

**ARCHAEOLOGICAL INVESTIGATIONS AT  
GUNSTON HALL PLANTATION  
(44FX113)**

**Report on 2012 Activities**

**David B. Shonyo**

**Staff Archaeologist**



**GUNSTON HALL PLANTATION  
Archaeology Department  
Mason Neck, Virginia**

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## Table of Contents

|  |    |
|--|----|
| Acknowledgements   | 3  |
| Introduction   | 5  |
| Carriage Turnaround Area   | 8  |
| Schoolhouse Area   | 14 |
| Kitchen Yard Walkway   | 18 |
| Garden and Kitchen Yard Fence  | 25 |
| Road Bed Deposits  | 29 |
| Summary and Conclusions  | 33 |
| Work Plan for 2013   | 36 |
| Newtown  | 36 |
| Slave Occupation   | 37 |
| Road Bed Deposits  | 39 |
| References   | 40 |
| Appendix: Identification of Potential Locations for<br>Slave Quarters at a Virginia Plantation Using<br>Phosphate and Potassium Levels (by Sam Pell) | 43 |
| Background   | 46 |
| Procedure  | 48 |
| Results  | 49 |
| Conclusions  | 50 |

## Acknowledgements

The archaeology program at Gunston Hall is a project of the Gunston Hall Board of Regents, and funding to support labor costs is provided by that organization. However, the program is dependent on gifts and grants to cover the cost of supplies, equipment and other expenses. I am enormously grateful, therefore, to the support provided in this respect during 2012 by individual members of the Board of Regents and other persons and organizations.

The continued support, interest and encouragement given by members of the Board of Regents have been most gratifying. Particularly appreciated has been the personal attention bestowed by First Regent Wylie Raab, Regents Archaeology Committee Chair Mary Ingham, Regents Historic Grounds and Gardens Committee Chair Margery Jenkins and all of the individual members of the aforementioned committees.

The program is indeed fortunate in that it is assisted by a corps of accomplished volunteers. Those providing assistance during 2012 were: M.J. Basilone, Carol Boland, Alex Bowers, Janice Brose, Hanna Bunting, Maria Calderon, Jerry Foster, Lindsay Hamblin, Susan Hardenburgh, Coleen Hill, Lucy Holden, Molly Hulsey, Susan Marquis, Mike Massie, Grace May, Annette Neubert, Ann Oliver, Meghan Pelaz, Anatoly Policastro, Merry Beth Policastro, Leslie Rakowsky, Sarah Romero, Karl van Newkirk, Donald Ward and Claudia Wendling .

In addition to assisting with the archaeological field and laboratory work, several volunteers undertook a variety of document research projects. These have proved invaluable not to the archaeology program, but to our understanding of the Mason family and to Gunston Hall in general. The persons involved in these projects were Carol Boland, Jerry Foster, Paul Inashima, and Claudia Wendling.

During the 2012 season, we were fortunate to again have Paul Inashima serve as field consultant to the program. Among other projects, Paul is conducting a survey which

will result in the creation of a three-dimensional, interactive map of the site. The map will designate all areas excavated since 1949, when the property was acquired by the Commonwealth of Virginia. An added feature will be the ability to “reconstruct” structures and other landscape features as they may have appeared in the eighteenth century.

# Introduction

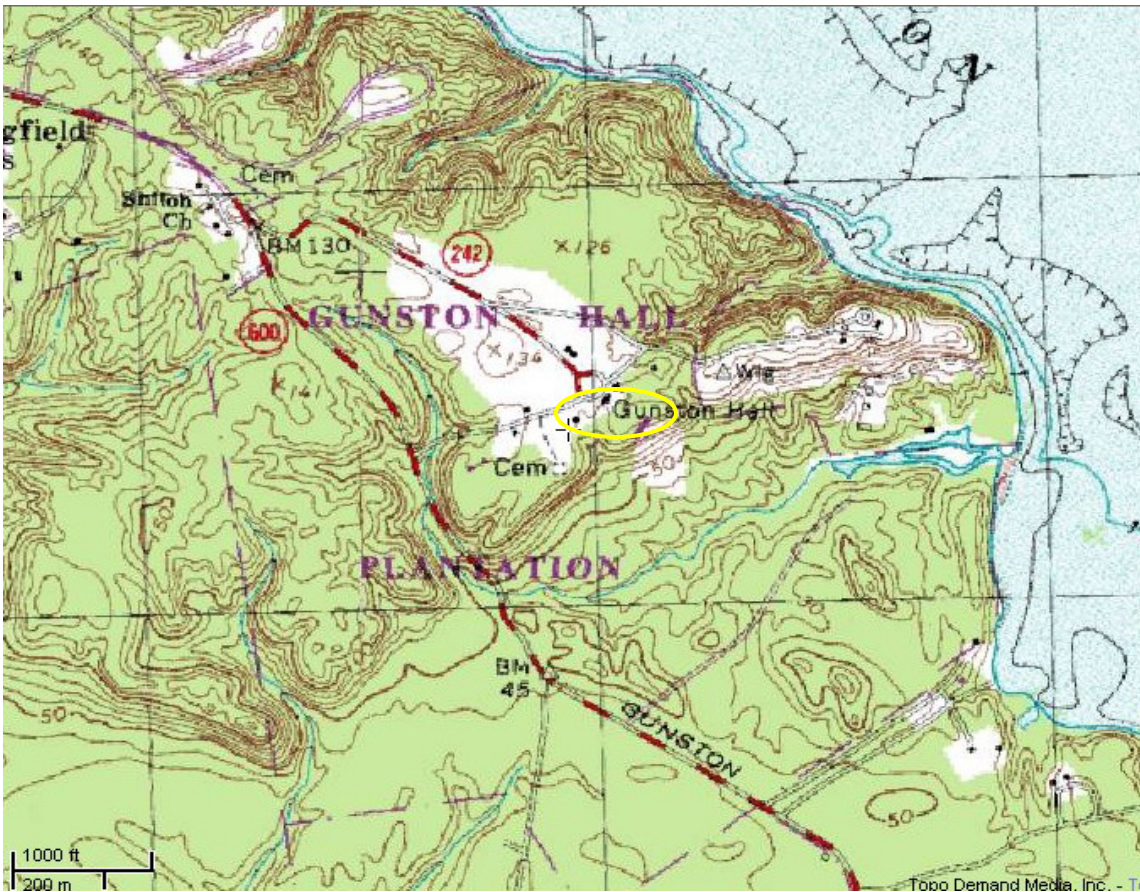
The objective of the archaeological research program at Gunston Hall is to gain an understanding of the landscape as it existed in the eighteenth century so that George Mason's exterior living space can be more accurately interpreted. This must be done in the absence of any contemporary documentation. Nothing is known to have survived that might describe the eighteenth century Gunston Hall landscape or its contents.\*

Archaeology at Gunston Hall must therefore be done in a kind of "patchwork" fashion. The unearthing of a particular feature will often suggest where to look next. Or, a new finding might suddenly make sense of a feature found, perhaps, years previously. The projects undertaken during 2012 exemplify the kind of archaeology done to follow-up on previous findings. These projects were:

- Resolution of the size and configuration of a gravel feature first tentatively identified as a carriage turn-around area in 2011;
- Investigation of an anomaly recorded during a geophysical survey undertaken in the late 1990's;
- An attempt to verify the location, suggested by previously obtained evidence, of a fence or hedge line that defined the west boundary of the formally maintained area around the mansion;
- Determined the end point of an eighteenth century gravel walkway which had been previously exposed in the kitchen yard;
- Based on the evidence of previously-found post holes and molds, established the location of an eighteenth century fence bounding the kitchen yard and its connection to the fence on the east margin of the formal garden;
- Re-opened an area, first identified in 2002, containing a large eighteenth century "trash" deposit located in a sunken road bed.

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\* This must be qualified to a certain extent by the existence of John Mason's *Recollections* (Dunn 2012). This document was intended to recount John's boyhood life with his famous Father, George Mason. It was written in the 1830's and does mention, in passing, some landscape features. However, it does not give useful descriptions or exact locations of the features.



**Figure 1.** Environs of the 2012 study area. The excavations were conducted within the area of the yellow oval. (Detail from USGS Belvoir Quadrant)

The study areas were within 300 feet of the mansion. The mansion is near the east end of a ridge that runs in a more-or-less east-west direction across the Mason Neck peninsula (Fig 1.). The landscape is generally flat and open, with a scattering of trees and buildings. The soil in the area excavated was of the relatively well-drained Grist Mill sandy loam series (Fig. 2).

The general study methodology followed that described in Shonyo 2008:5.



**Figure 2.** The soil series in the areas investigated during 2012 are designated Grist Mill sandy loam (indicated as 40 in the map), Matapeake silt loam (76B) and Sassafras-Marumsco complex with 25% to 45% slopes (91E). Excavation work was done in the areas indicated in red. Soil phosphorus testing done in 2011, and reported in the Appendix of the present report, was within area designated by red dashed lines. The red arrow designates the presumed southwest margin of the eighteenth century curtilage (see page ). The surrounding soil series are: Beltsville silt loam (7B); Sassafras-Marumsco complex with 7% to 15% slopes (91C and Urban (95). (Detail from California Soil Resource Laboratory 2010)

## Carriage Turnaround Area

Excavations relating to a possible carriage circle at Gunston Hall have been conducted, sporadically, over a number of years (e.g., Shonyo 2008:9-12; Shonyo 2011:31-35; Shonyo 2012:18-22). It is known that a rather asymmetrical carriage circle was present on the land front side\* of the mansion when Louis Hertle purchased the plantation in 1912 (Fig. 3). Hertle later had this feature modified to be bilaterally symmetrical (Fig. 4). The carriage circle was removed in 1976.

Archeological investigation revealed that the oldest part of this feature dated to the late nineteenth century or very early twentieth century. The road material lay upon a stratum of fine sandy loam which was rather uniform in its composition and which contained a mix of eighteenth and nineteenth century artifacts throughout its depth. The stratum averaged about 0.80 foot in depth and rested on clayey subsoil (Shonyo 2008:9-12). It had the appearance of being either a plow zone or, perhaps, fill soil. Apparently, if a carriage circle existed in the eighteenth century, it was obliterated by the episode that created this stratum.

Although carriage circles were common features of Colonial Virginia plantations, they were by no means universal. For example, Shirley Plantation has a landscape which remains largely unaltered from the original. Apparently it did not possess a carriage circle (Shirley Plantation 2012). If Gunston Hall did have a carriage circle, it seems to have disappeared by the 1870's. A Mr. Haislip, who was familiar with Gunston Hall as a child and was interviewed in 1952 by the then Superintendent of Gunston Hall, stated that "...he did not remember any circle, but did remember a pathway straight to the Mansion". (R.L. Montague to Mrs. John L. Sullivan, letter, 5 February 1952, Archives, Gunston Hall Plantation, Lorton, Virginia.)

