Identifying Possible Outbuilding Locations at Chesterville Plantation

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Fall 2010
Introduction

Chesterville Plantation is an archaeological site in the modern city of Hampton, Virginia, on land now part of the NASA Langley Research Center. Chesterville was the birthplace and country home of George Wythe, signer of the Declaration of Independence and lifelong friend and mentor to Thomas Jefferson. The site has been listed on the National Register of Historic Places since 1973, thanks to a series of excavations and surveys undertaken by Dr. Frank Farmer, but very little research has been done of the property since those projects, which never resulted in a final write-up and as such remain poorly understood. Thanks to recent research with historic documents and the papers of Dr. Farmer, and to a recent archaeological survey undertaken by DATA Investigations LLC (Harpole and Brown forthcoming), our knowledge of the plantation history and landscape has been slowly improving (see various papers at http://crgis.ndc.nasa.gov/historic). This project is an attempt to address the arrangement of outbuildings on the plantation property, based on the results of the recent shovel test survey, through GIS-based analysis.

Background Information

This section is largely repeated from a recent paper (Callaway 2010), with some alterations because of the different focus of the current project. Before considering the current analysis, some background on our knowledge of the historic plantation landscape and buildings on it are necessary. On the modern landscape, the remains of two buildings associated with Chesterville are visible. One is a house foundation, mostly of stone, which was discovered during construction work in the 1970s and was the subject of archaeological excavation at that time. Based on artifactual evidence, this structure was believed by Dr. Farmer, the archaeologist who first studied it, to have been built in the 17th or 18th century and to have burned not long after 1764. (Eastman 1995) This is most likely the house in which George Wythe was born. The second building is the ruin of a later brick house which was for many years the main feature of the property. It may have been begun as early as 1771, when George Wythe
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placed an order for building supplies with London merchant J.H. Norton. (Wythe 1771) It still stood until 1911, when it was destroyed by fire. A single photograph of it exists, from 1905. The ruins of this house are still very obvious today, and stand roughly 4 feet high.

No other structures associated with the plantation are known. The route of the road which originally connected the plantation house to the former Back River Road is known from several maps and surveys (e.g. Quinn 1971) and has been confirmed by archaeological work, and beginning in 1809 we have a series of surveys and maps which give us some idea of the plantation boundary lines, but this represents all of our definitive knowledge about the landscape.

Beyond this, we must turn to the handful of written descriptions of the property which have survived to guide our analysis of the former landscape. The most complete of these descriptions is from 1795, when George Wythe placed a newspaper advertisement to sell the property. In it, he described “a large new convenient brick house,…a large negro quarter, a kitchen, stable, and store-house in good repair, and a grannary 60 by 28 feet...at which vessels of 60 tons may load.” (Wythe 1795) Another description comes from an indenture written in 1808 by then-owner Houlder Hudgins, in which he described the property as including “houses, gardens, orchards, waters, woods, and commodities” and “twenty Negro labors.” (Hudgins 1808) A few other descriptions similar to this can be found in various wills and deeds. Finally, a very minimal description comes from a letter written in 1915 by Sue Segar, who had grown up at Chesterville and been there when the American Civil War broke out. She principally describes the brick house already mentioned and the events of the war, but also mentions the presence of a smokehouse very near the main house. (Segar 1915) See Callaway 2010 for extended discussion of the larger landscape of fields, woods, and marshland on the plantation.

The shovel test pit (hereafter STP) survey on which the present analysis is based took place in the area immediately surrounding the two known structures (Figure 1, see also Callaway 2010). Note that the recent survey was undertaken at 50 ft intervals, and that the more tightly spaced samples near
the known buildings were performed in the 1970s by Dr. Farmer. The locations given for these two structures in Figure 1 are very approximate, with the later brick house (farther south) given as the fenceline which now surrounds the ruin, and the earlier stone foundation (north) as the approximate outline of the excavation units from the 1970s. A modern road runs between the two. To the north of the surveyed area is a lowlying marshy zone adjacent to the Back River, somewhere along which the wharf described by Wythe must certainly have been. To the south and east are modern NASA facilities, while the land to the west is largely open. Note also that at the western extreme of the study area is a small cemetery associated with the plantation owners from the 19th century, and at the eastern edge, where the road ends with a small loop, is the location given by Dr. Farmer on an unpublished map from the 1970s as the location of a “brick kiln,” though his reasons for this identification are unclear.

