An Archaeological Analysis of the Swennes Upper Garden Site: Temporal and Seasonal Indicators

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ABSTRACT

The Oneota were a prehistoric agricultural people who occupied the La Crosse area from A.D. 1300-1625. Unlike the major summer Oneota villages that have been excavated, the Swennes Upper Garden site (47Lc333) is located in an interior valley instead of on a terrace of the Mississippi River. Four seasons of excavations at the site have identified 29 features and provide a sample for analysis. This paper examines two specific research problems: the seasonality during which the site was occupied, and the specific phase(s) of occupation. Analysis of a sample of the plant and animal remains are used to evaluate what season(s) the site was occupied. Diagnostic decorated pottery is used to identify specific phase(s) in the Oneota culture and suggest if the site was from a single or multiple occupations. Two radiocarbon dates have been acquired from two different features to give the site specific dates. Due to the unique location of the Swennes Upper Garden site, this paper gives us an opportunity to identify some more poorly understood aspects of Oneota culture, such as identification of a winter occupation.

INTRODUCTION

Oneota is the name that archaeologists give to the cultural remains left behind by the people who occupied the La Crosse area from A.D. 1300-1625. The Oneota people were agriculturalists of corn, beans, tobacco, squash, and sunflowers as well as hunters and gatherers in the Mississippi River area (Theler and Boszhardt 2003). In the La Crosse area, the Mississippi Valley Archaeology Center (MVAC) at the University of Wisconsin-La Crosse has excavated many substantial Oneota summer villages such as the Pammel Creek (47Lc61), Sanford Archaeological District (47Lc394), Valley View (47Lc34), and Sand Lake (best known from the large ridged field complexes (Sasso et al. 1985)) (47Lc44) sites. Most of the early Oneota villages are located on the river terraces and then move away from the river towards the bluffs nearing the end of their time in the La Crosse area. However, most of MVAC's research (Arzigian et al. 1989; Arzigian et al. 1989) suggests that the villages were predominantly spring-fall occupations, with little evidence of winter use. Rather, it is argued that much of the population moved west into the Plains about 60 miles west of La Crosse for a winter bison hunt. After the break up of ice on the Mississippi River and the arrival of spring, the Oneota people probably returned from the west bringing with them items such as bison scapulas that were used as hoes in the summer gardens, worked bone tools such as a bison rasp, and they undoubtedly brought back other things such as bison hides and probably some dried meat.

The Swennes Upper Garden site, 47Lc333, located near the town of Holmen in La Crosse County, Wisconsin, was first excavated in 1995 and again in 2004, 2005, and 2006 by MVAC. These excavations opened up 29 features, mostly storage pits and hearths that date to the Oneota culture. The first research question examined in this paper is the time period which the site was occupied. Also examined is the floral and faunal remains to try to determine the seasonality during which the site was occupied. The Swennes Upper Garden site looks like it might have been a campground for short-term activities and may have served as a winter base camp. Along with it possibly being a different season, 47Lc333 is located on a different landscape than all of the other known Oneota sites. Thus it provides important information about the Oneota seasonal round.

Environmental Background

Long Coulee is located in the unglaciated Driftless Area of Southwestern Wisconsin and unlike the other major Oneota villages, the Swennes Upper Garden site is located off of the Mississippi River terraces and set in an interior valley.

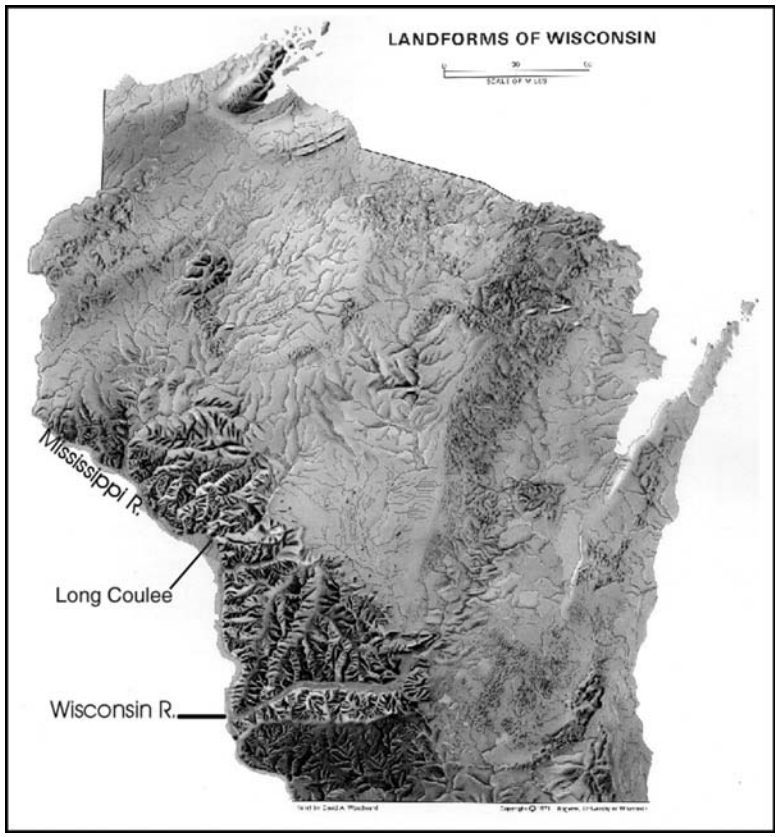

Figure 1. Location of Long Coulee in the Driftless area of Wisconsin.

