4. CLUES TO THE RELATIONSHIP OF THE RIVERBANK SITE (33RO1059) TO OTHER OHIO HOPEWELL SITES THROUGH INSTRUMENTAL NEUTRON ACTIVATION ANALYSIS ON POTTERY

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Abstract

Excavations were conducted at the Riverbank Site (33RO1059), located by the Hopewell Site (33RO27), in 2004 and 2006 to gather data from the site before it is eroded away by the Paint Creek and to improve understanding of the role of small sites located near large Hopewell earthworks. Instrumental Neutron Activation Analysis (INAA) was conducted on pottery from the Riverbank Site to help clarify its relationship with other nearby sites. Fifteen sherds from the site were sent to the University of Missouri Research Reactor (MURR) for INAA, and the results were compared to the larger database of Hopewell ceramics. Baed on the results, which show that the fifteen sherds formed a unique trace element compositional group, the site likely represents a short-term occupation, possibly for a pilgrimage to the Hopewell Site, and the ceramics were likely either locally constructed for use at the site or constructed elsewhere to carry items on the way to Hopewell.

Hopewell Social Organization

There are still many questions surrounding the cultures and manners of interaction that the Hopewell represent, especially with regard to the role of the mounds. The archaeological culture is known for a particular set of artifacts and constructs, though each site is still quite unique, and there has yet to be a description of a "typical" Hopewell archaeological site. Many of the mound groups do, however, share a concentration of exotic and possible prestige goods in common, so they were very likely congregating at these areas, sometimes from a distance and with distant materials (Bernardini 2004; Gibson 1994; Lafferty 1994; Spielmann 2002). This paper focuses on the Hopewell Interaction Sphere theory, introduced in 1964 by Hopewell archaeologist Joseph Caldwell.

Caldwell (1964) interpreted the archaeological designation "Hopewell" as one of the interaction spheres active in the prehistoric Americas, an idea that is still used today. These interaction spheres are exchange networks in which similar items are traded over large areas, creating the illusion of a continuous "culture" based on similarities in material culture over large areas. The proposed Hopewell Interaction Sphere covers an area of Eastern North America that spans from Ontario in the North to Florida in the South, and from New York in the East to Nebraska in the West. The interaction sphere

was centered in Ohio, where the majority of sites and highest concentrations of Hopewell materials ocurr (Seeman 1979).

The Hopewell Interaction Sphere is represented by a complicated archaeological record that is likely representative of complicated social organization and interactions (Lepper 2006; Pacheco and Dancey 2006). Bernardini (2004) characterizes their interaction on a regional level, with earthworks being built and used by the people living in a region rather than just those living close to the earthwork, based on patterns in earthwork construction and shape in southern Ohio. Additionally, each group of people likely used more than one earthwork. Evidence for pilgrimages to the earthworks raises questions about sedentism and mobility among those living in the Hopewell Interaction Sphere.

Cowan (2006) studied the lithic materials from Hopewell sites and found evidence for mobility. Bladelets are small, thin, and rarely retouched tools that were likely costly to produce. Bladelets were made out of high quality material, required a great degree of skill, showed no evidence of hafting, and display little use wear. This data suggests that they were only used a little before discard and were only suitable for some tasks. Additionally, there are few bifaces, which are more easily carried, unlike bladelets, which can be made with less preparation (Cowan 2006).

Burks and Pederson (2006) found more evidence for at least some degree of mobility in a study of habitation site materials and Hopewell Mound Group debris clusters. Debris clusters refer to assemblages of fire-cracked rock, debit age, and pottery that ocurr on or near the survace of earthworks. Debris cluster materials differ in that they are less dense than habitation site materials and are found over much smaller areas. Burks and Pederson interpret the debris clusters to be small camps that were inhabited for short periods of time by people who were visiting or building the earthworks.

The Riverbank Site (33RO1059)

The Riverbank Site (33RO1059) is loated just south of the Hopewell Mound Group on the Paint Creek (Bauermeister 2006). The Hopewell Mound Group consists of two large enclosures. The Great Enclosure, the largest, more or less follows the topography of the land, whereas the smaller enclosure is a square (Figure 1). There are at least 40 mounds within the enclosures, but the original number is unknown because some may have been plowed or otherwise removed (Greber and Ruhl 2000:11-12).