The episode that resulted in the sandy loam stratum mentioned above did not impinge on the area on the mansion side of the road that runs parallel to the front of the mansion. Excavations in this area during 2010 and 2011 yielded several gravel

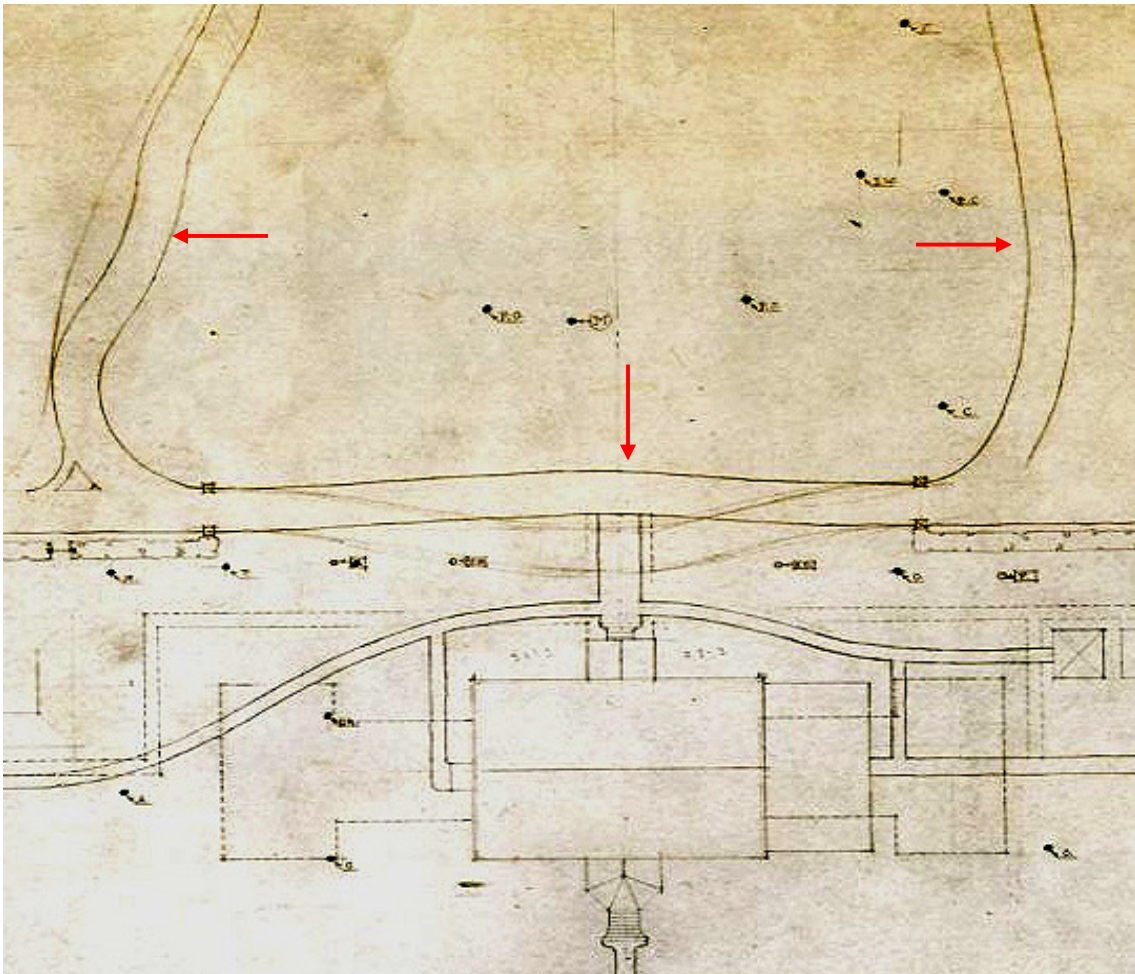
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\* That is, the northwest-facing side.



features, including evidence that in the eighteenth century the road running parallel to the front of the mansion was closer to the mansion than at present (Shonyo 2011:31-35; Shonyo 2012:18-22).

As the 2011 field season drew to a close, however, no suggestion of a carriage circle was to be had. It was decided to use a soil probe in the area of the front of the mansion. Near the front of the mansion, to the right of the entrance, an area of distinct and seemingly gravelly resistance was encountered. An excavation unit, the final one of the season was opened here. The resistance turned out to be due to a deposit of coal



**Figure 3.** A portion of the carriage “circle” as it existed in 1913 (red arrows) is shown in this architects’ drawing. (Gunston Hall archives)

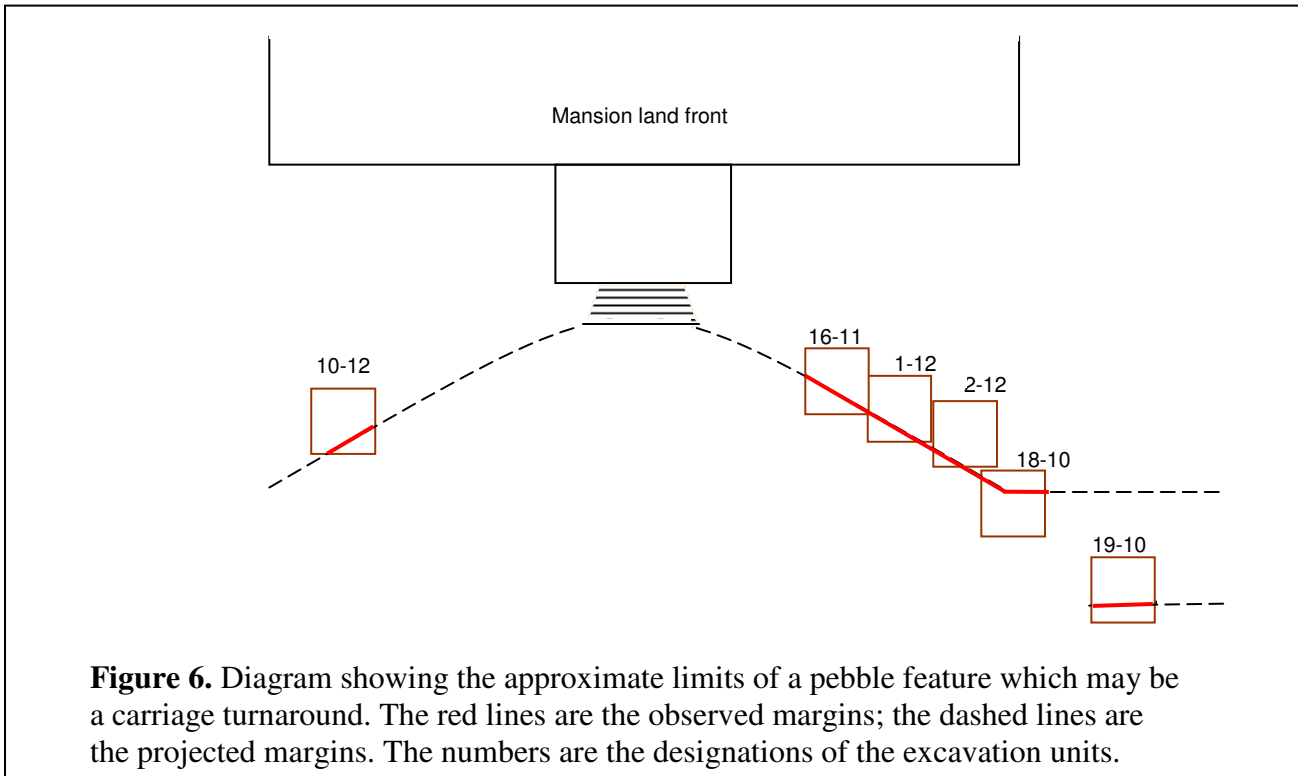


**Figure 4.** The axially symmetrical carriage circle at Gunston Hall as it appeared c.1920. (Gunston Hall archives)

fragments. It appears that sometime during the nineteenth or early twentieth centuries deliveries of coal were dumped here prior to being shoveled through a basement window.

Below the coal deposit, at 0.95 foot below the unit datum corner, the surface of a pebble feature was revealed which exhibited characteristics of interest with regard to the carriage circle search (Fig. 5). The feature had a curved edge which, if extended eastward, would pass along the front edge of the steps leading to the mansion entrance portico. All of the artifacts associated with the feature were items that could have been present during George Mason's time at Gunston Hall.

During the 2012 field season, three additional units were excavated to get a better idea of the size and configuration of the feature. Units EU 1-12 and EU 2-12 were excavated in front of the mansion, to the west of the entrance. These were placed over the presumed margin of the feature. Although the margin was disrupted in several places by planting holes and other disturbances, it does seem to form an arc (Fig. 6). The third unit, EU 10-12, was excavated a short distance from the front of the mansion to the east of the entrance. A pebble feature was uncovered at 0.90 foot below the unit datum corner having a curved margin similar to that seen in the units to the west.



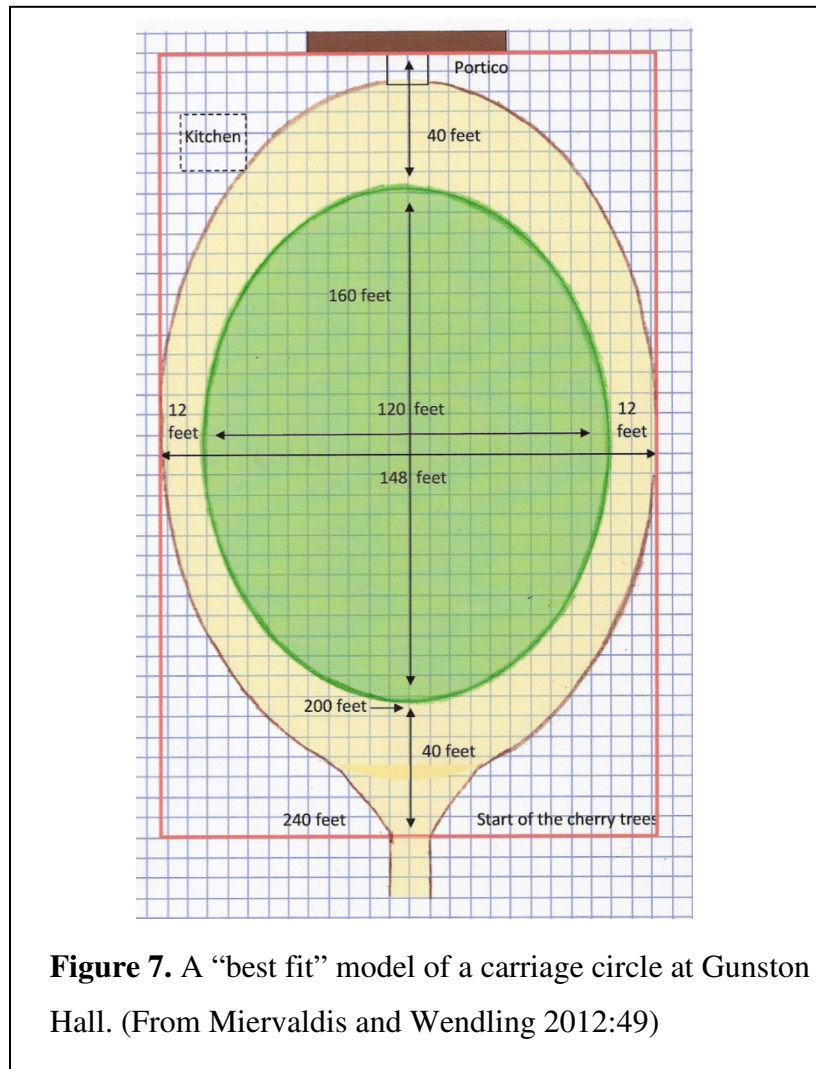
The question now is whether the pebble feature is part of a carriage circle or a gravel apron similar to, but larger than, the apron that currently exists just outside the land front mansion entrance. This will probably remain an open question barring the emergence of a document that will resolve the problem.

The main argument for a carriage circle is that most eighteenth century plantations had them. Also, the pebble feature is not inconsistent with the near-house end of a carriage circle.

