Both quoted in Brown and Samford 1990:109).

Prentis's specification to prepare a six-inch-thick layer of oyster shell at the bottom of the bed is particularly noteworthy, in that no English garden sources have been found that refer to such a procedure. Brown and Samford (1990:109) speculate that the reason for the oyster shell layer may have been to provide drainage, particularly in Virginia's Tidewater region, with its generally dense clay subsoil. "With these beds trenched deeply into the clay to allow room for the growth of the asparagus shoots, drainage may have been doubly important, because one of the advantages of raised beds is that they drain well." In addition to the apparent drainage layers comprised of glass, shell, and bone discovered at the Randolph garden, brick rubble and domestic materials were found at the bottoms of the border beds at Bacon's Castle (Luccketti 1990:36), along with the brick and wood-lined beds at Mount Pleasant (Luccketti n.d.).

Closer to home, numerous entries found in the Journal and Memoranda Book of Richard Henry Lee, spanning the period 1777-1791, provide useful information pertaining to preparing and cultivating his garden at his Chantilly plantation, located just a few miles from Stratford. The layout of the garden, with numerous "beds" of varying sizes that clearly were arranged in an organized pattern, and including a "Great Walk," both follows the pattern found at other plantations, and is suggestive that a similar layout may have been installed at the Stratford Hall East Garden. The entries refer to planting a variety of vegetables during the months of January through February: primarily peas, onions, cabbage, broccoli, radishes, and asparagus. Lee specified where the seed was to be planted, referring both to "beds" (of different sizes) and to a "Square," making it clear that there were a number of these features, and that they formed a substantial garden that

likely was divided by a formal "Great walk." The entry from January 20, 1787, gives the most complete description of the arrangement of the space: "Sowed Early York Cab[bage] in the Short bed next the Great Walk & Scotch Cabbage in Short bed back of that - & Brocoly in the middle long bed & early Batserdy[?] Cabbage in Short bed next to asparagus bed." Interestingly, Lee never refers to flowers or beds devoted to them, but does mention both nut and fruit trees suggesting that they were interspersed throughout the space (Lee 1771-1791).

Considerable evidence indicating the dimensions of 18th-century planting beds is provided by a combination of archaeological and documentary evidence. The four beds at the Peyton Randolph garden ranged in size from 4x20ft, 8x20ft, 8x29ft, and 12x32ft, with depths ranging from 0.5ft to 2.0ft below subsoil. The three beds revealed at Shields Tavern, also in Williamsburg, were 3.5x22.5ft (2) and 5.0x6.5ft, with a depth of 0.3 to 0.5ft, and spaced 2.0ft apart. As mentioned above, the beds at Mount Pleasant ranged between 2.8 to 5.0ft in width and from 16.5 to 77.5ft in length. Descriptions found in the various gardening books of the era call for beds ranging between 2.5 and 5.0ft wide, spaced between 1.5 and 2.5ft apart, and dug to a depth between roughly 2.0 and 3.0ft below grade (Brown and Samford 1990).

At roughly 3.5x45ft (3) and 7x45ft, and set 2.5ft apart, the four linear beds at Stratford Hall conform well to the pattern for the dimensions and layout of such features. Given that the soils overlying the beds have been stripped, it is not possible to determine their depths in relation to the original ground surface. But if the current grade is approximately close to the historic level, then the bottoms of the three tested features would have reached between 2.0 and 2.5ft into the ground. At roughly 35x45ft in dimension, the fifth feature seems more similar to the large squares found in the gardens at Bacon's Castle and at Mount Vernon. At both of those sites evidence in the form of subtle differences in soils were interpreted as the remnants of planting rows laid out within the squares (Luccketti 1990:29, White and Breckenridge 2010), but no evidence of that practice was revealed by examining the Stratford bed.

Soil Analyses

Samples of soil taken from features F2013.01 and F2013.02, two of the four linear garden beds, were analyzed to determine the presence of pollen and/or phytoliths. Both pollen and phytoliths are produced in large quantities through normal life processes of plants, and are relatively durable in archaeological contexts. Pollen data is wind-born, and thus tend to reflect macorenvironmental conditions. On the other hand, phytolith assemblages normally are residues of decay in place, and therefore likely reflect more site specific, microenvironmental conditions. Thus, the pollen record generally indicates the types of plants that existed in the vicinity of the sample, while phytoliths are more likely to indicate the type of plants that were actually rooted within the feature in question. The ability of pollen and phytolith evidence to identify plants and plant populations is highly variable among and between botanical groups, however. Plants that are not silica accumulators do not produce phytoliths, and unfortunately these represent a substantial

portion of the plant kingdom. Pollen is particularly effective in identifying trees, but weak in grasses (Rovner 1990:298-299).