The Riverbank Site is considered part of the Hopewell Mound Group Unit, though it is not located on the mounds themselves (Bauermeister 2006). Hopewell Culture National Historic Park (HOCU) permited excavations at the site to assess the types of resources present before the Paint Creek erodes more of the site away (Bauermeister 2004). The earlier pedestrian survey revealed Middle Woodland and Hopewell artifacts, including bladelets. One of the features excavated during the 2004 project revealed some Hopewell rocker-stamped pottery, and another preserved Late Woodland artifacts. This suggested that the Riverbank Site represents several occupations and potentially held important information related to how the site is related to the nearby Hopewell Earthworks (Bauermeister 2004). The purpose of the 2006 season excavations

was to determine the type of settlement, its relationship to the Hopewell Site, and its relationship to other Middle Woodland sites (Bauermeister 2006).

Excavators uncovered ceramics in four features at the Riverbank Site, all but one fragment originating in three of the features (Figure 2). Pottery from two of these features refitted, showing them to be contemporaneous (Bauermeister 2006; Hammons 2006). Those same two features produced diagnostic Hopewell materials (Bauermeister 2006). The excavations uncovered 484 sherds from three features, yielding a minimum of seven vessels and nine body sherd groups that could not be associated with a particular vessel due to a lack of articulating rim sherds. The two contemporaneous features produced sherds from three Scioto Series, McGraw cord marked vessels, two Southeastern Series, Untyped Cordmarked vessels, and one Hopewellian Series, Chillicothe Rocker-Stamped vessel (Hamons 2006, Prufer 1968).

Speakman and Glascock (2003) analyzed 103 Ohio Hopewell pottery samples from seven sites, which include Harness, Hopeton, Hopewell, McGraw, Russel Brown, Seip, and Turner. All but ten sherds were assigned to one of six groups. The results of the INAA analysis on the Riverbank Site pottery were added to the results from the 2003 analysis to compare the assemblages.

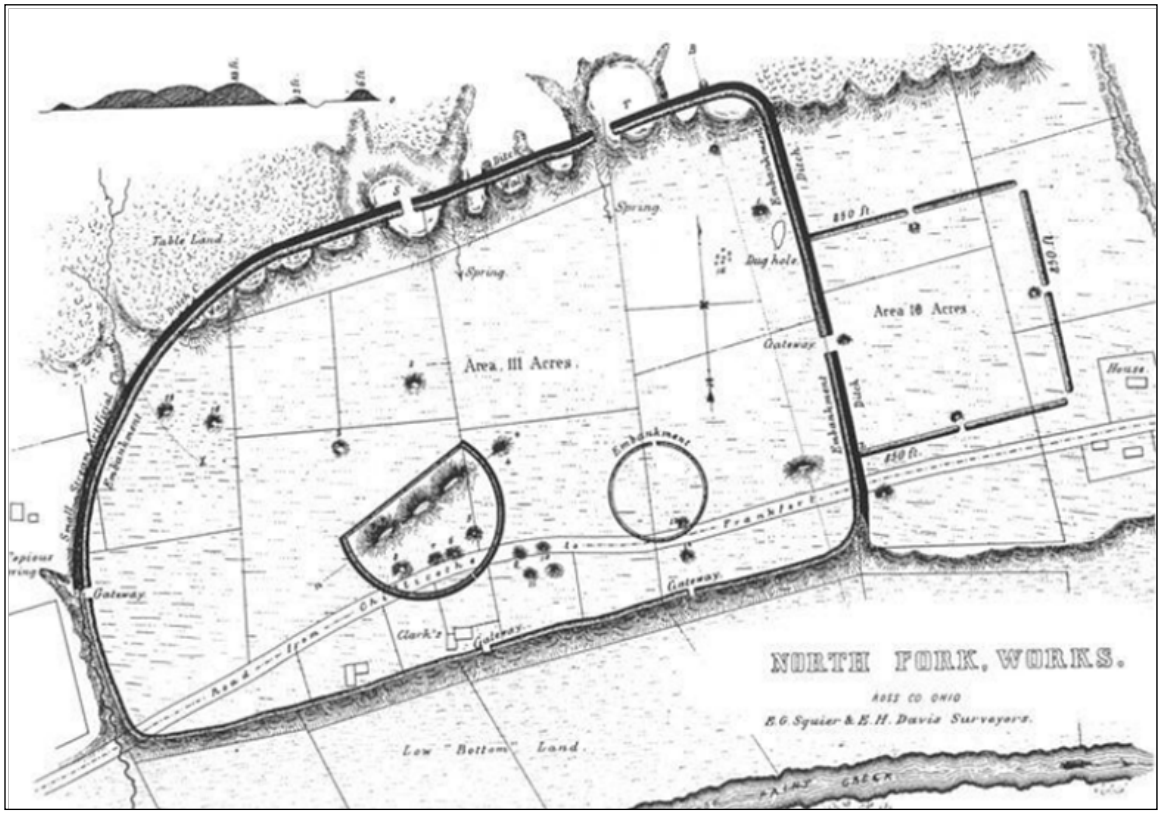

Figure 1: Map of the Hopewell Earthworks from Squire and Davis 1998 (originally published in 1848).

