**Site Structure and Slavery on Monticello Plantation in the Late-Eighteenth Century**

**1 Introduction**

A major innovation of the New Archaeology was the recognition that archaeological sites were not simply homogenous artifact mires but instead contained meaningful internal patterning (Belford 1964; Donnan 1962). Since then, most site-structure researchers have focused on the implications of this insight for synchronic spatial patterning (e.g., O'Connell 1993; Wandsnider 1996; Hutson and Stanton 2007). But the synchronic emphasis on this point with a second decade-long investigation into the patterning of temporary or semi-permanent artifact accumulations (e.g., Tainter 1988; Stanish 1985; Steponaitis 1989) has led archaeologists to propose that the study of site structure, especially spatial patterning in the distribution of artifacts in place, is a critical source of information about these site's occupational histories.

**2 Site 7, Site 8, and Monticello Plantation**

To illustrate the necessity of a diachronic approach to site structure, we draw on our work at Site 7 and Site 8 located on Thomas Jefferson's Monticello Plantation.

Site 7 was initially occupied around 1750 by a small group of slaves and an overseer, who grew corn. By 1770, Peter's son, Thomas Jefferson, had begun to develop Monticello Plantation. He built a new owner's house at Site 7 and had 144 quadrats of land where he built his house as well. Site 7 was abandoned about 1800.

Site 8 was initially occupied in the 1770s by a large group of slaves and an overseer, who grew tobacco. Site 8 has a much larger footprint than Site 7, with 266 quadrats of land. Safford site plan is associated with four structures (Str. 1-4) that have been excavated.

**3 Excavation Methods**

Stratified-random sampling of the plowzone was conducted by excavating a minimum of one 5-by-5 foot quadrat in every 20-foot sampling grid block across the sites. Additional quadrats were uncovered features and in areas where we expected to find features.

At Site 7, we have excavated 146 quadrats, while 264 quadrats have been excavated at Site 8. All sediment was screened through 1/4 inch mesh.

**4 Statistical Methods**

Spatial variation across quadrats in the frequencies of chronologically sensitive ceramic types is the key to our diachronic approach to site structure. But ceramic samples from each quadrat are small, ensuring that type frequencies are affected by sampling error. To see through this noise, we employ empirical distribution methods (Binford 1964). The idea is to estimate in-situ type frequencies in a given quadrat by “borrowing strength” from neighbors, or combining, according to Bayes’ Theorem. We chose a single-tailed test of the hypothesis that the type frequencies in a given quadrat with those in quadrats that fall within a surrounding spatial neighborhood (see inset).

With the sampling issue addressed, we turn to the problem of how to identify and interpret type-temporal variation in ceramics across site types. Correspondence analysis (CA) provides a solution precisely because it is flexible enough to detect multiple gradients that may have simultaneously existed in the past to condition variation in ceramic type frequencies (Keselmarysky et al. 2009; Smith and Neiman 2007).

**5 The Occupational Histories of Sites 7 and 8**

The CA results for the combined analysis of Sites 7 and 8 indicate one clearly significant dimension of variation (CA1) with another two possibly meaningful dimensions, as measured by the statistical significance of these dimensions.

Plotting the ceramic types along Dimension 3 reveals a temporal gradient, where Artifacts, for example, is located on the far right along Dimension 1; whereas, Porcelain is located on the far left.

**6 Exploring Synchronic Variation**

Before we can fully embrace the results just described, it is necessary to understand the variation captured by Dimension 1. Site 8 assemblages contribute the bulk of their variation along Dimension 2, so we analyze the sites separately.

The CA results for Site 7 indicate that Dimension 1 alone carries meaningful variation. The ceramic types plot and the plot of MCDs and CA Dimension 1 scores (Kendall Tau c=0.823, p < .001) show that the hypothesis that this dimension is temporal. It is possible that Dimension 2 also merits interpretation. Quadrats with a high Dimension 2 score fall on the southern end of Site 7 and are associated with ceramic types that are more refined wares than other contemporary neighbors. Does this mean we can now see how the locations of different groups of enslaved people lived and worked in the southern end of Site 7, creating the occupation we identify as Phase 2a.

**7 Discussion**

One important and unanswered question is what to make of the non-temporal variation observed across the combined analysis of Sites 7 and 8. Both sets of data are small, ensuring that type frequencies are affected by sampling error. To see through this noise, we employ empirical distribution methods (Binford 1964). The idea is to estimate in-situ type frequencies in a given quadrat by “borrowing strength” from neighbors, or combining, according to Bayes’ Theorem. We chose a single-tailed test of the hypothesis that the type frequencies in a given quadrat with those in quadrats that fall within a surrounding spatial neighborhood (see inset).

Under the second hypothesis, at the beginning of Phase 3b, a new household appeared on the southern end of Site 8, creating the occupation we identify as Phase 2b.

This household's assemblage was like the one found on the southern end of Site 7, distinguished by high proportions of redware and stoneware. Two households may have participated in the same ceramic supply networks, or may have shared members. Shortly thereafter, a second household was added, creating a different ceramic inventory. The southern end of Site 8, for example, is located on the far right along Dimension 1; whereas, Porcelain is located on the far left.

This model suggests a new group of enslaved people arriving with a separately-sourced ceramic assemblage. By the end of the occupation, the two residential clusters at the northern and southern ends of the site shared the same ceramic inventory and supply networks.

The evidence here is not yet conclusive. Our further investigations will include other artifact classes and will be based on the space and spatially grouped established here. We can say that statistical methods are key to constructing a complete history of household formation and spatial organization of these sites.