The findings from this study are highly suggestive, although far from definitive given the inherent challenges in using pollen and phytolith evidence to interpret historic gardens. The pollen record is rich in tree remains, including birch, hickory/pecan, walnut, chestnut, beech, oak, and pine. Growing nut trees such as pecan and walnut in gardens is well documented in the period. Other pollen relates to plants in the Sunflower, Pink, Mustard or Cabbage, Bean or Legume, and Rose families (including various types of fruit trees). Cheno-am pollen was found in abundance, and several traditional garden plants – beets, chard, and spinach – are included in that category. In addition, the recovery of *Sporomiella* dung fungal spores from both samples is quite interesting, as adding manure to garden beds is documented as having been a widespread activity. Therefore, evidence was found for a variety of types of plants that are known to have been cultivated in 18th-century gardens, as well as for fungus associated with animal dung. However, it cannot be determined whether any of the pollen relates to plants actually found in the space, as opposed to originating somewhere in the vicinity. The phytolith record is made up primarily of grasses, as is generally the case. Most vegetables do not produce phytoliths, and those which do (squash/melons, beans, maize) were not found (Cummings and Ladwig 2013).

Shovel Test Results

A total of six shovel tests, each roughly 1.0ft in diameter, were excavated in the lower two terraces, in order to document the current soil conditions and to assess their level of integrity. All the tests were located in the northern half of the terraces, with four in the second terrace and two in the third. The soils were excavated in natural layers when they were recognized – although the tight conditions often made that difficult – and extending down to natural subsoil. The soils in each stratum were screened through ¼-inch hardware cloth and any artifacts found were retained.

The four tests in the second terrace (nos. 1, 2, 4, and 5) were arranged in a rectangle, spaced at 20ft east-west and 40ft north-south. The two tests located on the north (nos. 1 and 2) exhibited a virtually identical soil sequence, with topsoil overlying an approximately 0.7ft-thick stratum of brick and mortar rubble, in turn overlying a layer of mixed clay, down to subsoil at approximately 1.9ft below the ground surface. As the Williams plan notes that the soils in this terrace had been stripped, it was a surprise to encounter the thick and compacted layer of brick and mortar rubble, which did not conform to the fill layers found in the upper terrace. The bricks were hand made and the mortar is relatively soft and yellow in color, with inclusions of oyster shell and brick bits, all characteristic of early manufacture. The remaining artifacts all appear to be relatively early – green wine bottle glass, clear flat glass, oyster shell, nails – with a single sherd of buff-bodied, white lead-glazed earthenware that likely dates to the early 19th century.

The other two tests (nos. 4 and 5) encountered subsoil at approximately the same depth (@2.0ft), but the strata in no. 4 consisted of three relatively thick layers comprised of

mixed brown loam and clay, with two similar layers revealed in no. 5. The soils are not obviously consistent with the apparent layers of fill found in the upper terrace, and none of the artifacts recovered are diagnostically later than circa 1820. These include: green wine bottle glass, clear flat glass and clear curved glass, one fragment of blue and white decorated Chinese export porcelain, and nails.

The strata encountered in the two tests in the third terrace (nos. 3 and 6) suggest that both are located in areas that have been disturbed. Test no. 3 consisted of a single stratum of dark yellowish brown silty clay, down to subsoil. This unusual soil sequence suggests that the soils may have been removed and redeposited, but none of the artifacts recovered (clear flat glass, two nails, and one sherd of hard, white-bodied earthenware) are diagnostically 20th century in date. Test no. 6 appears to have intersected with a 20th-century water line.