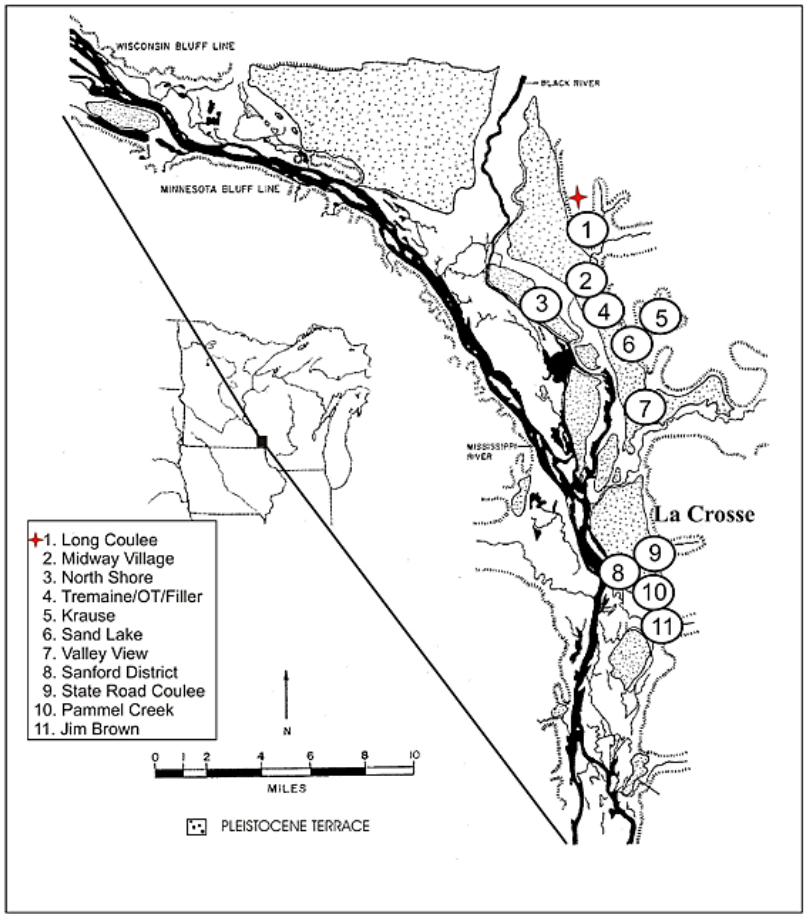

Figure 2. La Crosse locality, Oneota sites.

The Driftless Area includes much of the Western Upland and portions of the Central Plain and Northern Highland (Martin 1965). Three physiographic zones are present in the immediate area of Long Coulee: dissected uplands and bluffs, Pleistocene terraces, and the lowland floodplains of the Mississippi River (Arzigian et al. 1989). Robert Patrick Stewart states in *Archaeological Investigations in Long Coulee La Crosse County, Wisconsin: The 1995 Season,* that there are a variety of landforms present within the Long Coulee drainage basin; upland summits, both narrow spurs and broad, well rounded ridges; slope segments vary from short and steep along the western margin to lower gradient with longer profiles in the east; and a number of terraces associated with the Long Coulee stream (Burkart and Woolley 1996:4). The Swennes Upper Garden site is located on top of a terrace that overlooks the Casberg Coulee Creek. Casberg Creek below the site is fed by a spring upstream that local residents describe as usually running all winter (Arzigian, personal communication).

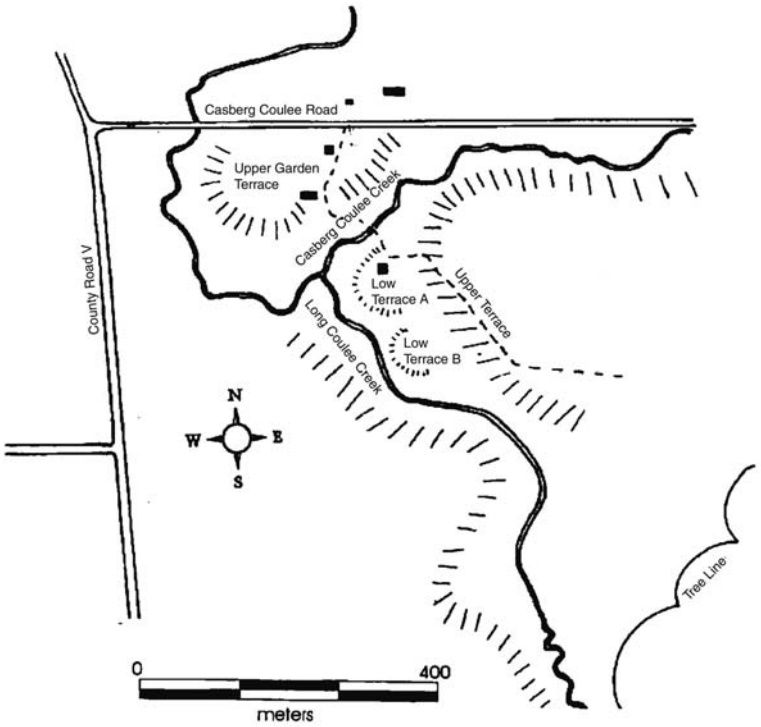

Figure 3. Map of the Swennes Upper Garden site (Burkart and Woolley 1996).

Casberg Coulee Creek empties into the Long Coulee stream which is a tributary of Halfway Creek. Halfway Creek empties into the Black River as it travels down the eastern edge of the Mississippi River trench (Burkart and Woolley 1996:4). The Long Coulee drainage basin has a valley length of slightly more than four miles with the maximum basin relief of about 600 feet within that distance. Long Coulee stream experiences a drop in elevation of approximately 16 feet per mile (Burkart and Woolley 1996:5).