The purpose of the current project is to attempt to achieve a fuller understanding of the landscape investigated by the STP survey, with a specific view towards identifying possible locations for outbuildings in the study area. As such, architectural material (bricks, window glass, and iron) are the artifact types of interest, and an investigation of their distribution is attempted in the hope that it might shed light on possible outbuilding arrangements. Because the STPs are point data sources, their use to discuss broader trends requires that a continuous surface be estimated from them. There are many ways of doing this, as discussed below, and observation of broad trends in the data are then possible. Of course, large numbers of architectural artifacts need not indicate building locations, but could be dumps, areas in which rubble was used for fill, and many others (see Shiffer 1987, 280-281), but they may serve us as a useful point of discussion, especially when interpreted through comparison with roughly contemporary plantation landscapes.

Methodology

The artifact catalog was provided to me in a Microsoft Access database format (.mdb). It contained information about each “lot” of artifacts, with a lot defined as all artifacts of a single type
from the same context. These were coded with various identifying information about the artifact(s) being described, the number of examples, etc., and coordinates for the STPs in the local grid system used were provided separately. In order to manipulate the data in Arcmap GIS software, a shapefile was first created from the STP coordinates (Figure 1). These required some corrections (the x and y values were transposed in some, for example), and they were coded with the unique STP identifiers used in the catalog. The points were left in the local grid system for the duration of the analysis rather than reprojection into a standard one. Artifact data from the artifact types of interest were then selected from the catalog and saved as new .dbf files, imported into Arcmap, and joined with the STP file based on the unique identifiers. This resulted in point shapefiles of STPs with weight values for brick and counts for window glass and iron, for which weights were not recorded. Other artifact types were considered as well, but the sample sizes for most were determined to be too small for useful analysis, and those that were large enough, like ceramics, were not of interest. For the iron values, full counts of all iron artifacts were used, nearly all of which were either nails of various kinds or unidentified, but some small number were fasteners of other types or other iron artifacts. The window glass category includes only window glass, rather than including bottle and other glass as well.

In order to interpolate the point data to a continuous surface, several techniques were experimented with. One of the most commonly used methods is Inverse Distance Weighted (IDW), whereby the value at each cell is a function of the value at known points, with the weight of the different points used varying with their distance from the point being interpolated. This is a fairly quick method computationally, but is infamous for “scalloped” or “bulleye” effects caused by the values around any given point being pulled very near to its value. Figure 2a shows an IDW interpolation of iron values, with interpolated values based on a variable search radius including a minimum of 9 points. Another common method for interpolation is the Triangulated Irregular Network, whereby Delaunay triangles are created from the data points and a plane surface calculated
for each triangular facet. This avoids the “bullseye” problem of IDW, but tends to look artificially faceted. Figure 2b shows a raster created from a TIN model of iron values. Note that the general character of the interpolation is actually fairly similar to the IDW, but that it is more geometric and with anomalous values near other data points more evident. Other methods, including Kriging, were investigated as well, but it was ultimately decided that the method most appropriate for the analysis at hand was the TIN model, principally because of the irregular spacing of the data points, which causes problems in many other interpolation methods, and because local high values were less obscured.

In order to combine data on the three artifact types being investigated, TIN models were created from each and continuous raster surfaces from the TIN models. These were reclassified to 10 classes each using the “quantiles” method, which assigns class breaks in such a way as to distribute the pixels as evenly as possible across the classes. Thus, class 10 in each represents the highest fraction of pixels, and class 1 the lowest (Figure 3a-c). Finally, these three reclassified raster surfaces were added together using simple raster math, producing a combined result representing all three artifact categories (Figure 3d). This surface varies from a minimum of 3, in which all three surfaces were coded with class 1, to a maximum of 30, in which all three were class 10. This provides a useful look at the variation in architectural artifacts across the area surveyed. In Figure 3d, areas which had a final value of 27 or higher have been highlighted. Figure 4 is a flowchart showing schematically the operations performed in this project.