On the other hand, as was pointed out above, a few eighteenth century plantation houses did not have carriage circles and there was not one at Gunston Hall by the 1870's. Possibly, Mason felt that a carriage circle would have not been compatible with the optical effects created by the "gooses foot" arrangement of cherry-tree avenues along his entrance road (Shonyo 2009:8-14). In fact, a circle would not be needed. After depositing their passengers at the mansion entrance, horses and their equipages could turn right to the road that ran past the stables. Or, if it was desired to

leave the plantation, they could turn left to proceed on a road that ran parallel to the entrance road and eventually joined it.

If it should become desirable to construct a carriage circle at Gunston Hall, and if no additional information comes to light, it is highly recommended that Wendy Miervaldis' model be used as the basis for the design (Miervaldis and Wendling 2011, 2012). Miervaldis and Claudia Wendling have done extensive research on the carriage circles of homes may have influenced George Mason, with particular attention to the mathematical relationships involved. The morphological comparisons and computational analyses led to the "best fit" model shown in Fig.7.



Although it has nothing to do with carriage turnarounds, it may be worth remarking on the relatively high abundance of artifacts in the lower strata of the excavation units near the mansion entrance (EU's 16-11, 1-12, 2-12, 10-12). The areas around the entrances are often rich in artifacts. However, it comes as something of a surprise to find this is also the situation around the formal, principal entrance to a plantation mansion. Even more surprising is that, judging by the number bone fragments, garbage as well as trash was being deposited here. Most of this material was recovered in strata that were at the same elevation as or below the pebble feature. For example, the artifacts from the stratum EU 16-11 that was at the same elevation as, and adjacent to, the pebble feature were: 42 ceramic shards ( 1 lead-glazed redware, 1 porcelain, 33 pearlware, 7 creamware); 23 glass shards; 16 nails; 3 teeth; 24 mammalian bone fragments.

## Schoolhouse Area

Because of a special ceremony that was scheduled to take place on the land front side of the mansion, we were requested to temporarily halt our excavations there. This offered an opportunity to investigate the area immediately to the west of the schoolhouse building (Fig. 2). Here, we focused on two questions of fairly long standing: the nature of a fairly massive subsurface anomaly revealed during a magnetometer survey, and the location of the fence or hedge line that formed the west boundary of the enclosed area around the mansion.

### **Magnetometer anomaly.**

In 1998, Bevin (1998) performed a geophysical survey of parts of what had been George Mason's formal garden and the area around the site of Mason's schoolhouse. Data from the total field magnetometer indicated the presence of two masses near the west side of the present schoolhouse structure. One of these was designated as having a mass equivalent to 300 pounds of steel and the other a mass equivalent to 150 pounds of steel (Bevin 1998:13, Figure 9). Bevin speculated that the larger of these may have been at the site of a privy associated with the schoolhouse. A shovel test pit (STP) survey, conducted in conjunction with a 1999 field school, revealed a significant increase in the density of recovered artifacts in the vicinity of the masses.

John Mason, in his *Recollections*, mentions a schoolhouse standing to the west of the mansion (Dunn 2012:59). The structure appears to have survived well into the nineteenth century, as it is picture in a drawing thought to have been made in the early 1870's. Later in the 1870's, the structure was replaced by a cottage built by the then owner of Gunston Hall, Col. Edward Daniels, for his mother-in-law. The cottage became the office for Gunston Hall from 1949 until it was removed to another part of the plantation grounds in 1956. In 1956, excavating in the area formerly occupied by the cottage, James Knight found what he identified as the foundation of the schoolhouse (Fauber 1986: 7). Finally, in 1962, the present schoolhouse structure, based on the above-mentioned drawing, was constructed at the location of the foundation found by Knight.

In an effort to determine the nature of the larger of the two masses, two adjacent 5' x 5' units (EU's 3-12 and 5-12) were excavated parallel to the west side of the schoolhouse structure and about two feet from it. The units were dug to slightly more than one foot below the datum corners, where clayey subsoil was encountered. The soils in both units were quite disturbed, both by an overall mixing and intrusions of various kinds.

As suggested by the earlier STP survey, the units contained an abundance of artifacts. Little or no seriation was apparent\*. The diagnostic artifacts are mainly nineteenth century types, with some late eighteenth types (such as pearlware) included. The mix included bone fragments and mollusk shells, indicating that food remains were among the items deposited here. Overall, the artifacts would seem to be associated with the cottage that once stood in this area, rather than the school house. Nothing was found in the units which could obviously account for the magnetic anomaly detected by Bevin.

### **Curtilage boundary.**

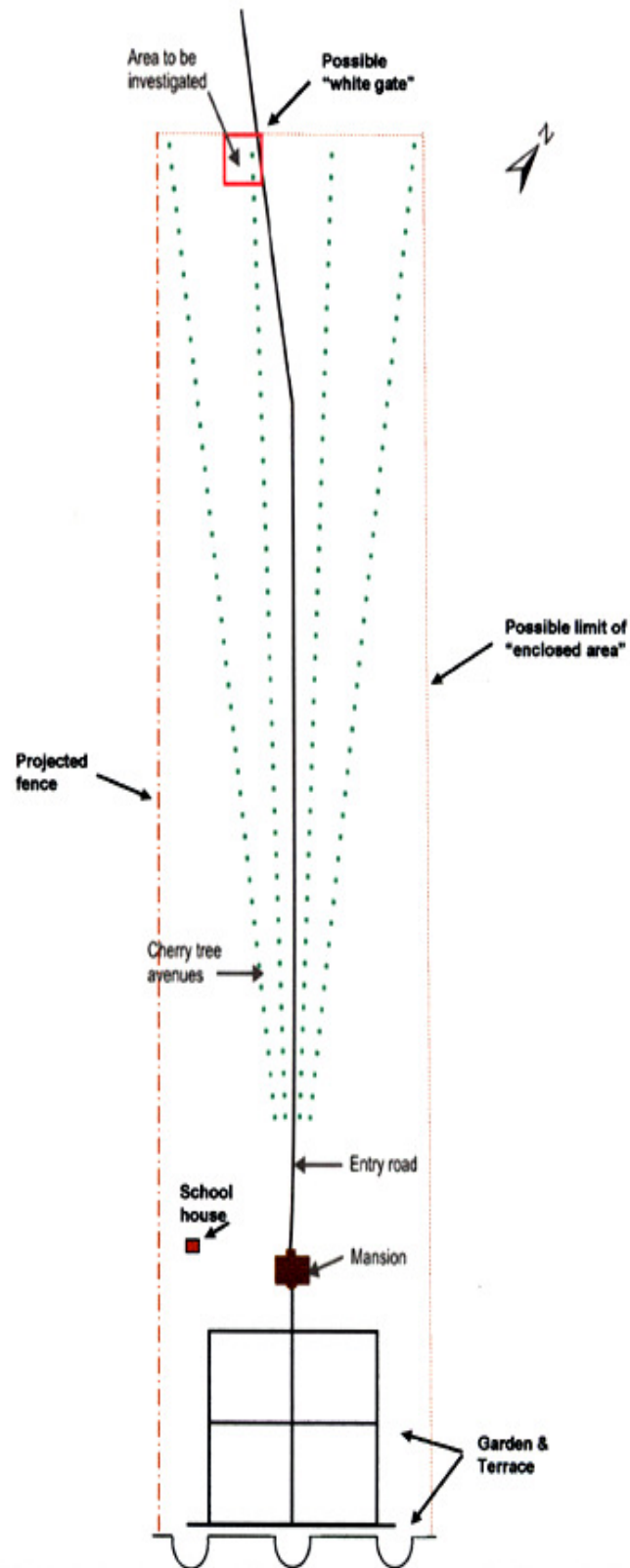
John Mason speaks of an "enclosed ground" which surrounds the mansion (Dunn 2012:59). Several lines of evidence suggest that the margins of this enclosed ground, or curtilage, were as indicated in Fig. 8 (Shonyo 2011:36-39). The suggested west margin can also be seen in Figure 2. However, John Mason does not tell us what was used to enclose the ground, although either a fence or hedge would seem a reasonable guess.

It was determined that the curtilage boundary would most likely be found along the W200 transect of the coordinate system used in the Gunston Hall historic core†. Previous eighteenth century fence lines excavated at Gunston Hall have had the post remains spaced at ten-foot intervals. The plan was to excavate a 5' x 5' unit which

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\* The artifacts from these units had not been fully processed at the time of this writing.

† The coordinate system in the historic core is aligned with the side of the mansion, rather than the cardinal directions, which puts it in alignment with eighteenth century landscape elements. The N-S "0" transect runs along the east wall of the mansion, so W200 is 200 feet west of that wall.



**Figure 8.** Diagram showing the projected margins of the curtilage, or “enclosed ground,” at Gunston Hall. Excavations during the 2012 field season straddled the red dashed line near the school house



straddled the W200 transect. If no evidence of post or shrub remains was found, a second, adjacent, 5' x 5' was to be excavated, thus allowing a full ten foot length of the W200 transect to be examined.

A unit, EU 4-12, was excavated with a southwest (datum) corner at N50W202. The upper 0.60 foot appeared spoil and debris from construction or demolition activities. This was underlain by a very compact mix of clay with other soils. The clayey subsoil, encountered slightly over a foot below the datum corner, revealed a roughly circular soil feature centered at N51W198. The presence of carbonized root traces indicates that this may have been a planting hole.

In view of the highly disturbed soil in this immediate area, it was decided not to pursue the original plan to excavate a unit adjacent to EU 4-12. The next unit, EU 6-12, was placed 45 feet south along the W200 transect with its southwest corner at N5W202. Soil coring indicated that the disturbances found in the previous unit were not present in this area. However, the entire southeast corner of the unit was occupied by what appeared to be a rectilinear excavation filled with a loamy, artifact-rich soil. There were no features indicating post or hedge remains.

The areas around the mansion became available for investigation once again, so further investigation of a possible curtilage boundary was temporarily abandoned. This is such an important element of the eighteenth century landscape that it is well worth revisiting. It would be very premature to call the soil feature found in EU 4-12 evidence of a hedge line. However, it's very close proximity to the W200 transect certainly encourages one to determine whether there are similar features elsewhere along the transect.