These results call into question whether the soils in the second terrace were in fact stripped in 1932, as is noted on the Williams site plan. The discovery of the substantial layer comprised of brick and mortar rubble in two tests spaced 40ft apart raises the obvious question as to the source of the material. The results of the other two tests in the second terrace are difficult to interpret, while the two tests in the third terrace appear likely to have been excavated in areas that had been disturbed. The small size of the excavation sample and the variability of the results naturally call into question their interpretive value, and reinforces the assessment that a much more ambitious strategy of testing would be required to properly assess the conditions in the lower terraces.

Figure 26. STP 001, @1.0ft in diameter; a thick (0.7ft) stratum of brick and mortar rubble was revealed below topsoil, and above a layer of mixed clay-loam, with subsoil encountered at 1.92ft below grade.

Conclusion

The excavations carried out in the upper terrace effectively answered the two salient research questions for which the project was developed to address. The strata were found to consist of a number of fill layers overlying subsoil, with artifacts recovered spanning from the 18th to the 20th centuries. This confirms Williams's note that the area had been stripped in 1932, presumably with soils subsequently brought in to raise the grade in conformance to the restoration plan. Portions of five features that match precisely in location and in shape with those depicted on the 1932 excavation plan were exposed. Limited testing of three of the features revealed that they are flat-bottomed and vertical-sided trenches, two of which were lined with a substantial stratum of brick rubble. By comparing the characteristics of these remains with the findings from other excavated 18th-century gardens, it appears probable that the Stratford Hall features are the remnants of garden beds.

No precisely datable artifacts were recovered from the features, but all but one of those items likely dates to the 18th century. The single exception is a fragment of clear glass that probably dates to the 20th century, and thus appears likely to be intrusive. The results of analyzing the feature soils for the presence of pollen and phytoliths are suggestive, but similarly inconclusive in terms of directly associating specific plants with the beds. But the discovery of dung fungal spores in both samples correlates with the probable introduction of manure as a soil amendment.

Given these results, it appears probable that further excavation in the upper terrace would reveal the surviving portions of the beds, but it appears unlikely that other garden features remain to be discovered. Exposing the full extent of the features at hand does not seem to be a high research priority, unless future plans for the site call their preservation into question. As the fifth feature is significantly larger and differently shaped than the other four, this raises the question as to whether it served a somewhat different function as well. At other garden sites, evidence has been found to suggest that large square beds were planted in a pattern of rows that might accommodate a variety of plants. No evidence for that practice was found upon examination of the bed in units 571-575, however.

Confirmation that the five features in the upper terrace are most likely planting beds related to the early garden is provocative, and suggests that at least a portion of the garden was laid out in a pattern that is similar to those found at other contemporary Virginia sites. The absence of evidence for such beds in the southern half of the terrace might be due to at least three factors: no beds ever were located in that area, deep beds had been situated there but were too shallow to survive subsequent gardening or other ground disturbance, or raised beds had been used there instead. It is impossible to make a determination of the reason for their absence based on archaeological evidence alone, but both archaeological and documentary sources clearly indicate that combining deep and raised beds in a single garden was a likely occurrence in the period, and would explain their absence.

The results of excavating six shovel tests in the lower two terraces were considerably less illuminating. The stratum of brick and mortar rubble revealed in two tests in the north half of the second terrace is surprising given the notation by Williams that the soils in this portion of the garden also had been stripped to subsoil. The strata found in the other four tests vary widely and, given the small sample, makes it difficult to interpret the results. This outcome suggests that only a substantial program of research is likely to yield illuminating indications for the level of archaeological preservation in those portions of the garden.

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Appendix A: Soil Descriptions

Unit 537:

Topsoil: 90% dark brown (10YR4/3) silty loam with 10% yellowish brown (10YR5/8) silty clay;
A-Mixed Clay with Brick: thorough mixture of 50% dark yellowish brown (10YR4/6) silty clay, 30% strong brown (7.5YR5/6) silty clay, and 20% brown (10YR4/3) silty loam, with occasional brick bats, frequent brick specks, and occasional carbon specks [1930s fill]
B-Yellowish-Brown Clay: 70% dark yellowish brown (10YR4/6) silty clay, mixed with 25% strong brown (7.5YR5/6) silty clay, and 5% brown (10YR4/3) silty loam, with occasional brick bats and carbon specks, and frequent brick bits[1930s fill]
C-Brown Loam with Brick: 90% dark brown (10YR3/3) silty loam, mottled with 10% reddish yellow (7.5YR6/8) silty clay, with frequent brick bits and specks [1930s fill]
D-Pale Brown: 90% dark yellowish brown (10YR3/4) silty loam, mottled with 10% light yellowish brown (10YR6/4) silt, with moderate brick flecks and occasional carbon specks [1930s fill]