Discussion

First, a repeated caution not to assume that areas rich in architectural debris must have been at or near structures. Many other processes could have resulted in the deposition of this material at any given location (Schiffer 1987, 280-281), and they also need not have been related to buildings at all but could have served other purposes, except perhaps in the case of window glass. Furthermore, the artifacts under consideration bias our discussion of possible outbuildings very heavily toward those of a
more permanent character. Indeed, brick and window glass in particular are only to be reliably expected in large structures like the plantation house itself, with some occurring in permanent outbuildings such as kitchens and quarters, and many outbuildings and even houses contemporary with Chesterville may leave no more direct architectural trace than a few postmolds and perhaps a chimney (see various sites in Carson et al. 1981). We might constructively argue that even very simple structures would probably have a handful of nails in them but, again, nails do not occur exclusively in buildings.

Before considering the other categories of artifacts, some discussion must be devoted to brick (Figure 3a). Brick is perhaps the most problematic artifact type under consideration, because it is likely to be scavenged for building material or fill in areas largely lacking in stone, such as the Chesapeake. A few points on Figure 3a are of particular interest. First, at the southern extreme of the study area, directly south of the larger brick plantation house, is a very substantial spike in brick values, very much higher than any other point on the interpolated brick surface. Because this point is some distance from the house ruin, it is unlikely that it is directly associated with it, but it is important to note that this STP fell very near to, perhaps on, the route of the road connecting Chesterville with Back River Road. As such, though it is, of course, possible that this concentration of brick is associated with a building, I consider it much more likely that it represents fill associated with the road. North of this are several concentrations of brick which are most likely associated with the known buildings, or possibly with outbuildings very near them. One other feature of the brick surface merits further individual discussion: the high point which corresponds perfectly with Dr. Farmer’s “brick kiln” at the far eastern edge of the study area. Note that the large size which this concentration appears to have is a result of the isolation of the STP in question (see Figure 1), though some neighboring points produced substantial brick as well. This again raises the question of why Dr. Farmer identified this area as a brick kiln. It may be that at the time bricks were visible on the surface, which today they are not, and
he assumed that they were associated with the kiln which must have existed when the brick house was built. If this was his reasoning, other interpretations are very possible (reuse as fill, etc.), but he may have had information which we lack. Further research might elucidate this point.

We now turn to a discussion of the distribution of artifacts across the study area more generally. In considering these trends, it is useful to draw on examples of outbuilding arrangements at other sites. Glassie provides what is probably one of the most useful discussions (1972), and he identifies several common arrangements of outbuildings in the Mid-Atlantic. I will not describe these in detail here, but several common themes occur. The outbuildings described by Glassie tend to be grouped near one another on one side of the house, rather than centered on it, and generally are either arranged along a line passing through the house or around a de facto courtyard with the house at one edge. The other important structure in such arrangements was normally the barn, which would, for example, be directly across from the house in a courtyard arrangement. It is interesting that Wythe did not mention a barn in his advertisement, especially as Wells notes in an analysis of property advertised for sale in the Virginia Gazette that “barns are the most frequently itemized of all agricultural buildings.” (1993) However, many of the archaeological examples given by Carson et al. (1981) lack these structures, and many do not follow closely the typology suggested by Glassie, though the general trends noted above regarding the clustering of outbuildings near one another and on one side of the house seem largely to hold.