Soils of Long Coulee

Arenzville silt loam is the soil type located on the floodplain of Casberg Coulee Creek, as well as on the floodplain of Long Coulee Creek and Moe Coulee Creek (Burkart and Woolley 1996:5). The Arenzville soils are important due to the presence of a buried soil profile which seems to correlate with the profiles recorded during the 1995 field school. The Arenzville soil occurs on the first level terrace and sometimes contains the buried soil associated with the Oneota Settlement Alluvium (Burkart and Woolley 1996:6). The Arenzville series consists of very deep, moderately well drained soils which are moderately deep or deep to a buried soil formed in mostly light-colored, relatively recent (post-settlement), mostly silty alluvium overlying buried soils with dark colored A horizons (National Cooperative Soil Survey 2006). A profile of Arenzville silt loam would consist of:

A--0 to 25 centimeters; dark grayish brown (10YR 4/2) silt loam with thin strata of yellowish brown (10YR 5/4) and very dark grayish brown (10YR 3/2) silt loam, light brownish gray (10YR 6/2) dry; weak medium granular structure; friable; neutral; clear smooth boundary. (12 to 39 centimeters thick)

C--25 to 64 centimeters; stratified brown (10YR 5/3), dark grayish brown (10YR 4/2), and very dark grayish brown (10YR 3/2) silt loam; massive breaking to medium plates along depositional strata; friable; few thin lenses of very fine sand; slightly acid; abrupt wavy boundary. (25 to 64 centimeters thick)

Ab--64 to 102 centimeters; black (10YR 2/1) silt loam; weak medium platy structure parting to weak medium granular; friable; few fine prominent brown (7.5YR 4/4) masses of iron accumulation; slightly acid; gradual smooth boundary. (12 to 62 centimeters thick)

C'--102 to 152 centimeters; dark grayish brown (10YR 4/2) silt loam stratified with a few thin lenses of fine and very fine sand; massive breaking to thick plates along depositional strata; friable; common medium prominent

brown (7.5YR 4/4) and dark reddish brown (5YR 3/4) masses of iron accumulation and common medium distinct grayish brown (2.5Y 5/2) iron depletions; neutral (National Cooperative Soil Survey 2006).

Vegetation of Long Coulee

The vegetation of Long Coulee during prehistoric occupation would have been oak savanna on the bluff tops, mesic forest on the northern slopes, and drier forest to savanna on the southern slopes, with some wetlands forest vegetation along the stream (Curtis 1959). The trees in the area would have been useful for fuel and building materials. The terrace of the Swennes site, itself was probably prairie grasses.

METHODOLOGY

Field Procedures

The Swennes Upper Garden site, 47Lc333, located near the town of Holmen in La Crosse County, Wisconsin, was first excavated in 1995 and again in 2004, 2005, and 2006 by MVAC at the University of Wisconsin-La Crosse. These excavations opened up 29 features, mostly pit-type features and hearths that date to the Oneota culture.

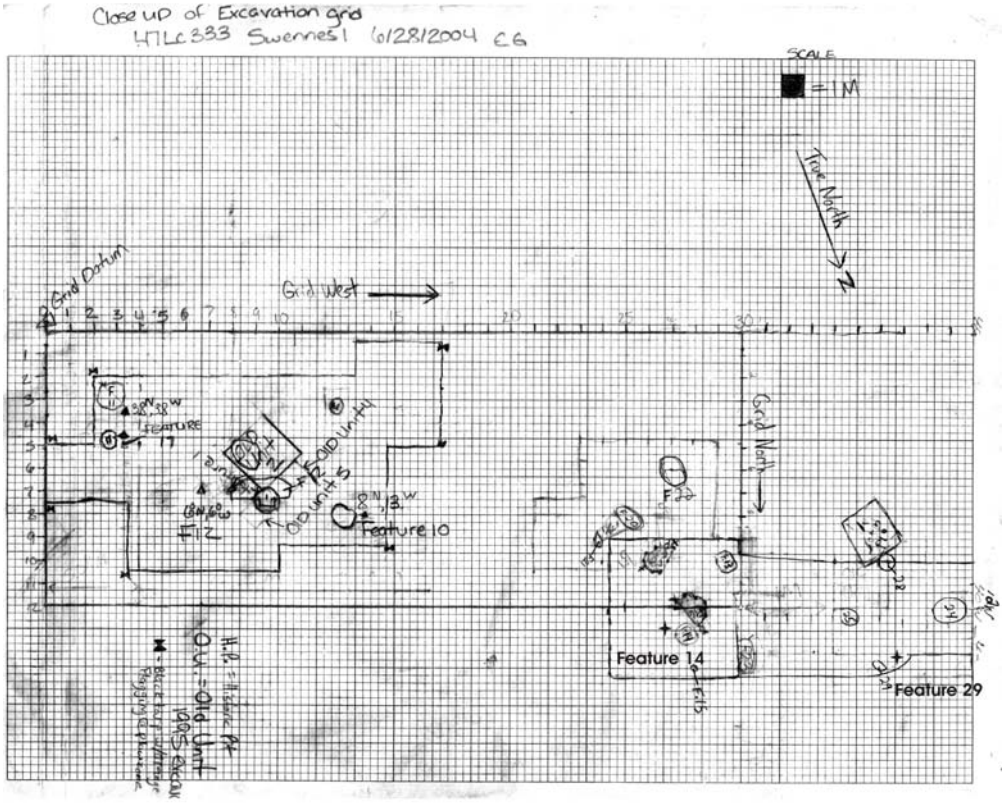

Figure 4. 47Lc333 Sitemap.

The features were found by removing the plow zone by hand with skim shovels and identifying stains in the soil at the base of the plow zone. All features were mapped in plan view.

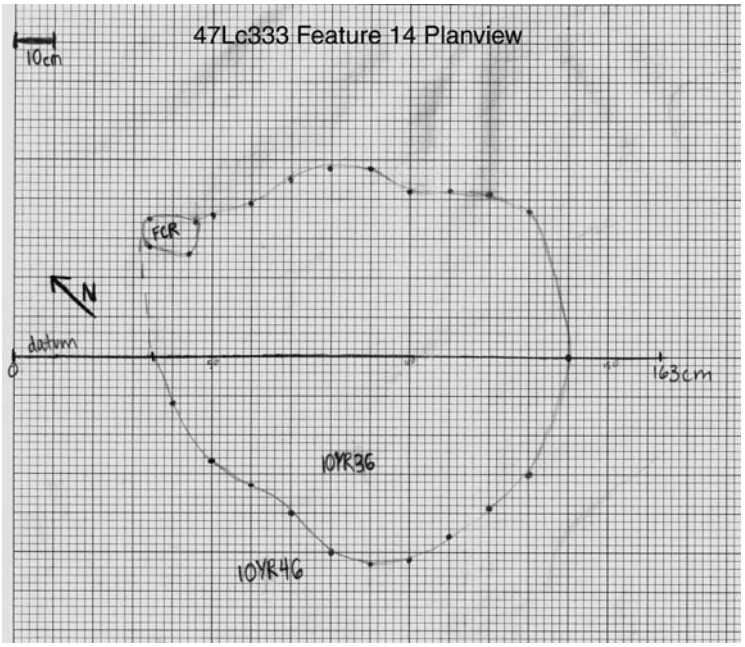

Figure 5. Feature 14 plan view map.