Methods

The Riverbank Bank Site assemblage came from three features: Feature 7, Feature 8, and Feature 10 in Block 1 of the excavations (Bauermeister 2006). Hammons (2006) analyzed the assemblage and largely based his typology on that of Prufer (1968). This analysis formed the basis on which the assemblage was sampled. One sherd from each of the identified vessels, with the exception of the vessel from Feature 10, which was too small, were chosen to be sent for INAA. In addition, the remaining nine samples were taken from each of the pottery groupings that Hammons identified, but that could not be articulated to a rim sherd. Each chosen sherd was assigned an identification number for MURR from RBS001-RBS015 (Table 1).

The sherds were sent by the Midwest Archeological Center (MWAC) to the MURR laboratory to be analyzed through INAA (for the procedure, see Glascock 1992). The conclusions in this paper are drawn from the data presented in the report from MURR (Ferguson and Glascock 2007). MURR used 33 elements (arsenic, lanthanum, lutetium, neodymium, samarium, uranium, ytturbium, cerium, cobalt, chromium, cesium, europium, iron, hafnium, nickel, rubidium, antimony, scandium, strontium, tantalum, terbium, thorium, zinc, zirconium, aluminum, barium, calcium, dysprosium, potassium, manganese, sodium, titanium, and vanadium) in the multi-variate analysis to compare the sherds from the Riverbank Site to other Hopewell sites. The results indicate that the ceramic sherds belong to the same compositional group. To demonstrate the results visually, Ferguson and Glascock (2007) plotted the concentrations of chromium and arsenic against each other on a scatterplot diagram because the concentrations of chromium were relatively higher and the concentrations of arsenic relatively lower than any of the other Ohio Hopewell ceramics. RBS001 at first appeared to be an outlier, with more chromium and less arsenic than the other samples, until Ferguson and Glascock (2007) overlayed the results from the Riverbank Site from the results from another site from another continent. RBS001 was well within the very tight compositional group of ceramics from the Riverbank Site (Figure 3).

Unfortunately, the 15 pottery sherds may not be a representative sample of the site, and there have so far been 118 total sherds included in the "Hopewell" analysis. Part of the Riverbank Site has already been eroded away by Paint Creek. Depending on how much of the site is missing and how homogenous the ceramics were distributed on the site, the sample may have missed some sherds from vessels that have a different composition. Additionally, during the block excavations, about 20 cm of soil was scraped off of the surface of the block by a backhoe, which also would have removed the top of the burn features. There may have been important data in that level that was missed. To improve this data, more samples from Hopewell sites will need to be analyzed through INAA to address any sampling errors.

Fortunately, the compositional clouds for the ceramic samples were very tight, moreso than other compositional groups (Ferguson and Glascock 2007). Due to the sample size being so small, 15 sherds, MURR was unable to perform a proper statistical analysis on the compositional group. They were, however, able to compare the Riverbank Site compositional group to many other groups and determine that the Riverbank Site ceramics were very similar.