Given that we know that one of Wythe’s outbuildings was a wharf/granary and must therefore have been near the river to the north of the dwellings, it is reasonable to suppose that outbuildings in this period might have occurred largely in this direction, which is further supported by the fact that the brick house faces south, thus away from any outbuildings. However, it is equally reasonable to suggest the opposite, as the earlier structure is believed to have faced northwest and outbuildings may thus have been grouped away from the water, which would have been the primary method of transportation in the earlier period. The artifact surfaces generated do not resolve this issue, though some interesting points
can be made. High brick values (Figure 3a) occur to the north and more prominently to the west. Again, these need not be associated with building locations, though it is interesting to speculate that the concentrations to the west may represent a compromise between these two alternative facings.

Window glass (Figure 3b) occurs prominently in discrete locations on all sides of the known buildings. Some small amount of this is probably directly related to the houses themselves or to outbuildings very near them, but some clearly is not, including the numerous high points to the north and the isolated ones to the west and northeast. There is, of course, the strong possibility that some of these may represent discard locations for broken glass and other trash, though it seems unlikely that so many STPs to the north of the dwellings would have contained window glass for this reason.

Though it is spread more broadly over the landscape, iron (Figure 3c) displays many of the same trends as the other two artifact classes. High values occur in many parts of the study area, with particular concentrations near the known buildings and to the west and northeast of them. This is in some ways the least informative of the artifact classes, both because areas high in iron are not particularly well concentrated and because nails and other iron artifacts may be used for many non-architectural purposes, such as fencelines. Then again, in the current analysis this would be the only artifact class which might reflect unheated and windowless structures. Just as for window glass, discard sites are also possible interpretations for iron concentrations.

The sum of different artifact types (Figure 3d) is perhaps a more useful tool for discussing these spatial patterns. A remarkable number of locations in the study area fell into the highest classes of the summed surface. As discussed earlier, the concentration immediately south of the brick house I am prepared to dismiss as probably associated with the road, though other interpretations are very possible. The large concentration just to the east of the brick house I am tempted to interpret as rubble from the brick house itself, though it could very well also be a discard or fill area or outbuilding location. The concentrations to the north and west seem to me to be the best outbuilding candidates. Referring again
to the observation generalized from Glassie (1972) and Carson et al. (1981) that outbuildings tend to cluster near one another and the house to face away from them, it is possible to suggest that the arrangement of the Chesterville landscape may have changed after the new house was built with an orientation opposite to the older one, such that subsequently constructed buildings fell in a location which would previously have been unlikely. If this is so, those concentrations of architectural material in the southern half of the study area may represent outbuildings from this earlier period (perhaps even that which I have associated with the road, which if it dates to this period would predate that feature), while concentrations to the north, particularly those immediately between the older house and the river, may indicate later outbuildings. It is also interesting to note those sections of the study area which fall in the lowest class, many of which produced practically no architectural material whatsoever. These negative zones may indicate areas devoid of outbuildings on the Chesterville landscape, though the wide spacing of STPs makes this an admittedly dangerous assumption. However, if these areas did lack structures, they might be candidates for the location of a six acre orchard described by Wythe in the advertisement, which he indicated was “near to the dwellings.” (1795)

Conclusion

The interpretations which have been possible from the data at hand are, necessarily, very coarse in nature, but they might represent a useful starting place for future investigation of the Chesterville outbuildings. Such future projects might take several forms, though I would suggest that, given Chesterville’s largely unthreatened character, non-invasive geophysical analysis of various types would probably be most valuable, especially since these techniques make it possible to investigate large areas comparatively quickly and easily. If it proves possible to identify positively the locations of some number of outbuildings, they might usefully be interpreted in a framework like that described here, using their relationship with other structures and particularly with the houses to date their probable period of construction relative to them. This project represents a first attempt, using the data available.
Works Cited


Hudgins, Houlder. Indenture, December 22, 1808.


Segar, Sue. Letter to Winder, September 14, 1915.


Wythe, George. Advertisement in the Virginia Gazette, 1795.
Shovel Test Pits at Chesterville Plantation

Interpolated Iron Values, IDW and TIN Model
Artifact Surfaces Reclassified and Summed

A
Brick, by weight

B
Window Glass, by count

C
Iron, by count

D
Sum of all values

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Figure 3