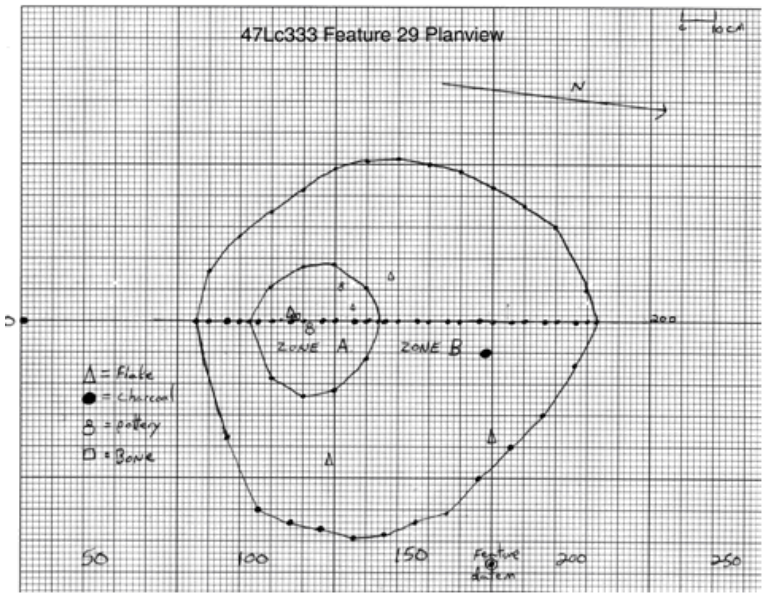

Figure 6. Feature 29 plan view map.

The features were bisected across the longest part of the feature. The first half of the features was excavated in arbitrary levels of five or ten centimeters. The features' profiles were then mapped and photographed. The second half was excavated in levels of five or ten centimeters and in cultural zones.

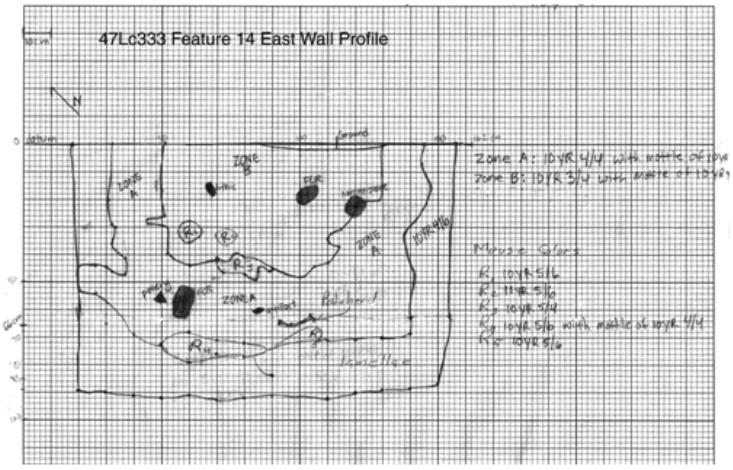

Figure 7. Feature 14 profile map.

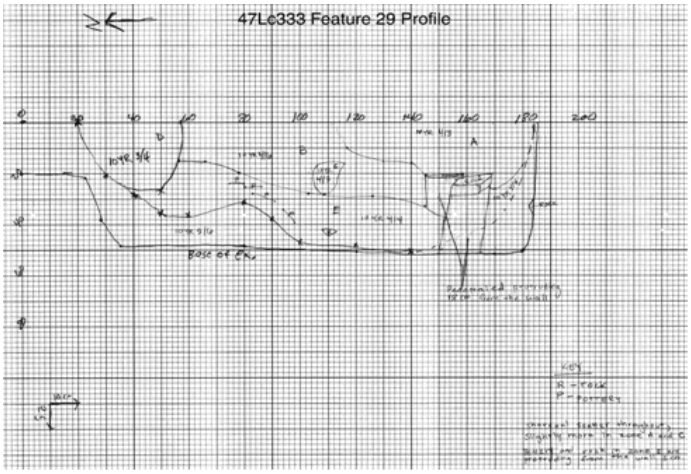

Figure 8. Feature 29 profile map.

Figure 9. Author sitting in the excavated half of feature 14.

See Appendix B for summary of excavations for feature 14 and feature 29. All of the soil from the features was put through a ¼-inch screen or was collected as matrix samples for flotation. The work at the site is ongoing and not all features have been fully excavated as of spring 2007.

Lab Procedures

The recovered artifacts were taken to the MVAC laboratory to be cleaned and catalogued. Artifacts were catalogued on MVAC's standard catalogue sheets (Appendix A). Each sheet was assigned an acquisition number which correlates with the excavated levels of all features. Ceramics were categorized as either undecorated body sherds, or rims, handles, or decorated body sherds. Lithics were categorized as tools and lithic debris. The shell-tempered pottery of the Oneota can be separated into three different phases by looking at the rim, handle and decoration on the vessels (Boszhardt 1994). An analysis of the pottery will determine the Oneota phase(s) that are represented at the site. An analysis of the lithic raw material will also help distinguish between the three Oneota phases.