MURR ID	Ware	Form	Paste	Temper	Decoration	Provenience
RBS001	Scioto Series, McGraw Cordmarked	Unknown	very dark brown	Grog	Smoothed Rough Cordmarking	Block 1, Feature 7
RBS002	Unknown	Unknown	very dark brown	Grit	Fabric-Impressed	Block 1, Feature 7
RBS003	Hopewellian Series, Chillicothe Rocker-Stamped	Unknown	light brown	Grit	Smothed Rocker-Stamping	Block 1, Feature 7
RBS004	Unknown	Unknown	very dark brown to light brown	Grit	Incised Chevron	Block 1, Feature 7
RBS005	Scioto Series, McGraw Cordmarked	Unknown	very dark brown to brown	Grit	Smoothed Cordmarking	Block 1, Feature 7
RBS006	Unknown	Unknown	dark brown to light brown	Grit	Smoothed Cordmarking	Block 1, Feature 7
RBS007	Scioto Series, McGraw Cordmarked	Unknown	brown to light brown	Grit	Coarse Cordmarking	Block 1, Feature 7
RBS008	Southeastern Series, Untyped Cordmarked	Unknown	brown to light brown	Grit	Smooth	Block 1, Feature 8
RBS009	Unknown	Unknown	brown	Grit	Smoothed	Block 1, Feature 8
RBS010	Unknown	Unknown	dark brown to brown	Grit	Smooth	Block 1, Feature 8
RBS011	Unknown	Unknown	very dark brown to light brown	Grit	Smooth/Smoothed Cordmarking	Block 1, Feature 8
RBS012	Southeastern Series, Untyped Cordmarked	Tetrapod	dark brown to brown	Grit	Smoothed Cordmarking	Block 1, Feature 8
RBS013	Unknown	Unknown	brown	Grit/Sand	Smoothed Coarse Cordmarking	Block 1, Feature 10
RBS014	Unknown	Unknown	very dark brown, reddish brown	Grit	Cordmarking	Block 1, Feature 10
RBS015	Unknown	Unknown	brown to light brown	Sand	Smoothed Cordmarking	Block 1, Feature 10

Table 1: A list and description of the sherds chosen for INAA.

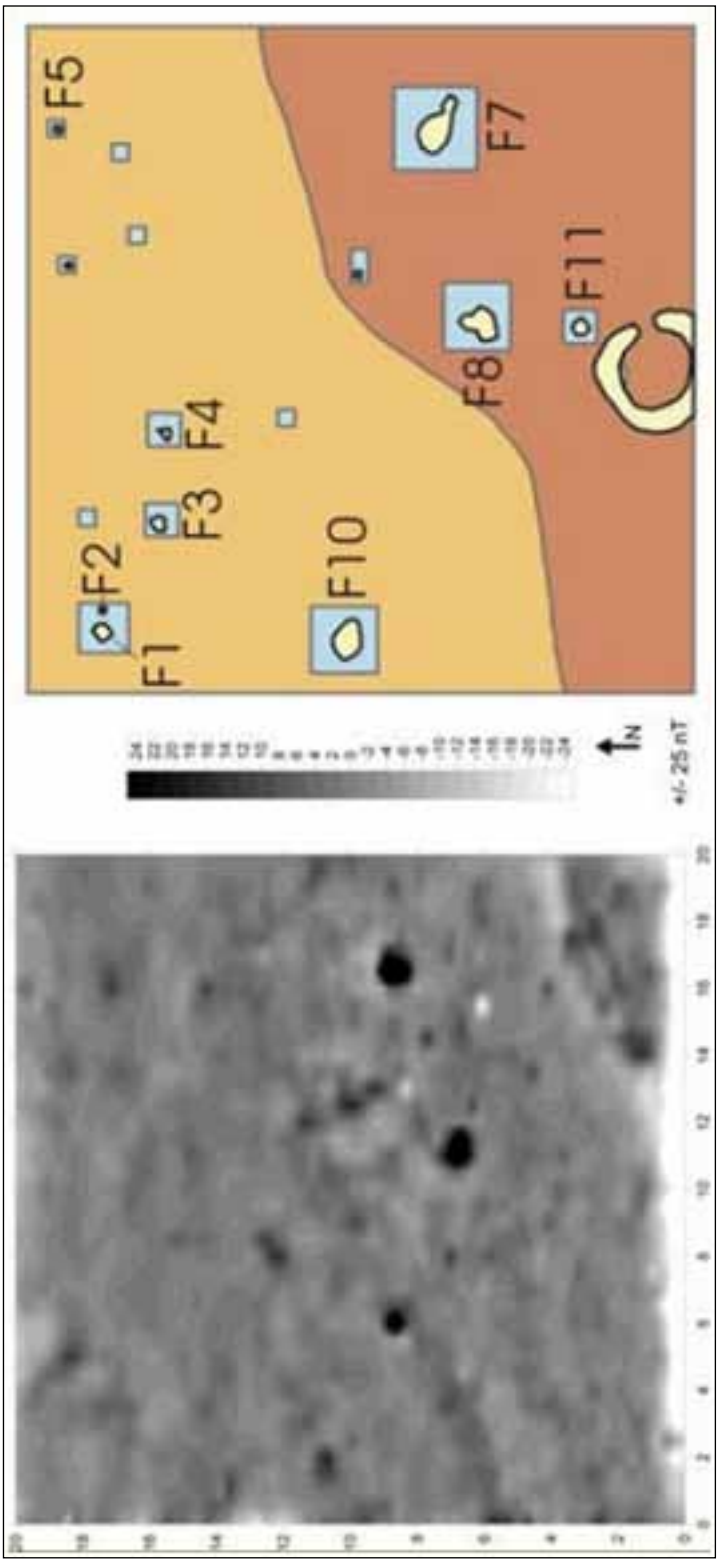

Figure 2: Locations of the Features in Block 1 at the 2006 33RO1059 excavations (Bauermeister 2006).