Unit 538:

Topsoil: same as above
A-Mixed Clay with Brick: same as 537A [1930s fill]
B-Yellowish-Brown Clay: same as 537B [1930s fill]
C-Brown Loam: thorough mixture of 45% dark yellowish brown (10YR3/4) silty loam and 45% dark yellowish brown (10YR3/3) silty loam, mottled with 10% brownish yellow (10YR6/8) silty clay, with occasional brick bits and specks, and very occasional carbon specks [1930s fill]
D-Brown Loam with Brick: same as 537C [1930s fill]
E-Pale Brown: same as 537D [1930s fill]

Unit 539:

Topsoil: same as above.
A-Mixed Clay with Brick: same as 537A [1930s fill]
B-Yellowish-Brown Clay: same as 537B [1930s fill]

Unit 540:

Topsoil: same as above.
A-Mixed Clay with Brick: same as 537A [1930s fill]

Unit 541:

Topsoil: same as above.
A-Mixed Clay with Brick: same as 537A [1930s fill]

B-Brown Loam with Brick: same as 537C [1930s fill]

Unit 542:

Topsoil: same as above.
A-Mixed Clay and Loam: same as 537A [1930s fill]
B-Dark Yellowish Brown: 80% dark yellowish brown (10YR3/4) silty loam, mottled with 10% dark brown (10YR3/3) silty loam, and 10% strong brown (7.5YR5/6) clay-loam, with moderate brick specks and occasional brick bats and carbon specks [1930s fill]
F2013.02A: 95% dark yellowish brown (10YR3/4) silty loam, mottled with 5% yellowish brown (10YR5/6) sandy loam, with very occasional brick and carbon specks, and one brick bat [planting bed]
F2013.02B: 95% dark brown (10YR3/3) silty loam, mottled with 5% brownish yellow (10YR6/6) silty clay, with abundant brick bats [planting bed]

Unit 543:

Topsoil: same as above.
A-Mixed Clay with Brick: same as 537A [1930s fill]
B-Dark Yellowish Brown: same as 542B [1930s fill]

Unit 544:

Topsoil: same as above.
A-Mixed Clay with Brick: same as 537A [1930s fill]
B-Dark Yellowish Brown: same as 542B [1930s fill]
F2013.01A: 85% dark yellowish brown (10YR4/4) silty loam, mixed with 5% light yellowish brown (10YR4/6) clay-loam, 5% dark grayish brown (10YR4/2) silty loam, and 5% strong brown (7.5YR5/6) clay-loam, with occasional brick bats and specks, and very occasional carbon specks [planting bed]
F2013.01B: brick bats [planting bed]

Unit 545:

Topsoil: same as above.
A-Mixed Clay with Brick: same as 537A [1930s fill]
B-Dark Yellowish Brown: same as 542B [1930s fill]

Unit 546:

Topsoil: same as above.
A-Mixed Clay with Brick: same as 537A [1930s fill]
B-Clay and Loam: 60% light yellowish brown ((10YR6/6) silty clay, 35% dark yellowish brown (10YR4/4) silty loam, and 5% yellowish brown (10YR5/6) silty loam, with occasional brick specks [1930s fill]

Unit 567:

Topsoil: same as above.
A-Clay Fill: same as 537A [1930s fill]

Unit 568:

Topsoil: same as above.
A-Clay Fill: same as 537A [1930s fill]

Unit 569:

Topsoil: same as above.
A-Clay Fill: same as 537A [1930s fill]

Unit 570:

Topsoil: same as above.
A-Clay Fill: same as 537A [mixed 1930s fill and tree planting backfill]
B-Mixed Brown Loam and Clay: 80% dark yellowish brown (10YR3/4) silty loam, mixed with 10% brownish yellow (10YR6/8) silty clay, 5% yellow (10YR8/8) sandy clay, and 5% dark grayish brown (10YR4/2 silty loam, with very occasional brick bits and carbon flecks [1930s fill]

Unit 571:

Topsoil: same as above.
A-Clay Fill: same as 537A [1930s fill]
B-Linear Intrusion: same as 570B [1930s test trench?]