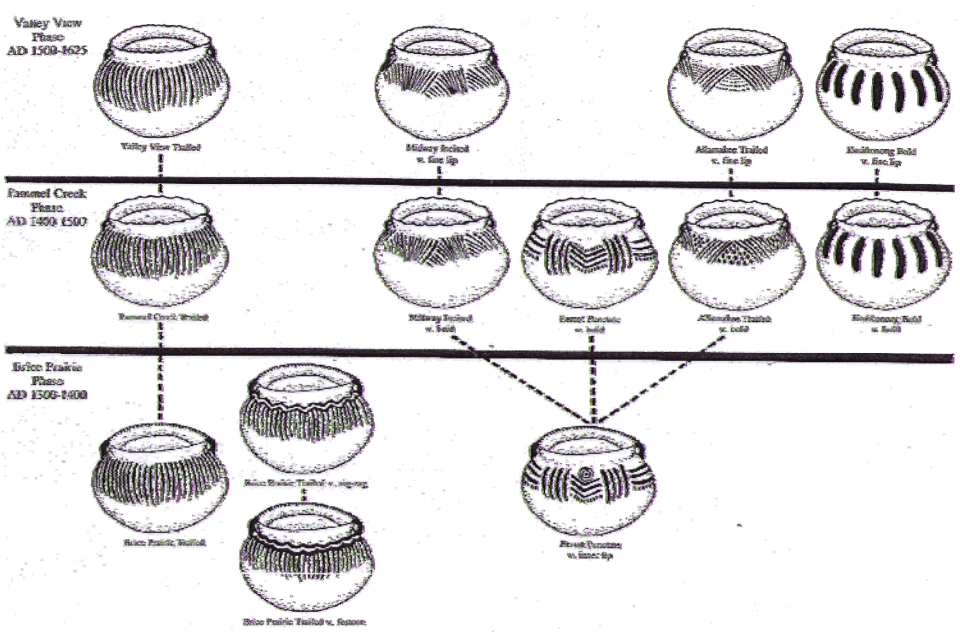

Figure 10. Oneota ceramics phases (Boszhardt 1994).

Soils returned to the lab as matrix samples were floated to recover plant and animal remains that can be used to help understand the seasonality of the site, as well as document subsistence strategies and reconstruct the local environment. The flotation process separates the charred plant remains from the rocks and bones. The matrix samples were dried and then placed in a clean bucket. The bucket is filled with water, and the lighter charred plant remains float to the top of the bucket. This light fraction is then sent through a 40 mesh screen, 0.425 millimeters. The heavier rocks and bone sink to the bottom of the bucket. This heavy fraction is also put through a 40 mesh screen. With the help of Dr. Constance Arzigian, a floral specialist, I have sorted out the charred non-wood plant remains, under a microscope from powers 6.7 to 40, from a sample of the features to determine what plants were present during the time of occupation. With many species of plants it is hard to distinguish if the seed is archaeological or modern. Goosefoot, *Chenopodium,* was tabulated for because it is hard to determine if it is charred or not charred. Although it has been tabulated, I am unimpressed with the archaeological integrity of the seeds. The *Silene* seeds are modern, the seeds were broken open and either a modern embryo or no embryo was found inside, none of the seeds had a charred embryo that would indicate that the seed was archaeological. The *Oxalis* was also tested and seemed brittle, these seeds may be archaeological. I have looked at all of the diagnostic lithics and ceramics from the site, and based on the presence of both diagnostic artifacts and subsistence remains, chose two features, 14 and 29, for more detailed analysis of the plants and animals.

I sent in two samples of wood charcoal, that were selected from zones containing diagnostic ceramics taken from both light fractions and the charcoal recovered during excavation, from feature 14 and feature 29, to the Center

for Applied Isotope Studies at the University of Georgia, to be radiocarbon dated. "The charcoal sample was treated with 5% HCl at the temperature 80°C for 1 hour, then it was washed and with deionized water on the fiberglass filter and rinsed with diluted NaOH to remove possible contamination by humic acids. After that the sample was treated with diluted HCL again, washed with deionized water and dried at 60°C. For conventional analysis the cleaned charcoal was combusted in Parr bomb under oxygen pressure. The recovered carbon dioxide has been cryogenically purified and converted to benzene on V-Al-Si catalyst. The sample 13C/12C ratios were measured separately using a stable isotope ratio mass spectrometer and expressed as δ13C with respect to PDB, with an error of less than 0.1‰. The activity of the sample has been measured on the liquid scintillation analyzer Packard Tri-carb 1050 and reported as radiocarbon age"(Cherkinsky 2007(Appendix C)).

Dr. James Theler, an Archaeology professor in the Sociology/Archaeology Department at UW-La Crosse, has identified the kinds of animals that are present in features 14 and 29 of the Swenens Upper Garden site, using reference to a comparative collection of faunal specimens. The distribution of the different faunal seasonal indicators will be compared to that of the plant remains to suggest patterns of seasonal occupation of the site. Features may be products of a single season or of multiple seasons of occupation, and such can be documented from the analysis of the plant and animal remains in conjunction with the analysis of the diagnostic ceramics.

DISCUSSION

The Oneota culture can be divided into three phases: Brice Prairie A.D. 1300-1400, Pammel Creek A.D. 1400-1500, and Valley View A.D. 1500-1625 (Boszhardt 1994). Looking at the diagnostic ceramic sherds is the easiest way to distinguish the three phases. The Brice Prairie Phase is determined by shell-tempered ceramics that exhibit inner lip/rim decoration and handles that attach at the lip and high frequencies of Grand Meadow Chert and Hixton silicified sandstone lithic materials (Boszhardt 1994). The Pammel Creek Phase is a transitional phase from the early Brice Prairie Phase to the later Valley View Phase. Pammel Creek ceramics show this transition. The ceramics are characterized by "boldly" impressed finger or tool notching on top of the lip and handles that are attached below the lip. The use of Hixton silicified sandstone and Grand Meadow chert decrease and an increase in poorer-quality local chert and low-grade silicified sandstone during the Pammel Creek Phase (Boszhardt 1994). Valley View ceramics shift to finger or tool lip-top notching, and a handle attached below the lip. The lithic raw material from the Valley View Phase continues with the pattern begun during the Pammel Creek Phase, locally available chert makes up most of the lithic debris assemblage (Boszhardt 1994).