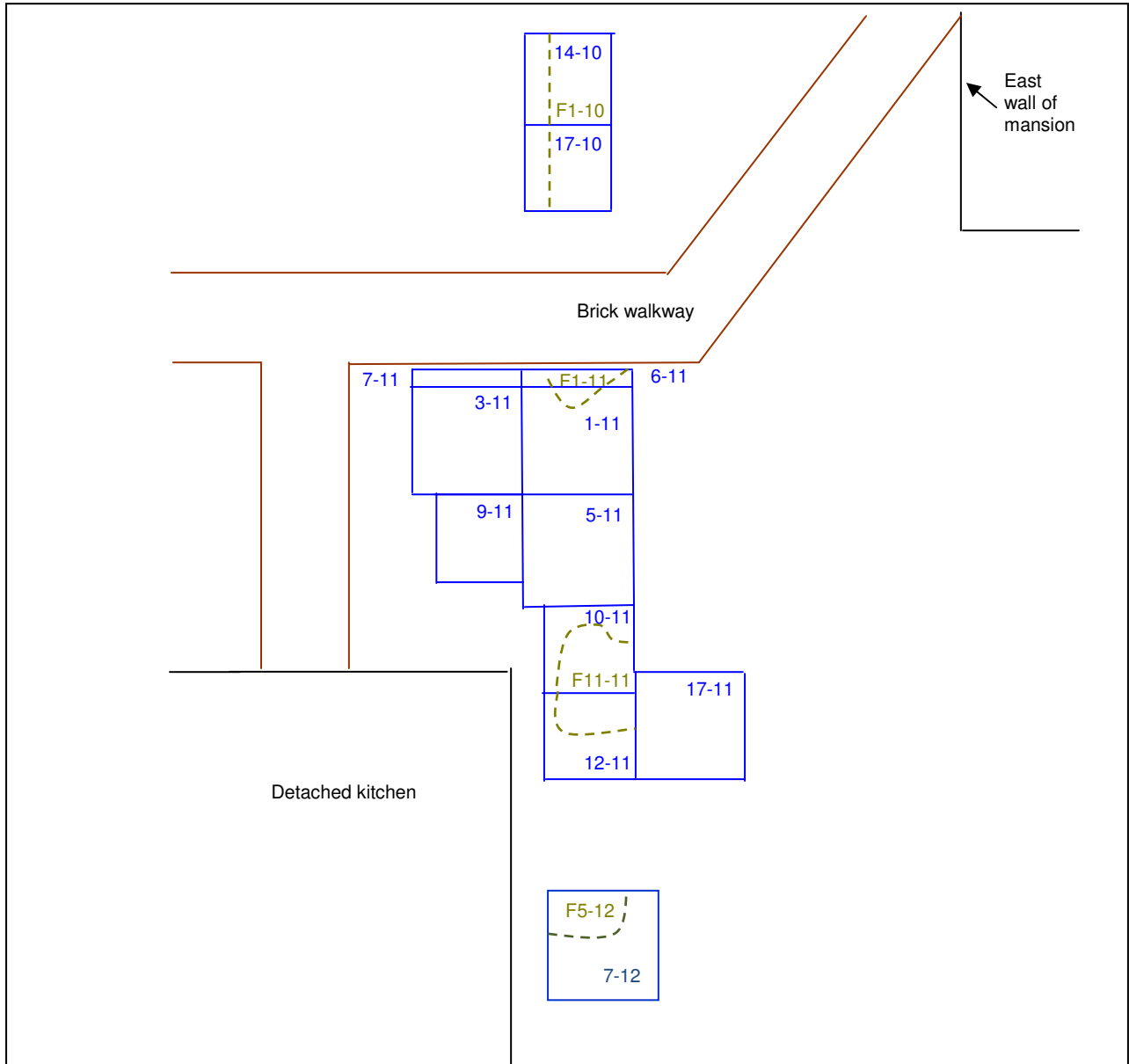
## Kitchen Yard Walkway

One of the projects undertaken during the 2010 field season was some mitigation work in advance of a construction project proposed for the kitchen yard (Shonyo 2011:23-30). One of the features uncovered was a pebble walkway which could be clearly dated to the eighteenth century (Figure 9, feature F1-10 in units 14-10 and 17-10). Very little is known about the configuration of the kitchen yard during Mason's time. Therefore, the walkway was considered to be of particular importance for its potential to help illuminate this subject.

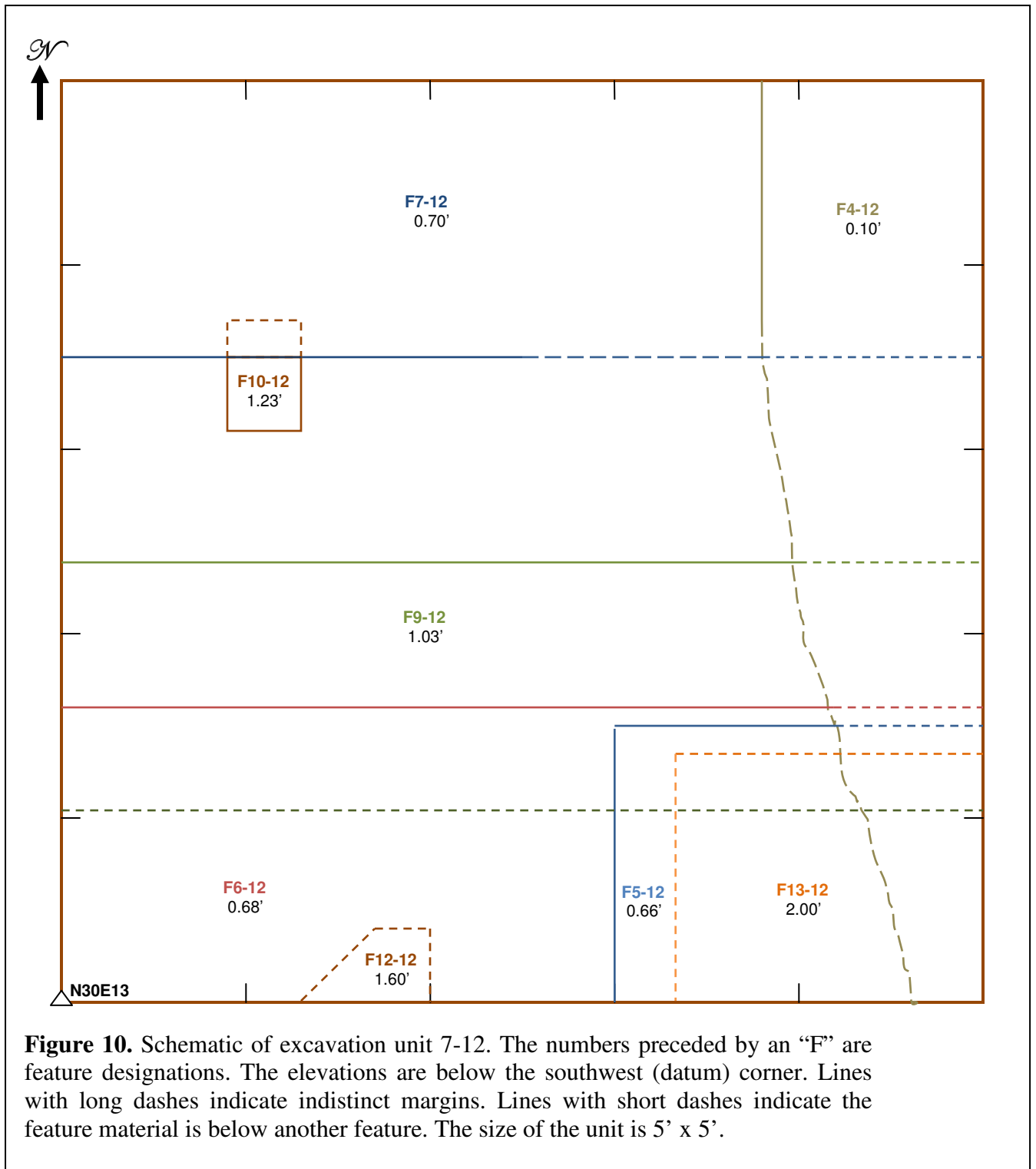
The area of the 2010 excavations had been covered by a nineteenth century wood frame addition to the mansion until it was demolished in the early 1950's. This helped protect part of the walkway, to the feature was fully intact in the section excavated. However, a cellar underlay part of the frame addition, and this completely obliterated the segment of the walkway that would have lain just above unit 14-10 in the diagram. (Note that the diagram is inverted, with south at the top and north at the bottom.)

It was decided to attempt to trace the course of the walkway to determine what it could reveal about the eighteenth century kitchen yard. This project was begun during the 2011 field season (Shonyo 2012:9-17). It should be mentioned that the structure labeled "Detached kitchen" in Fig. 9 is a conjectural representation of structure that may have stood here in Mason's time. It was built in 1976 over a foundation trench that was excavated by Kelso (1973) and Outlaw (1973) and interpreted as the remains of a kitchen by those investigators.

The units excavated are represented in Fig.9. Only two patches of the walkway (F1-11 and F11-11) remained in this heavily disturbed area. It was thought that the walk might turn toward the kitchen entrance (which is located in the current structure in the place suggested by the 1973 excavations). However, no evidence for this could be found. Instead, the walkway seemed to run parallel to the west wall of the kitchen structure.



**Figure 9.** Diagram of units excavated as part of an investigation of an eighteenth century walkway in the kitchen yard. F1-10, F1-11, F11-11 and F5-12 are segments of the walkway. The other numbers are excavation unit designations.



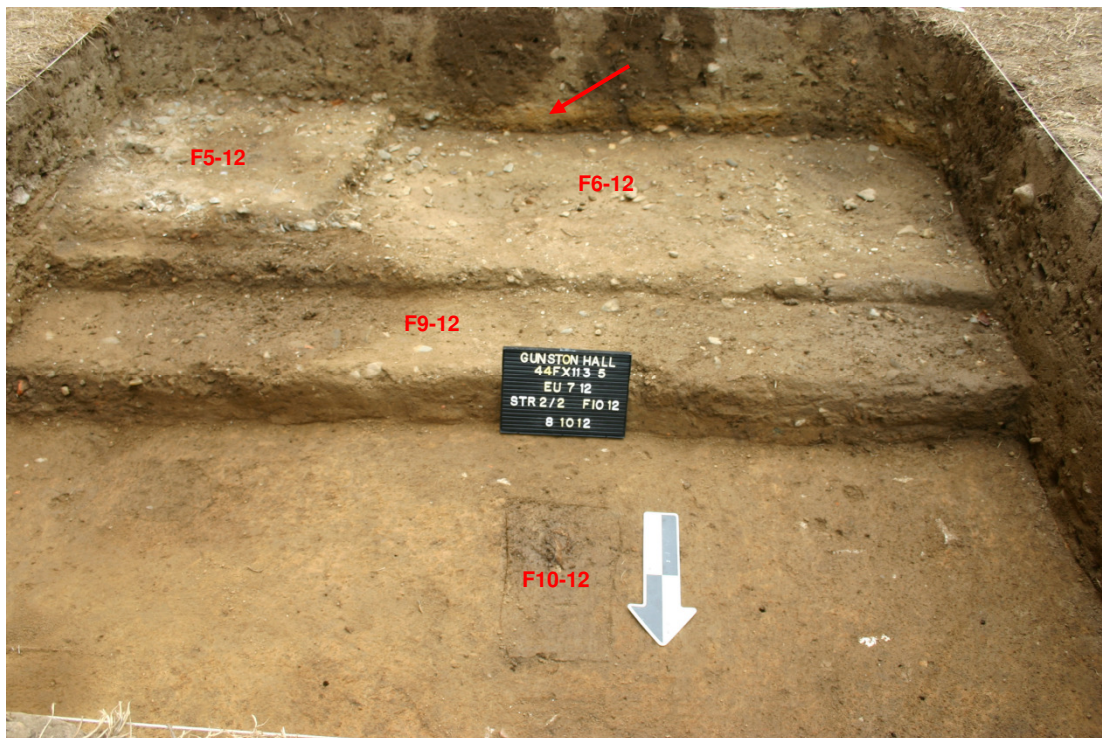
**Figure 10.** Schematic of excavation unit 7-12. The numbers preceded by an “F” are feature designations. The elevations are below the southwest (datum) corner. Lines with long dashes indicate indistinct margins. Lines with short dashes indicate the feature material is below another feature. The size of the unit is 5’ x 5’.

The use of a soil probe indicated that yet another segment of the walkway feature might lie just opposite the mid-point of the west wall of the detached kitchen. During the 2012 field season, a 5’ x 5’ unit was opened to investigate this possibility (EU

7-12, southwest corner at N70E13). It was also of interest to determine whether there had been a fence running along one side or the other of the walk.