Unit 572:

Topsoil: same as above.
A-Clay Fill: same as 537A [1930s fill]
B-1Mixed Brown Loam and Clay: same as 570B [1930s fill]
B-2Mixed Brown Loam and Clay: same as 570B [1930s fill]

Unit 573:

Topsoil: same as above.
A-Clay Fill: same as 537A [1930s fill]
B-Mixed Brown Loam and Clay: same as 542B [1930s fill]

Unit 574:

Topsoil: same as above.
A-Clay Fill: same as 537A [1930s fill]

Unit 575:

Topsoil: same as above.
A-Clay Fill: same as 537A [1930s fill]
F2013.60A: 90% brown (10YR4/3) silty loam, mottled with 5% dark grayish brown (10YR4/2) silty loam, 3% brownish yellow (10YR6/8) silty clay, and 2% yellow (10YR8/8) sandy clay, with very occasional brick specks and carbon flecks [planting bed]

Unit 576:

Topsoil: same as above.
A-Removal Hole: 90% red (10R4/6) clay, mottled with 10% brownish yellow (10YR6/8) silty clay [tree removal]
B-Clay Fill I: 70% dark yellowish brown (10YR4/4) silty loam, mixed with 15% brownish yellow (10YR6/8) silty clay, 10% dark yellowish brown (10YR3/4) silty clay, and 5% yellowish brown (10YR5/6) silty clay, with occasional carbon specks and brick bits [1930s fill]
C-Clay Fill II: same as 576B [1930s fill]

Unit 577:

Topsoil: same as above.
A-Mixed Clay and Loam: same as 537A [1930s fill]
F2013.59A: 85% dark brown (10YR3/3) silty loam, mottled with 8% yellowish brown (10YR5/8) silty clay, 5% very dark grayish brown (10YR3/2) silty loam, and 2% yellow (10YR7/8) silty clay, with infrequent brick bits and carbon specks [planting bed]

Unit 578:

Topsoil: same as above.
A-Mixed Clay and Loam: same as 537A [1930s fill]

Appendix B:
Artifacts Recovered from Strata Below 1930s Fill

F2013.01A Unit 544 Planting Bed

1 unid. metal object

F2013.02A Unit 542 Planting Bed

2 green wine bottle glass
1 unid. nail
1 quartz projectile point

F2013.59A Unit 577 Planting Bed

1 green wine bottle neck
1 green tinted vessel glass
2 metal wire
4 burned bone
1 brick fragment
1 oyster shell

F2013.60A Unit 575 Planting Bed

1 green wine bottle neck
1 brick fragment

Acknowledgements

I want to express my gratitude to a number of individuals and colleagues who supported the East Garden excavations. Foremost among them are Paul Reber and the Directors of the Robert E. Lee Memorial Association, who commissioned the project and provided both generous financial and logistical support. Judy Hynson guided me through the Stratford archives during the background research phase of the investigations. Will Rieley of the Garden Club of Virginia collaborated on the research design and reviewed the results and offered many helpful comments. Nick Luccketti kindly shared with me his draft report for the excavations at the Mount Pleasant garden, and Martha B. Katz-Hyman generously shared her transcript of portions of the Richard Henry Lee accounts. Professor Doug Sanford at the University of Mary Washington shared his expertise gained from the more than two decades of archaeological research that he has conducted at Stratford Hall, as well as provided standardized forms and other materials so that the records of this work could be incorporated into the ongoing archaeological research program. Colleagues at the University of Mary Washington and Mount Vernon Archaeology kindly loaned me equipment for survey and for excavation. Kerri Barile of Dovetail CRG, Inc., enthusiastically supported the effort, even volunteering to oversee the excavations for a day when I was unable to be onsite, and supplied a crew of seven very skilled and dedicated professionals for the duration of the field work: Johnie Sanders, Kevin McCloskey, Morgan MacKenzie, Jon Lewis, Ally Crowder, Adriana Lesiuk, and Katie O'Brien. Luke Pecoraro prepared the site maps contained in the report. Tommy Moles and Matt Peterschmidt assisted our efforts in a variety of ways, and cheerfully accepted the fact that our work would necessarily inflict considerable (if temporary) damage to their meticulously maintained landscape.