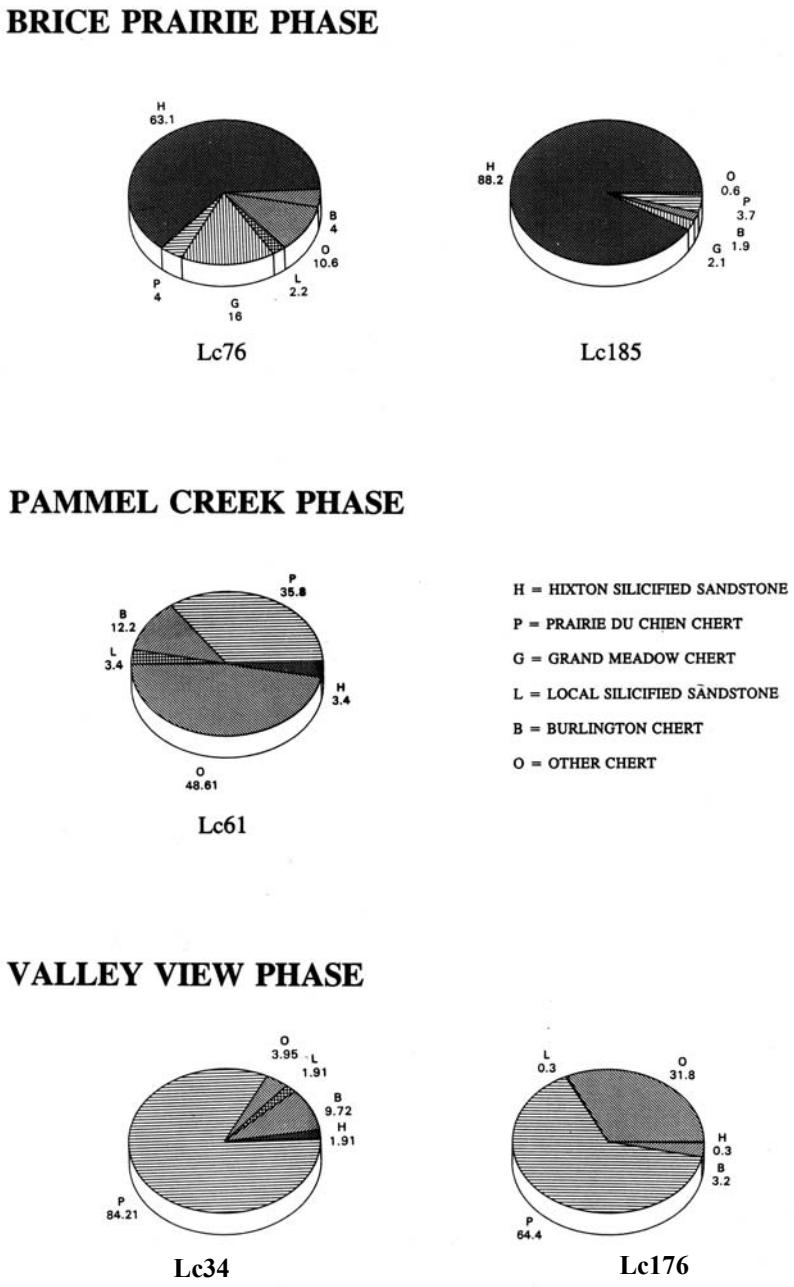

Figure 11. Comparison lithic raw material frequencies at sites representing the three Oneota phases (Boszhardt 1994).

Because the Oneota culture practiced agricultural, corn is almost always present in the charred floral remains of the Oneota archaeological assemblage. Corn would be harvested in August and September and could be stored for winter and spring use (Arzigian et al. 1989). All plants can be stored in pits to preserve them for a time when less food is available, like in winter and early spring, as documented by ethnographic descriptions of such activities (Wilson 1987). Wilson's ethnographic monograph about the Hidatsa woman, Buffalo Bird Woman, describes the process of making a cache/storage pit. A bell shaped pit would be dug in the ground and the walls would be lined with bundles of grasses. Braided corn would be placed next to the grass-lined walls. The middle of the pit would be filled with loose corn, corn off of the cob. In the very center of the pit, a string of squash could be placed. The opening of the pit would be covered with a hide, grass, puncheons, and then soil (Wilson 1987).

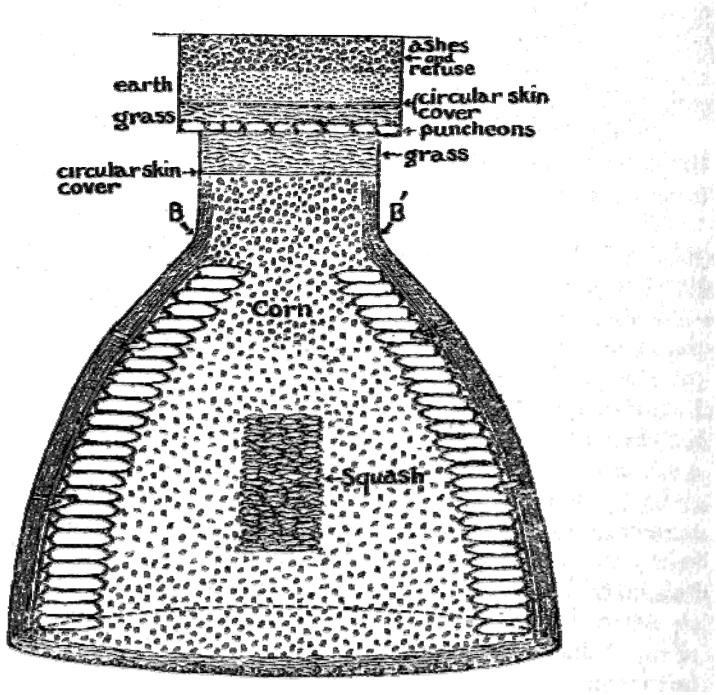

Figure 12. A drawing of a storage pit. (Redrawn form a sketch by Goodbird (Wilson 1987).)