The unit proved to be quite complex (Figures 10, 11). It contained five distinct pebble features and three soil features. The features can be described as follows:

*Feature F4-12.* This was comprised of a 0.4 foot thickness of crushed diabase (bluestone gravel) in a fine sandy loam matrix. It trended in a north-south direction and extended into the east wall of the unit. The feature appeared to be intact in the northeast corner of the unit, but was a scatter of gravel along the remainder of its length in the unit. A layer of crushed oyster shell was in contact with the gravel in the intact portion, but is separated from it in the disturbed portion. Crushed diabase was not used in this area until about 1930, when quarries of the material were opened in northwest Fairfax County.



**Figure 11.** Unit 7-12 in the process of being excavated, showing some its features. Feature F5-12 has been partially removed. The upper, sand, component of F6-12 (arrow) has also been removed.

*Feature F5-12.* This feature is quite likely part of the eighteenth century walkway that was partially investigated during the two previous field seasons. Its depth below the surface, physical characteristics and artifact content are all similar to other observed segments of the walkway. The exposed portion was located entirely within the southeast quadrant of the unit, and was composed of rounded pebbles in a sandy loam matrix. The exposed north and west sides appear to terminate cleanly; i.e., they do not seem to have been truncated by disturbances to the ground. It sits directly on top of Feature F6-12.

*Feature F6-12.* The upper layer of this two-component feature was composed of sand. (This can be seen in the sidewall in fig. 11.) The sand layer abutted the west margin of Feature F5-12. The composition of the second, lower, component is very similar in appearance to that of F5-12. This component was in direct contact with the bottom surface of the latter feature. The north margin is well defined and forms a nearly straight line.

*Feature F7-12.* Only the portion of this feature in the northwest corner of the unit was intact. The remainder was reduced to a pebble scatter by a soil disturbance. The feature material was rounded pebbles in a sandy loam matrix. The south margin is straight and well formed. The north margin would be under the unexcavated area to the north. It may part of the road running parallel to the north side of the mansion, which was previously seen to the west (e.g., in units 18-11 and 19-11, Fig. 6). If that is the case, then the feature may represent a portion of that road that was extended across this area after the detached kitchen had been removed.

*Feature F9-12.* This feature seems to protrude from below F6-12. It is, in fact, in contact with the bottom of F6-12 for about 0.50 foot. There was a scatter of pebbles from that point to the south sidewall of the unit. Again, the feature was composed of rounded pebbles in a sandy loam matrix. Its straight north margin was well defined.

*Feature F10-12.* Lying partially under Feature F7-12, this soil feature was rectangular in shape. The fill was a brown silty loam. It may well have been a post mold. The

surrounding post hole was very difficult to discern. A good vertical profile could not be had because of disturbances by tree roots. In any case, the configuration is not consistent with eighteenth century post remains seen to the garden and kitchen yard areas.

*Feature F12-12.* Another possible post mold, this angular soil feature lay completely below F6-12 and the scatter from F9-12. The fill was a brown silty loam, and it extended into the south sidewall of the unit. The profile revealed perfectly parallel sides, as one would expect from a post mold. However, a surrounding post hole could not be discerned.

*Feature F13-12.* Occupying the southeast corner of the unit, this soil feature was below both F5-12 and F6-12. It has well defined straight north and west margins. The south and west margins extend into the unit sidewalls. Its depth was not determined. The feature fill was a yellowish brown silty loam, which contrasted with the surrounding native fine sandy loam. Inclusions included crushed shell, charcoal, and brick fragments.

\* \* \* \*

Feature F5-12 is generally similar in all respects to segments of the north-south kitchen yard walkway previously found, and is very probably a part of that feature. Features F6-12 and F9-12 are more problematic. Are they earlier east-west trending walks? Or, are F9-12, F6-12 and F5-12 successively later iterations of a north-south trending walk which all terminated in approximately the same place?

The fact that F5-12 has such a cleanly delineated north margin suggests that it did, in fact, terminate here. If 6-12 and 9-12 were north-south trending, it is likely they would have terminated here for the same reason. If they were east-west trending, their progress further east would have been blocked by the structure that stood here.

Whether we are dealing one walkway feature or three separate ones, the interesting thing is that the termination point is halfway along the west portion of the eighteenth century foundation feature that formed the basis for the current kitchen

representation. The entrance to the representation is midway along the south face, where Outlaw (1973:5) reported finding a cobblestone step. The termination point of the eighteenth century walkway (or walkways) strongly suggests that there may have been an entrance to the structure along the west face. One can speculate almost endlessly about this. Was it the only entrance or an additional entrance? Did it lead to a separate section of the structure such a pantry, storage room or something not related in function to the kitchen? Or, was there an entry here to a living quarter above the kitchen, with either an interior or exterior stairway. Obviously, what we have in unit 7-12 cannot address these questions.

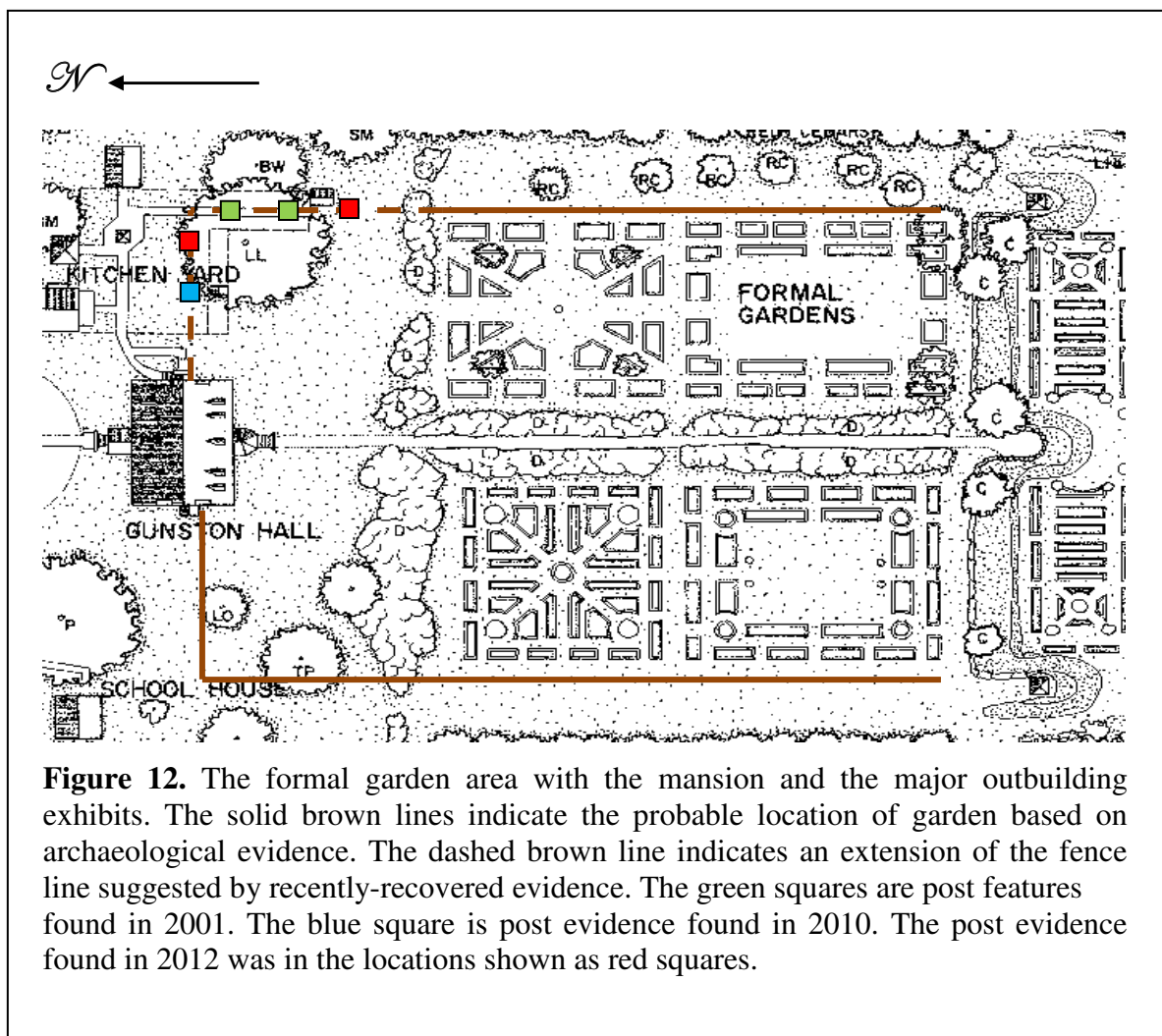
Likewise, not much can be said about the soil features other than they obviously pre-date the pebble features. They may, however, have had some relationship to the kitchen structure. It can be hoped that further excavation centered on EU 7-1 will clarify the relationships to the features exposed in this unit to each other and to the kitchen structure.



## Garden and Kitchen Fence

Earlier in the archaeology program, the remains of fence lines had been identified on both the east and west sides of what had been George Mason's formal garden (solid brown lines in Fig. 12). It was later found that the fence line on the west margin of the garden did not terminate at the north end of the garden. Rather, it continued to a point just short of the mid-point of the west wall of the mansion. It then turned 90° and joined the mansion wall on the south side of a basement entrance. At the time, no effort was made to determine whether the fence on the east margin of the garden also extended north.

It should be mentioned that the fence post holes and molds found on the margin of the garden share a suite of morphological characteristics that make them easy to identify



**Figure 12.** The formal garden area with the mansion and the major outbuilding exhibits. The solid brown lines indicate the probable location of garden based on archaeological evidence. The dashed brown line indicates an extension of the fence line suggested by recently-recovered evidence. The green squares are post features found in 2001. The blue square is post evidence found in 2010. The post evidence found in 2012 was in the locations shown as red squares.

(Shonyo 2011:20-22). The most prominent of these is the fact that the post molds were outlined with charcoal\*. The post molds were all spaced at ten foot intervals and were exactly aligned in a straight line, which is characteristic of early rail and paled fences.

Two additional post features with the morphology typical of the garden post features were found in the kitchen yard during a 2002 mitigation project (green squares in Fig. 12). These features were aligned with the post features previously excavated along the east margin of the formal garden. The features were 20 feet apart. However, the space between them had not been excavated, so it is likely that there is also a post at a ten-foot spacing.

During another kitchen yard mitigation project, this time in 2010 (Shonyo 2011:19-22), yet another of the characteristic post features was uncovered (blue square in Fig. 12). It appeared that a line running east-west through this feature would join the east side of the mansion at a point just south of a basement entrance. In fact, extending a line from the east garden fence line through the features excavated in 2001, making a 90° turn so that the line would run through the 2010 feature, and continuing to the side of the mansion (dashed brown line in Fig. 12) would produce a mirror image of the configuration of the fence line on the west side of the house.

It was felt that several additional post features would help legitimize the proposed fence line configuration. Therefore a 5' x 5' unit was excavated in the kitchen yard along the projected east-west line, and a second unit was excavated just outside the kitchen yard along the north south line (red squares in Fig. 12).

It was intended to place the kitchen yard unit (EU 9-12, N15E60) ten feet east of the unit in which the post feature was found in 2010. However, it was found that, in spite of assurances from the contractor to the contrary, this area had been dug up after the 2010 field season to make a drainage sump. The unit was therefore placed 20 feet east of the 2010 unit. A post feature was indeed exposed in this unit, albeit one that had

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\* The underground portion of the posts was apparently charred in an effort to deter the deterioration of the wood (e.g., Bealer 1996:49).

been badly disrupted by the roots of a nearby linden tree. The feature (F15-12) was 20 feet east of the post feature found in 2010 and evidence of charring of the post was present.