Discussion

There are a few possibilities for the origins of the ceramics. Considering that all of the ceramic samples share a common trace elemental composition, each identified vessel came from the same raw material source. None of the samples had a similar composition to any of the other ceramic samples from other contemporaneous sites, meaning that the Riverbank Site samples came from a different raw material source than the others.

The source could be a local clay deposit near with temper of unknown origin. Though it is difficult to transport raw clay (Mays 1961), some temper materials are easily transported over long distances (Lynott, personal communication 2007). Alternatively, the vessels could have been constructed at a different location and then traded or transported to the Riverbank Site because fired pots are relatively easy to transport (Mays 1961). One could also interpret the results to mean that there was no trade between the Riverbank Site and other sites because the Riverbank Site vessels did not overlap in composition with any other ceramics. The Riverbank Site might represent a short-term occupation for ceremonial purposes, given the ceramic composition and

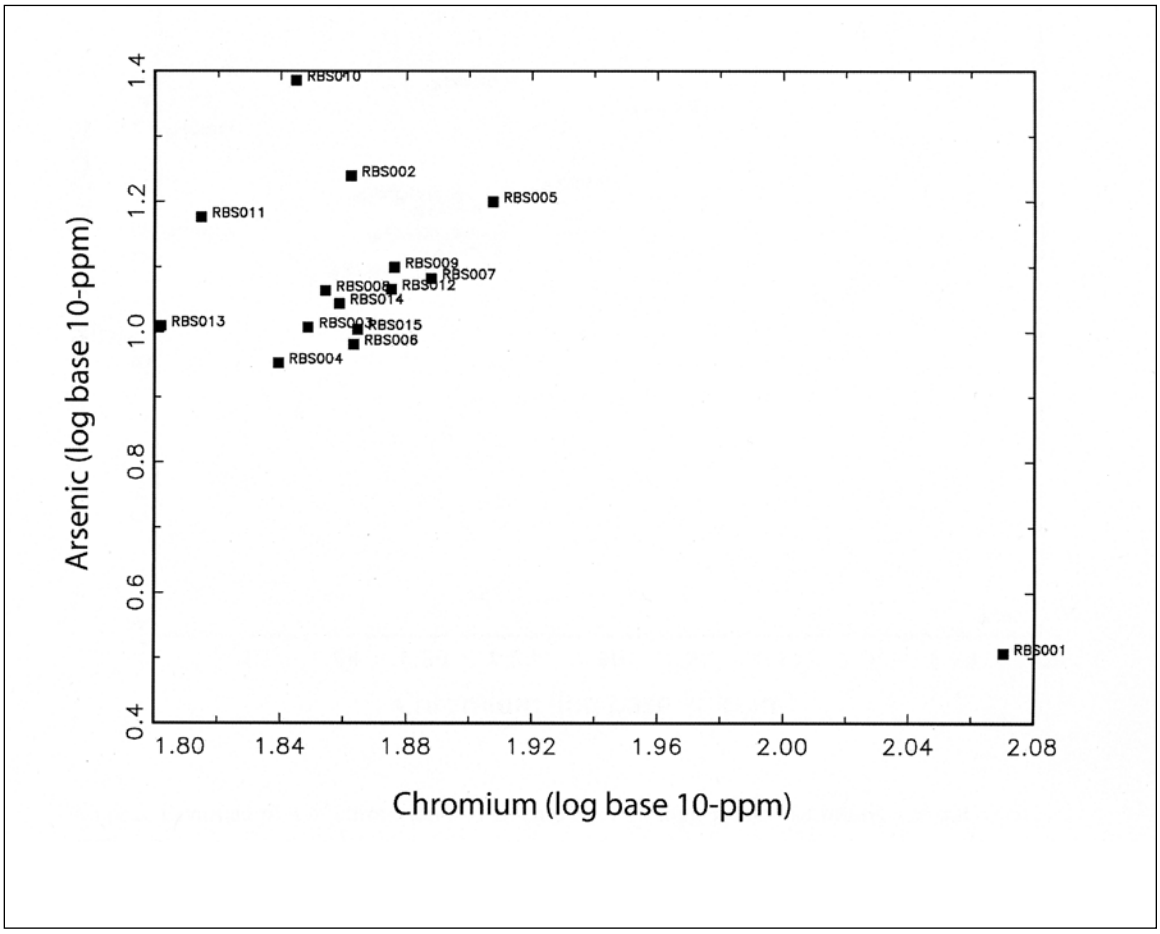

Figure 3: "Bivariate plot of chromium and arsenic base-10 concentrations following calcium correction" (Ferguson and Glascock 2007:13). Note that the compositional groups are formed through a multi-variate analysis.

other observations. Tetrapodal vessels, which at least one of the Riverbank Site vessels is, tend to be associated with ceremonial activities or areas (Greber and Ruhl 2000; Lynott, personal communication 2007). Additionally, the Riverbank Site is located very close to the Hopewell Mound Group, a major embankment earthwork complex that shows evidence of other short-term occupations (Burks and Pederson 2006). The Riverbank Site could represent another one of those short-term occupations, possibly for a group of people on a pilgrimmage, if the INAA results are representative of the entire assemblage. The only evidence of time at the site is two thermal features, each of which probably represents a few use events, suggesting that the location was not occupied for a long period of time. There is little evidence of long-term structures at the site. Though there are postmolds, there are not many, and there have yet to be distinguishable structures at the site (Bauermeister 2007). The excavations uncovered numerous bladelets, which have been interpreted as tools that one would find at short-term occupations due to the ease with which they can be manufactured (Cowan 2006). However, the site is more substantial than a debris cluster because the assemblage is much more diverse than fire-cracked rock, debitage, and pottery and extends beyond the surface of the ground (see Cowan 2006 for a description of debris clusters and Bauermeister 2007 for a description of the Riverbank Site).

Conclusion