Some summer Oneota villages have a few cold season features. Of the 94 features that were sampled at the Valley View site (47Lc34), three features were interpreted as cold season pits, with another four considered likely making a total of seven (7.4%). These seven features had noticeable absence of warm season resources and a higher density of resources available during the cold season-for example, corn, nuts, and every once in a while dog bones. Three of these features are bell shaped storage pits (Stevenson 1985). There were 37 features that were interpreted as definite warm-season deposits, another 17 probably including fall within this category for a total 54 (57.4%). The organic remains are the same-aquatic resources always present, abundant fish bones and less abundant remains of naiads, muskrat or beaver, and migratory waterfowl. Most of features produced one or a few bones from dogs and large upland and terrace game. Corn and nutshell fragments are almost always present in the floral remains from the Valley View site, but in low densities (Stevenson 1985).

Another site where there is evidence for winter occupation is at the Krause Site (47Lc41). Jonathan Baker's presentation *Oneota Bone Grease Processing at the Krause Site 47Lc41* states that the 2000 summer salvage excavations uncovered three Oneota refuse pits that contained piles of crushed deer and elk bone. The bones were heavily battered and showed evidence of green bone fracturing. The faunal analysis interpreted this as resulting from bone grease production. Dentition found among deer remains, indicates a late-fall early-winter kill (MVAC records.

Dr. James Theler did the animal remains analysis of feature one from the Holley Street site and states that it is made up of the remains of at least three individual lower hooves of two white-tailed deer (Gallagher 1991). All first and second phalanges were broken open, seemingly to extract bone marrow. One or possible two deer sized vertebra are represented by 18 fragments, they also appear to have been pounded to extract bone marrow. Theler believes that these bones represent the remains of bone grease production, a rare phenomenon at Oneota sites in southwestern Wisconsin (Gallagher 1991). Dr. Constance Arzigian contributed to this report with the plant remains analysis of feature one from Holley Street. Hickory nutshell makes up about 90% of the light fraction of 11 liters of soil, with a few fragments of corn kernels and wood charcoal making up the rest. This density of hickory nuts is very high compared to other Oneota features (Gallagher 1991).

RESULTS

Temporal results

The dating results of the two radiocarbon samples returned feature 14 as A.D. 1160±90 and feature 29 at A.D. 1220±130 (Appendix C). There is a larger standard error for feature 29 because the sample was small.

UGAMS#	Sample ID	Radiocarbon δ13C I.D. 13C Corrected (‰)	δ^13 C (‰) Age (YBP±1s)
01883	47Lc333 F.14	790±90	-27.3
01884	47Lc333 F.29	730±130	-24.5

Radiocarbon Analysis Report (Cherkinsky 2007).

Using an online radiocarbon calibration program called CALIB, I was able to calibrate the results of my samples (Stuiver, M and PJ Reimer 2005). The probability distribution of the calibrated dates indicated in Figure 13, shows similar peaks between feature 14 and feature 29 (Appendix D). This implies that the two features were open at similar times and most likely from the same occupation at the site. Calibrated dates from Figure 13 show an average date of A.D. 1260.

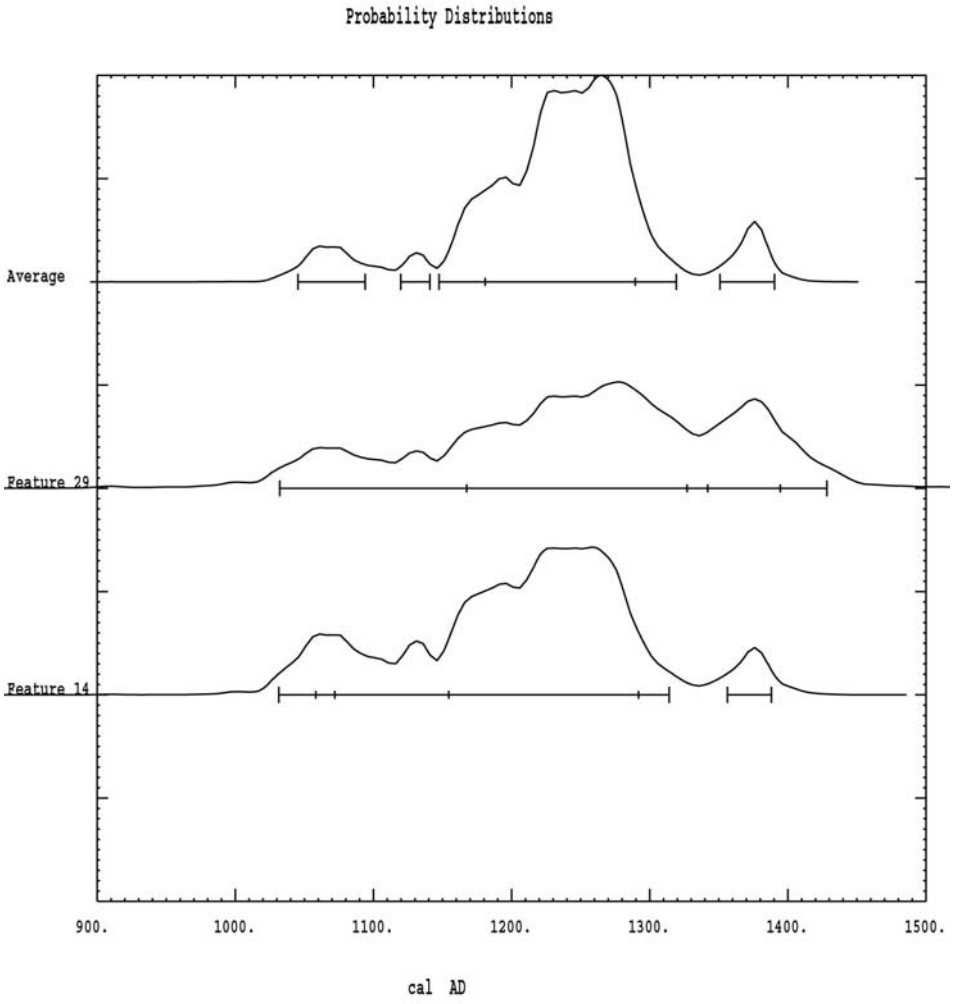

Figure 13. Probability distribution of calibrated dates, including average dates.