The second excavation unit (EU 11-12, S50E73) was placed along the north-south line running from the post features along the east margin of the garden and those in the kitchen yard (Fig. 12). A post feature here would provide a link between the two sets of features.



**Figure 13.** This post mold is outlined with charcoal, which is typical of those found on the margins of the eighteenth century garden. However, it is only about half the size of the latter. The post hole, which was only faintly visible, has been outlined here with a score mark.

A post hole and mold was, in fact, exposed in this unit (Fig. 13). The feature was first encountered at 1.22 feet below the unit datum corner, at the interface of the subsoil

and the overlying culturally disturbed strata. The mold was outlined with charcoal. However, it was only about half the size of other post remains in this series. Also, it was set about a foot to the west of the line that would join the garden post features with those in the kitchen yard. No explanation for this is apparent at this time. However, the soil immediately surrounding the post mold appears to have been disturbed and contains charcoal flecks, suggesting that the mold may represent a post that replaced an earlier one.

A rather interesting distribution of artifacts was seen in EU 11-12. On the west side of the unit, artifacts were rather sparse and consisted primarily of construction debris (nails, brick fragments, etc.). In contrast, the artifacts in the east side of the unit were relatively abundant and were typical those found in the kitchen yard (ceramic and glass shards, bone fragments, oyster shells, etc.). The line dividing the two assemblages was approximately where the north-south segment of the projected fence would have passed.

The identification of post features in and near the kitchen yard provide an unanticipated picture of how a part of the eighteenth century landscape may have been segmented. The garden fencing, in common with other elements of the formal landscape, now appears to have been axially symmetrical. It delineated not only the garden, but also the “bowling green” area adjacent to the south face of the mansion. It may well have signified a private, family space. The fence also appears to define the south boundary of the kitchen yard. In doing so, it demonstrates that the yard was not in reality as spacious as the current conjectural representation suggests. John Mason referred to this area as “a high paled yard” (Dunn 2012:59), so this segment was probably a paled fence. A paled fence, however, would not be consistent with the eighteenth century ideal of an open landscape. The remaining segments may well have been rail fences.

## Road Bed Deposits

The many disturbances inflicted on the Gunston Hall landscape during more than 250 years of continuous occupancy\* have made the finding of substantial deposits of exclusively Mason-era artifacts a rare thing indeed. Excavation was begun on one such area during the 2002 field season and continued, off and on, through the early part of the 2006 field season. Eventually, six contiguous 5' x 5' units were excavated here. The deepest of them were over four feet below the ground surface.

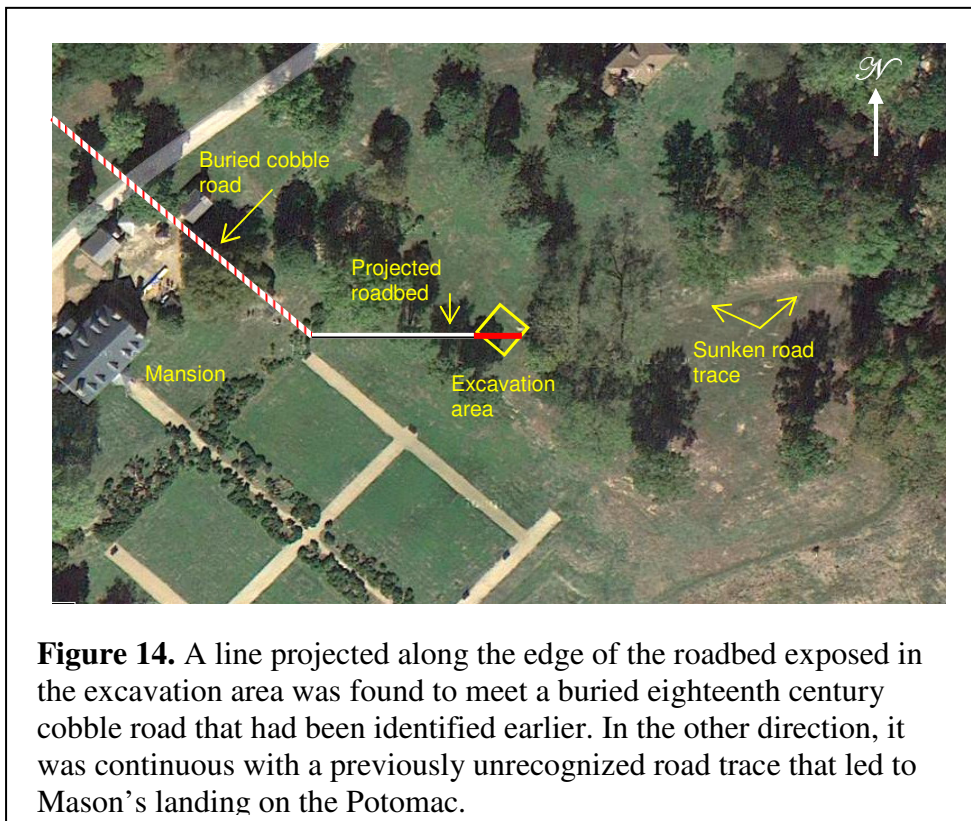
The area had once been on a slope. Sometime during the late nineteenth century, the ground surface had been leveled with fill soil, presumably for agricultural purposes. It is this blanket of fill soil that preserved the integrity of the deposits.

The deposits were located in an old road bed that, being on a slope, had eroded to a significant degree. Within the road bed were mounds of trash that appear to have been removed from elsewhere on the plantation. The character of the contents of each mound differed from the others, ranging from brick-making debris to household trash. One thing they all had in common is that the cultural artifacts were mixed with cobbles. The soil in the interstices between the mounds also contained artifacts, all of which were items which could have been present during the eighteenth century.

The artifacts in the mounds and surrounding soil appear to have been deposited sometime between 1770 and the mid-1780's. The *terminus post quem* (TPQ) artifact type was the neck of a style of wine bottle that was not manufactured before 1770 (Fig. 14) (Noël Hume 1961:101, 105). The *terminus anti quem* (TAQ) artifact is an artifact that was not present in the deposits: pearlware. Virtually any excavation at Gunston Hall will turn up pearlware. But, there was not a shard of pearlware, nor any ceramic type that appeared after pearlware, to be seen in the deposits. Pearlware was first marketed by Wedgwood in 1779 (Miller 2000:12). However, it did not reach Virginia until after the embargo on British goods was lifted at the end of the

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\* With the possible exception of a period during the Civil War.



Revolutionary War. Thus pearlware probably did not appear at Gunston Hall until the mid-1780's.

It was eventually discovered that the sunken road bed was a segment of a road that ran to George Mason's landing on the Potomac River (Fig. 14). When the course of the road was traced toward the west, it was found that it would have been continuous with a previously identified buried eighteenth century cobble-surfaced road. When the excavations were begun, the area just to the east of the excavation area was covered with bamboo, shrubs and trees. When this area was cleared, what was thought to have been a ravine was in actuality a road trace that was aligned with the roadbed in the excavation area. It was possible to follow the road trace onto an adjacent property (which was sold off the plantation in the 1870's) to what proved the site of Mason's landing on the Potomac.

Thus, the excavations enabled an understanding of an important road that linked the plantation to the river via the landing\*. The abundance of artifacts dating from a time when the plantation was at its peak also contributed to an enhanced understanding of the everyday material culture of Gunston Hall's inhabitants. One way in which this is publically manifested is in the fact that all ceramic currently on display in the mansion were acquired based on examples found in the deposits.

Still, a number of questions remained unanswered when excavations were suspended. For this reason, near the end of the 2012 field season, when other excavation objectives for the season had been met, two additional units in the excavation area



**Figure 15.** Unit 12-12 being excavated. The darker upper soil is nineteenth century fill, which helped protect the integrity of the deposits over the years. Two mounded deposits can be seen; the lower is primarily brick making debris and the upper is brick construction debris.

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\* Which was, according to John Mason, "...where all persons or things water borne, were landed or taken off..." (Dunn 2012:59).

were opened. The units, EU 12-12 (S185E190) and EU 13-12 (S190E188) were placed adjacent to and to the east of the previously excavated units. The excavations were not completed by the end of the field season, so work will continue there at the start of the 2013 field season.

In EU 13-12, only the nineteenth century fill was removed before closing the unit for the season. EU 12-12 was excavated to a maximum depth of 2.70 feet (Fig. 15), although it obviously goes deeper than this. The unit contained two mounded deposits. One of the mounds (the lower one in Fig. 15) was comprised mainly of cobbles mixed with an abundance of under fired and over fired brick fragments. They are apparently wasters from a brick making operation. The second mound contains primarily broken brick and globs of mortar. The mortar appears to have been poured or spilled on the ground before hardening. There is no mortar adhering to the bricks. All of this suggests that the deposit may be debris from a brick construction project. The soil between the mounds yielded an abundance of “household” artifacts – ceramic shards, bottle glass, bone etc.



## Summary and Conclusions

### *Carriage Turnaround*

The question of whether there was a carriage circle at Gunston Hall remains open, and it is likely to remain open unless some documentation emerges that can settle the matter one way or the other. However, we do now know that there was a pebble-surfaced turnaround area adjacent to the land front mansion entrance. We know the size and shape of this feature so that it could easily be replicated, if desired.

As was previously discussed, Mason may have decided that a full circle might interfere with the visual effects he created with the rather elaborate design of the approach to the mansion. In any case a circle was not really needed, as the roads that intersected the turnaround provided easy egress to the stables in one direction and an exit to the public road in the other.

It must be recognized, however, that the turnaround feature may actually be part of a full carriage circle. This would be entirely consistent with the model developed by Miervaldis (Fig. 7).

### *Kitchen Yard Walkway*

Excavations during the 2012 field season seem to indicate that the pebble kitchen yard walkway first exposed during the 2010 season terminated halfway along the west side of the eighteenth century structure that is now represented by a detached kitchen. As can be seen in Figs. 10 and 11 the walkway feature (F5-12) terminates cleanly, in a straight line. This suggests that it was intended to terminate at this point, and was not truncated here by some later disturbance.

The question of the relationship of F5-12 to F6-12 and F9-12 remains unanswered. Are the latter two earlier walkways laid at 90° to F5-12? If that is the case, they seem to be also heading to the mid-point of the west wall of the eighteenth century structure. Or are they earlier, perhaps wider, manifestations of F5-12, running in the

same direction as F5-2 and terminating in approximately the same place? It would also be of interest to determine what relationship the posts represented by Features F10-12 and F12-12 have to the walkway and the structure.

In any case, the evidence at hand suggests that there may have been an entry to the eighteenth century structure midway along its west wall. It would make more sense for a kitchen entrance to be on the kitchen yard (south) side of the building. Therefore, a west entrance may have been to a separate (non-kitchen) room or to a loft.

### *Garden and Kitchen Fence*

The additional post features exposed during the 2012 field season help support the proposition that the fence line that marked the east margin of the formal garden in the eighteenth century actually extended into what is now presented as part of a kitchen yard. There it made a 90° turn to the west at a point that, if continued in a straight line to the mansion, would meet the east wall next to a basement entrance\* (Fig. 12). This would be the mirror image of the fence line on the west side of the garden, and would be consistent with the axially symmetrical layout of the formal garden.