This study was an attempt to help clarify the relationship between the Riverbank Site (33RO1059) and other Ohio Hopewell sites. In accordance with Bernardini's (2004) study that suggests that the earthworks were built and visited by people on a regional rather than a local level, it is possible that the Riverbank Site represents a short-term occupation for pilgrims to the Hopewell Mound Group who were either building or visiting the earthwork. Spielmann (2002) suggests that prestigious, exotic items were traded over long distances, and that certain places appear to have accumulated large concentrations of these items. The Hopewell Mound Group could represent one of these areas, given the concentrations of objects made by skilled people and from long distances, and the Riverbank Site a temporary settlement for people who went to gather at that special site.

If the site is indeed a short-term occupation, one could hypothesize that the ceramics were locally constructed at the site for ceremonial use there or constructed elsewhere to carry items on a pilgrimmage to the Hopewell Mound Group. In the future, more raw clay samples and ceramic samples should be collected to add to the database to attempt to locate the clay source and assess the statistical likelihood that the Riverbank Site ceramics are in the same compositional group. In this way, one could test the archaeological record to see where the raw materials originated. It would be interesting to widen the database, as well, to compare Ohio Hopewell ceramics to ceramics from other areas in Eastern North America. Archaeologists might then be able to see how far people or ceramics would travel, and this project could test whether the Riverbank Site ceramics came from a long distance.

Future research should also include paleoethnobotanical and faunal data to test for possible seasonal correlations to the site. If the site is a short-term occupation, it could be a seasonal occupation, as Yerkes (2006) suggests that many Hopewell

"settlement sites" really are. There is both paleoethnobotanical and faunal data available for the Riverbank Site. Finally, all future research should consider the implications of the potential sampling issues regarding erosion and block excavations.

Aknowledgments

I would like to thank Dr. Mark Lynott and Dr. LuAnn Wandsnider, my advisors, for all of their input and guidance in researching and writing this thesis. I would like to thank Ann Bauermeister of the Midwest Archeological Center for allowing me to send pottery from the project at the Riverbank Site (33RO1059) off for instrumental neutron activation analysis and for her encouragement along the way. I would like to thank Dr. Jeffrey Ferguson and Dr. Michael Glascock for the INAA report and suggestions. I would like to thank the University of Nebraska-Lincoln libraries for their assistance in helping me locate journals. I would finally like to thank the Midwest Archeological Center for funding the instrumental neutron activation analysis.

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