A fence of this configuration would have enclosed both the formal garden and the grassy areas adjacent to the mansion. It is likely the fence was meant not so much as a physical barrier as it was a means of marking off a private, family area. A segment of the fence would have also marked the south margin of the kitchen yard. This would mean that the eighteenth century kitchen yard would have been smaller than it is currently presented. The fence surrounding the current kitchen yard presentation is scheduled for replacement, and it is intended that the new fence will be erected along the line indicated by the eighteenth century post features.

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\* It cannot be verified archaeologically that the fence actually reached the wall because the basement of a nineteenth century frame addition to the mansion extended 30 feet from the east wall.

### *School House Area*

The curtilage boundary is an important landscape element, so an attempt to identify its location should be continued. The location shown in Fig. 8 is very logical, but is unsupported by physical evidence. The south terminus of the proposed margin is at the point where the constructed terrace meets the natural terrain. On the north end, it would seem to terminate just where the cherry tree avenue ended.

Defining the margins would also define the formally maintained area around the mansion. It might serve another purpose as well. According to John Mason, just beyond the “enclosed ground,” to the northwest of the mansion, there was a wood. And, just far enough into the wood so as to be out of sight was the slave quarter called “Log Town” (Dunn 2012:59). The site of Log Town has never been found. The establishment of the curtilage boundary might, therefore, provide a line of reference from which a systematic search for the site could be launched.

No obvious reason for the magnetic anomaly near the west wall of the schoolhouse structure could be discerned. The abundance of artifacts suggests that it may be near an entrance to the nineteenth century cottage that once stood in that location.

## Work Plan for 2013

### *Newtown (44FX955)*

Some 1,500 feet NNW of the mansion is the site of Newtown, the one-time seat of the Grandfather of the builder of Gunston Hall. According to Moxham (1975: 6) the grandfather, George Mason II (1660-1716), was established here “somewhat prior to 1692.” It is also one of several plantation homes later occupied in rotation by George Mason III (1690-1735). George Mason (IV) of Gunston Hall was born here in December, 1725\* (Copeland and MacMaster 1989:56). The house at Newtown appears to have been in use until 1761, and the above-ground evidence of plantation structures appear to have been gone by the end of the 1770’s.

Associated with Newtown was a Mason family burying ground. The first recorded burial there was that of George Mason III in 1735: the last know burial is that of George Mason’s aunt, Simpha Rosa Bronaugh, in 1761. On a visit to Gunston Hall in the early 1890’s, Mason biographer Kate Mason Rowland (1892:111) noted that the then owners of the property had “ruthlessly plowed up the old graveyard.” The exact location of the burying ground has been essentially lost to us since that time.

The Newtown site is located in an unmaintained wooded area overlooking Gunston Cove, an embayment of the Potomac River. The only previous archaeology done at the site was by Richard Muzzrole (1976) and by Southside Historical Sites, Inc. (Edwards, et al. 1977). Muzzrole excavated what he identified as the cellar of the Newtown house. He did not find any evidence of out buildings as a result of excavations immediately to the north and south of the cellar, but he did find some well brick. Edwards, et al (1977:12) express the opinion that that, “Based on Muzzrole’s finds, the evidence that the site is indeed Newtown is not entirely convincing.” They do not, however, elaborate on the reasons for questioning Muzzrole’s interpretation. The Southside group opened several excavations to the south of Muzzrole’s (Edwards, et al 1977: 12, 14, 16-17). The principle find was a six-foot square un-mortared stone foundation which was identified as the remains of a

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\* Some sources suggest other birth places.

smokehouse. The spoil piles and un-backfilled pits from this project remain on the site.

The management of Gunston Hall has now expressed an interest in opening the site to the public. Prior to that, a through archaeological exploration will be made. A surface reconnaissance was undertaken in early 2013. The areas disturbed during the Muzzrole and Southside projects have been identified, as has the possible location of the burying ground. A topographic map which the relevant Newtown-related features is in preparation. The wooded landscape features dense bramble thickets and deadfalls involving some sizeable trees, so a considerable amount of clearing will need to be done.

The total size of the site has not yet been determined, but it could be quite large. To keep site preparation costs within reason, a kind of modular approach will be used. A limited area will be cleared, surveyed with ground penetrating radar (GPR) and any necessary excavations done. Then, the process will be repeated in other limited areas until an adequate picture of the site has been achieved.

The first area to be addressed in this way will be the presumed burying ground. If the GPR cannot positively identify the depressions in this area as graves, then a relatively non-destructive means will be used to attempt to resolve the issues. Expert assistance will be used for this, if necessary. No attempt will be made to excavate possible graves.

### *Slave Occupation*

Almost no information has come down to us from Mason's time concerning the slaves or their living quarters at Gunston Hall. For this reason, the lives of Mason's slaves have been inadequately represented in presentations and exhibits at Gunston Hall. A major initiative is now being launched to rectify this. As one aspect of this, there are plans to construct a representation of one of more slave dwellings. Ideally, these will be as close as possible in appearance to their eighteenth century prototypes, and will stand on or near their original sites.

A problem with this is that no evidence of slave quarters has ever been found at Gunston Hall. The only documentary evidence we have are two brief comments in John Mason's recollections. The first comment was alluded to earlier in this report in the section concerning the curtilage boundary:

“The northwest side of the lawn or enclosed ground was skirted by a wood, just far enough within which, to be out of sight, was a little village called Log-Town, so called because most of the houses were built of hewn pine logs. Here lived several families of the slaves serving about the mansion house. Among them were my father's body servant, James, a mulattoe [sic] man & his family, and those of several Negro carpenters”. (Dunn 2012:59)

The comment on the second quarter is even briefer:

“To the east [of the kitchen yard] were the corn house and grainery [sic], servant houses (in them [sic] days called Negroe [sic] quarters), hay yard and cattle pens, all of [which] were masqued by rows of large cherry and mulberry trees.” (Dunn 2012:59)

Attempts have been made to discover the location of the Log Town quarter through shovel test pit (STP) surveys in the meadow to the northwest of the mansion (visible in Fig. 2), and in an area further west with the promising traditional name of Cabin Hill (Shonyo 2008:24-25). Neither survey found evidence of an artifact scatter that would indicate an eighteenth century occupation area. It is therefore intended to expand the STP surveys to previously untested areas to the north west of the mansion.

In 1953, James Knight, cross trenched 7,000 ft<sup>2</sup> of land in the vicinity of the Director's house under the direction of the restoration architect, J. Everette Fauber (1986:6). Cross trenching, as employed by architects, is intended to quickly find subsurface masonry and stone structures. However, it destroys or disrupts soil features, stratigraphy and the spatial relationships of artifacts. Fauber (1953:1) indicated that “that the Quarters were located... in the general area [of the Director's house], and of course, evidence bared by this excavation has, in a way, substantiated such structures in this area.” What was found here were two small masonry foundations and a cistern.

No mention is made of any attempt to date the items, and no reason is given as to why the structures should be accepted as being associated with a slave quarter. On the other hand, evidence may yet be forthcoming that will support this supposition.

In 2001, much of the area between the formal garden and the Director's house was surveyed using 2' x 2' test units at 20 foot intervals. After a certain point, the density of artifacts increased the closer the unit was to the Director's house. This certainly indicates the possibility of an activity area in the vicinity of the house.

The results of past excavations and tests in the vicinity of the Director's house will be reviewed in an attempt to ascertain any significant artifact distribution pattern and whether the artifacts recovered might indicate a slave occupation. Additional test units may be excavated if that is determined to be desirable. Phase III 5' x 5' units will be excavated in areas of high artifact density and any other areas that the test units suggest might be of interest.

#### *Road bed deposits*

These deposits are discussed elsewhere in this report. Work during 2013 will focus primarily on the road itself. In spite of the fact that six units were excavated during the period 2002 – 2006, the width of the road was not determined. That should be easily accomplished by excavating one additional 5' x 5' unit adjacent to the two units opened in 2012.

It has been projected that the section of the road that has been excavated would join the buried cobble road on the west and the sunken road trace leading to Mason's landing on the east (Fig. 14). During the 2013 season an effort will be made to ascertain whether this is actually the case. It is thought that a minimum of four 5' x 5' units will be required to do this.

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## **Appendix**

### **Identification of potential locations for slave quarters at a Virginia plantation using phosphate and potassium levels**

by  
Samuel Pell

## **Foreword**

In the spring of 2011, Sam Pell, a student at Cornell University, proposed undertaking a project to attempt to locate the sites of the slave quarters at Gunston Hall through an analysis of soil chemicals. The use of soil phosphorus has long been used, with varying degrees of success, as an indicator of intense human activity (e.g., Holiday and Gartner 2007). Gunston Hall agreed to a test project to determine whether this would provide a relatively simple and inexpensive method for identifying the sites of slave quarters and other activity areas at Gunston Hall.

A summary account of the project was given in the 2011 annual report (Shonyo 2012:25-27). At the time of that writing, however, a complete analysis of the collected data had not been concluded. Mr. Pell has since prepared a full report of the project, which is the subject of this appendix.

# **Identification of potential locations for slave quarters at a Virginia plantation using phosphate and potassium levels**

Samuel Pell

Under the supervision of David Shonyo, Director of Archaeology  
Gunston Hall Plantations  
Lorton, VA

## **Abstract**

Nitrate, phosphate, and potassium levels can often indicate human activity at archaeological sites. In this study, NPK levels were measured at ten-foot intervals over a 100 ft. x 100 ft. field. Nitrate levels were too low to be useful, but excavations were performed in three areas with high nitrogen and phosphate levels. Of these three areas, one appeared to be a colonial trash heap, another contained a few colonial artifacts, and a third showed little signs of human activity.

## Background

### History of the area studied:

- *John Mason's Recollections mention that the slave quarters and other outbuildings were on the east side of the house: "To the east was a high paled yard adjoining the house, into which opened an outer door from the private front, within or connected with which yard were the kitchen, well, poultry houses, and other domestic arrangements. And beyond it on the same side were the corn house and grainery, servant houses (in them days called Negroe quarters), hay yard and cattle pens, all of which were masqued by rows of large cherry and mulberry trees."*
- In the first half of the 20th century, the east of the house was converted into a tree farm. The area was plowed, causing vertical disturbance in the soil. It is not believed that any horizontal disturbance occurred across the area.
- In the 1950's, the director's house was built. When the septic tank was put in, remnants of a building were found, including a chimney. These ruins were destroyed in the construction of the septic tank.

### Review of literature:

Middleton, W. D. and Price, T. D. (1996) Identification of activity areas by multielement characterization of sediments from modern and archaeological house floors using Inductively Coupled Plasma-Atomic Emission Spectroscopy. *Journal of Archaeological Science* 23, 673–687

- Phosphate, potassium, Ca, Na, and Sr are shown to be good indicators of human activity in a Southwest Pueblo house in which tortillas are made.
- Phosphate and potassium are often linked.
- Wood ash contains high levels of potassium and magnesium.
- Excrement, plant tissue, and bone are the main sources of phosphate. They are normally removed from domestic contexts but would be present in a fire pit or trash area.
- Higher levels of potassium can be found in wood burning areas.

Weiner, S. *Microarchaeology: Beyond the Visible Archaeological Record*. New York: Cambridge University Press, 2010.

- Phosphate concentrations are high in kitchen areas, refuse dumps, and runoff from refuse dump (cites Terry et. al, 2004).
- Phosphate analysis ought to be used to support other, more reliable methods (224).
- Phosphates are relatively insoluble and immobile (224).
- Breakdown of organic matter causes a pH drop, whereas wood ash raises the pH (224).
- pH might be a good way to differentiate between different sorts of activity areas (224).
- Charcoal adsorbs molecules/ions from the environment in which it was located (226).

Halliday, V. T. and Gartner, W. G. (2007) "Methods of soil P analysis in archaeology." *Journal of Archaeological Science* 34, 301-333.

- Most phosphorus in a given soil sample is fixed (organic). Soil testing kits test "available," or water-soluble, phosphorus.
- Fixed P slowly converts to available P, whereupon it is absorbed by plants.
- Clays adsorb more phosphorus than sand. Phosphates will leach out of sandy soils, not clay soils. This is because clays have a higher surface area and are more highly charged than sand.
- Under a lot of weathering, organic P will circulate through the soil.
- The susceptibility of soil phosphate to dissolution, desorption, and transformation is affected by the levels of organic matter, pH, soil moisture, particle size, and mineral content.
- Black carbon, which results from the combustion of carbon, makes carboxylic acid. This acid helps break down organic phosphates.
- Organic additions of P quickly mineralize in lime-based soil. This means that measured phosphate levels may be artificially high if calcium carbonate is present in the soil.
- Hearths contain higher potassium levels than trash heaps.
- In one study reviewed (Fernandez et. al.), ash and discard elevated levels of K, Mg, and pH in the kitchen area, while organic table droppings lowered pH in the eating area.
- Sandy soils, certain parent materials and organic amendments, redoxymorphic conditions, a neutral pH, and time all favor soil P transformation and mobilization.

- Halliday and Gartner conducted a study in which they surveyed different P extraction methods in order to determine their relative effectiveness on different sites. They found that weaker acids (citric acid) were less effective at extracting phosphates from clay, but were effective at extracting them from wood ash. Stronger acids, such as perchloric acid and sulfuric-nitric acid, were especially effective at extracting organic forms of P. At one of the sites studied, large-scale land clearance at the planting surface did not affect soil P values below. They found that organic compounds in soil can artificially heighten the results if colorimetry is used as a testing method.

## Procedure

- A 100 ft. x 100 ft. field was surveyed and split into a grid. Grid points were logged into a computer, measured south and east from a reference point.
- Coring samples were taken at 10 ft. intervals in a grid pattern.
- 2-5 cores were taken per location to obtain 5-10 teaspoons of soil when dried. Topsoil was removed, as was the bottom layer of clay (if applicable).
  - o Topsoil was differentiated by color change and/or root density.
  - o Depths could range from 2 inches to 10 inches.
- Soil samples were dried overnight.
- Then, the phosphate, nitrate and potassium levels were determined.
  - o A LaMotte NPK soil test kit was used.
  - o The soil was crushed through a 1mm mesh and mixed
  - o Two Flock-ex tablets (formula unknown) were dissolved in 30 mL water, and a heaping teaspoon of soil was mixed in for 60 seconds and allowed to settle out.
  - o The resulting extraction mixture was separated into 3 test tubes and tested for N, P, and K.
    - + The nitrogen test was a trade secret.
    - + The phosphorus test involved a molybdenum complexation reaction.
    - + The potassium test involved forming a precipitate with tetraborate.
- Three areas with high phosphate and potassium levels were excavated (S90E275, S90E245, and S140E285). Three other areas were marked off and not dug up (S110E295, S130E295 and S50E295).
- 2 ft. x 2 ft. squares were marked out in these areas and were excavated.



## Results

Core samples were taken in ten-foot intervals over a 100 ft. by 100 ft. square grid. Samples were analyzed for their nitrate, phosphate, and potassium content, and any artifacts found in the core samples were also noted. Nitrogen was measured only in trace amounts, so nitrogen levels were not considered in this study. Potassium levels, phosphate levels, and artifact descriptions were displayed in a series of maps (Fig. 1). The grid points S90E275, S90E245, and S140E285 displayed high levels for both phosphates and potassium.

Two-foot square pits were then dug at these grid points. Table 1 displays the artifacts found within each inch of depth below the topsoil layer. Although the S90E245 excavation yielded some artifacts, a large number of beech walnuts were also uncovered. Indeed, this excavation site was located beneath a beech walnut tree. This suggests that compost from the tree, rather than colonial human activity, produced the high phosphate and potassium levels in this area.

The S90E275 site, on the other hand, yielded a wide variety of colonial artifacts. These artifacts were larger in size than those in the S90E245 site. A variety of ceramic fragments were found at the site, and several of them appear to have belonged to a single vessel. The variety, number, and size of the artifacts suggest that their proximity is not coincidental. Furthermore, no coal was found at the site, even though coal appeared to be scattered across the entire field (Fig. 1). This evidence suggests that the site was not disturbed in the nineteenth century, when coal was a common household waste product. Perhaps the site was a colonial trash heap. The area surrounding this site should be excavated.

The S140E285 site was also excavated. At 2.25 inches down, two fragments of pottery were found. Perhaps this site was a trash heap as well, though a more thorough excavation should be done. Small pieces of brick were found scattered across the entire field, in many different levels. It is impossible to ascertain when these brick fragments were added to the soil, because the field was plowed in the first part of the twentieth century.

The methodology of this study was flawed in many ways. First, the soil testing kit used was only accurate for about ten minutes. After that time frame, the color of the testing solutions began to increase artificially. It would often take in excess of 20 minutes for the soil to settle out of solution. The testing kit was clearly not intended for the dry, dense soil encountered in this study. If this study is attempted again, a different testing kit should be used. It also might be helpful to water the field with a sprinkler the night before data collection.

We encountered another problem that was also related to the dryness and high density of the soil. The coring tool could often penetrate but a few inches into the soil. At the S90E275 site, most of the artifacts were found four or five inches down. Watering the field before data collection may have improved the sample collection.

At the S90E275 site, however, high phosphate and potassium levels were detected despite the shallow coring samples. Perhaps the phosphate- and potassium-rich soils were dispersed throughout the soil strata when the field was plowed in the early twentieth century.

If the slave quarters are found, it would be useful to measure the pH levels at different activity areas, to determine whether pH is a useful tool for differentiating between activity areas. It is expected that fire pit areas should have a higher pH, whereas trash pile and eating areas should have a lower pH (Halliday et. al., 2007).

## **Conclusions**

Nitrate, potassium, and phosphate levels were measured across a 100 ft. x 100 ft. field, in order to determine the probable location of slave quarters. Nitrate levels were found to be too low to be of any use. Three areas were excavated because of their high potassium and phosphate levels. Of these three, one appears to have been a colonial trash heap, another contains a few ceramic pieces, and a third contains scant evidence of human activity. If this method is employed again, a different soil test kit should be used, and the field should be watered before data is collected. Overall, phosphate and potassium levels proved to be useful indicators of human activity areas.

## References

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Middleton, W. D. and Price, T. D. (1996) Identification of activity areas by multielement characterization of sediments from modern and archaeological house floors using Inductively Coupled Plasma-Atomic Emission Spectroscopy. *Journal of Archaeological Science* 23, 673-687.

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## Tables and Figures

| Phosphate Levels |      |     |     |     |     |     |     |     |     |     |     |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|                  | E205 | 215 | 225 | 235 | 245 | 255 | 265 | 275 | 285 | 295 | 305 |
| S40              | 2    | 1   | 2   | 0   |     | 2   | 1   | 3   | 2   | 0   | 2   |
| 50               | 3    | 2   | 3   | 1   | 0   | 1   | 0   | 0   | 1   | 4   | 1   |
| 60               | 3    | 1   | 2   | 1   | 1   | 2   | 1   | 3   | 1   | 3   | 1   |
| 70               | 3    |     |     | 1   | 1   | 1   | 0   | 0   | 0   | 1   | 1   |
| 80               | 1    | 1   | 1   | 2   | 2   | 3   | 3   | 2   | 3   | 3   | 3   |
| 90               | 1    | 3   |     | 2   | 4   | 3   | 1   | 5   | 0   | 3   | 3   |
| 100              | 2    | 3   |     | 2   | 3   | 3   | 1   | 2   | 2   | 2   | 1   |
| 110              | 1    | 2   |     | 1   | 1   | 1   | 1   | 0   | 1   | 5   |     |
| 120              |      | 2   |     | 2   | 2   | 2   | 2   | 3   | 2   | 2   | 2   |
| 130              | 1    | 1   | 1   |     | 2   | 1   | 3   | 1   | 3   | 4   | 2   |
| 140              | 1    | 1   | 1   |     | 2   | 2   | 2   | 2   | 4   | 0   | 2   |




| Potassium Levels |      |     |     |     |     |     |     |     |     |     |     |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|                  | E205 | 215 | 225 | 235 | 245 | 255 | 265 | 275 | 285 | 295 | 305 |
| S40              | 6    | 4   | 3   | 0   |     | 5   | 4   | 2   | 4   | 5   | 2   |
| 50               | 6    | 3   | 4   | 4   | 4   | 3   | 1   | 6   | 2   | 3   | 3   |
| 60               | 8    | 4   | 5   | 3   | 2   | 5   | 5   | 2   | 2   | 2   | 6   |
| 70               | 5    |     |     | 4   | 4   | 5   | 5   | 2   | 5   | 4   | 4   |
| 80               | 2    | 2   | 6   | 2   | 5   | 8   | 6   | 6   | 4   | 2   | 4   |
| 90               | 0    | 3   |     | 2   | 4   | 7   | 4   | 6   | 0   | 4   | 5   |
| 100              | 5    | 5   |     | 7   | 8   | 6   | 6   | 5   | 2   | 3   | 5   |
| 110              | 4    | 4   |     | 7   | 4   | 6   | 4   | 2   | 3   | 4   |     |
| 120              |      | 5   |     | 6   | 6   | 4   | 2   | 4   | 4   | 2   | 6,2 |
| 130              | 4    | 4   | 0   |     | 5   | 4   | 6   | 4   | 4   | 4   | 4   |
| 140              | 5    | 3   | 7   |     | 6   | 2   | 4   | 5   | 5   | 1   | 2   |

Figure 1. Potassium and phosphate levels over the grid. Colors (and numbers)

Figure 1. Potassium and phosphate levels over the grid. Colors (and numbers) were assigned so that the darker colors (and higher numbers) indicated a higher concentration. A blank square indicates that data was not collected at that point. See attached file for artifacts found.

**Table 1. Artifacts at Three Sites, by Depth**



S90E275

| Depth (in) | Artifacts  |
|------------|--|
| 1          | charcoal, brick, iron, white seed casing   |
| 2          | possible tooth, brick  |
| 3          | <p>piece of clay pipe, brick</p>  <p>scale: 1 line = .35 in</p>   |
| 4          | <p>white glazed ware, brown glazed ware</p>  <p>scale: 1 line = .35 in</p>                                |
| 5          | <p>large brick piece, white glazed ware, large charcoal piece, glass</p>  <p>scale: 1 line = .35 in</p> |

S90E245

| Depth (in) | Artifacts                                   |
|------------|---|
| 1          | coal, shellfish                             |
| 2          | beech walnut, rotted root, possible pottery |
| 3          | possible bone, nut, charcoal, glass shard   |

S140E285

| Depth (in) | Artifacts   |
|------------|---|
| 1          | rocks, brick<br><br>scale: 1 line = .35 in                   |
| 2          |   |
| 3          | glazed black and white pottery<br><br>scale: 1 line = .35 in |