An analysis of the diagnostic pottery sherds indicates that all three phases of the Oneota culture are present at the site. While all three phases are represented, the majority of pottery sherds come from the Pammel Creek Phase (A.D. 1400-1500). Out of the thirteen diagnostic ceramic sherds, eleven are from the Pammel Creek Phase (Appendix E). There are four ceramic handles, all of them attach just below the lip. Figure 14 is a vessel sherd (2005.686.11) from feature 14; this picture shows the attachment of the decorated handle below the lip, broad finger notching on top of the lip, and the finger trails along the shoulder of the vessel.

Figure 14. Pammel Creek Phase sherd- Koshkonog Bold.

The raw materials of the tools from the Swennes Upper Garden site indicate that the native people were using a lot of local chert and local silicified sandstone for their tool assemblage. However, there are two tools that are made out of Hixton silicified sandstone. This lithic raw material assemblage is similar to other Pammel Creek Phase Oneota sites.

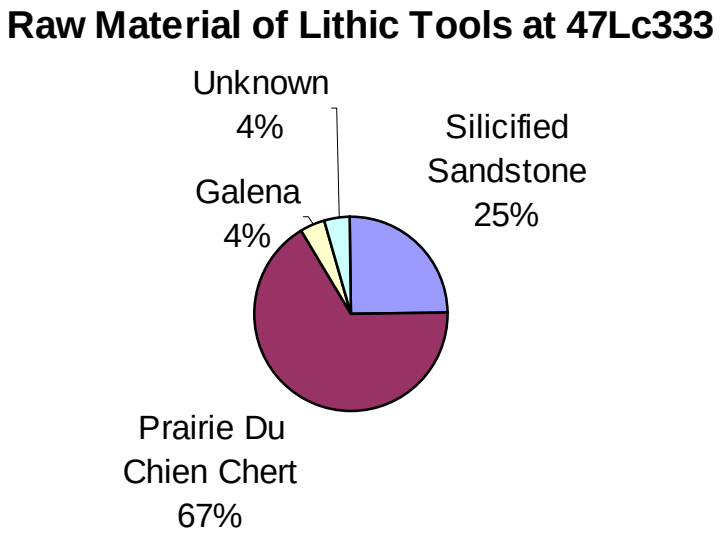

Figure 15. Raw material of lithic tools at 47Lc333.

Seasonal Results

The floral assemblage from the Swennes Upper Garden site was tabulated and compared to the floral assemblage of known summer site, the Pammel Creek site (47Lc61). The Pammel Creek site has a variety of fruit seeds such as cherry, blueberry, blackberry, and nightshade that are typically harvested in late summer. Although these seeds could be dried and stored for winter, or pounded into pemmican, they were probably most commonly

consumed during the season of harvest. In comparison, the Swennes Upper Garden site has very few of these summer resources, Figure 16.

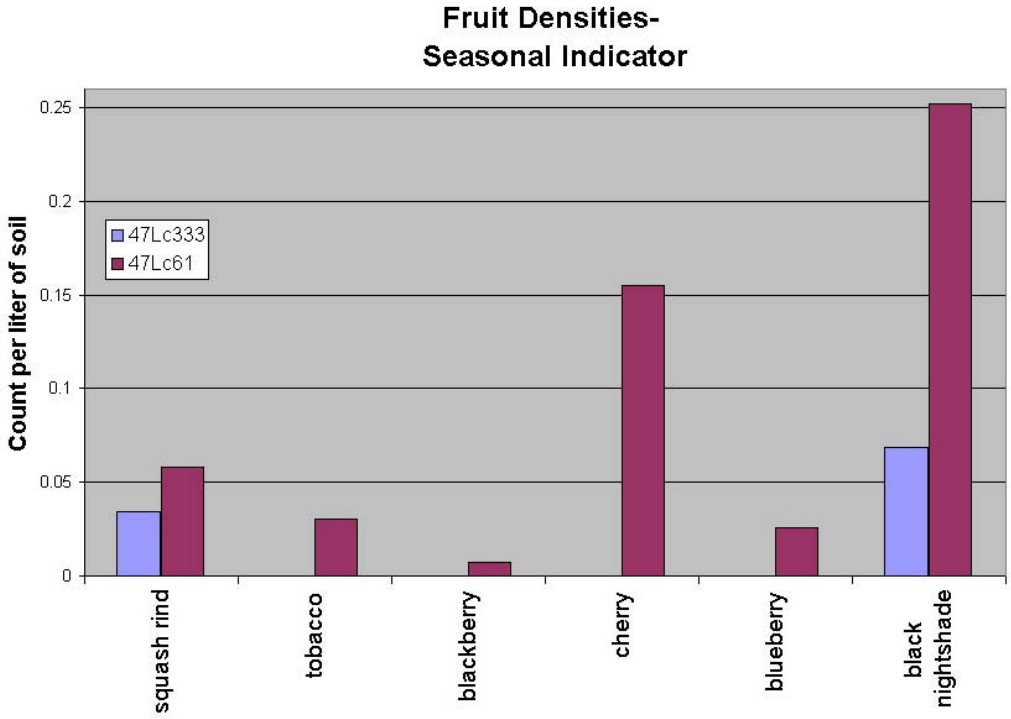

Figure 16. Fruit density table comparing 47Lc333 to 47Lc61.

It is possible that floral assemblages of features may differ from site to site. Not only is the Swennes site lacking summer fruit seeds but also summer weed seeds.

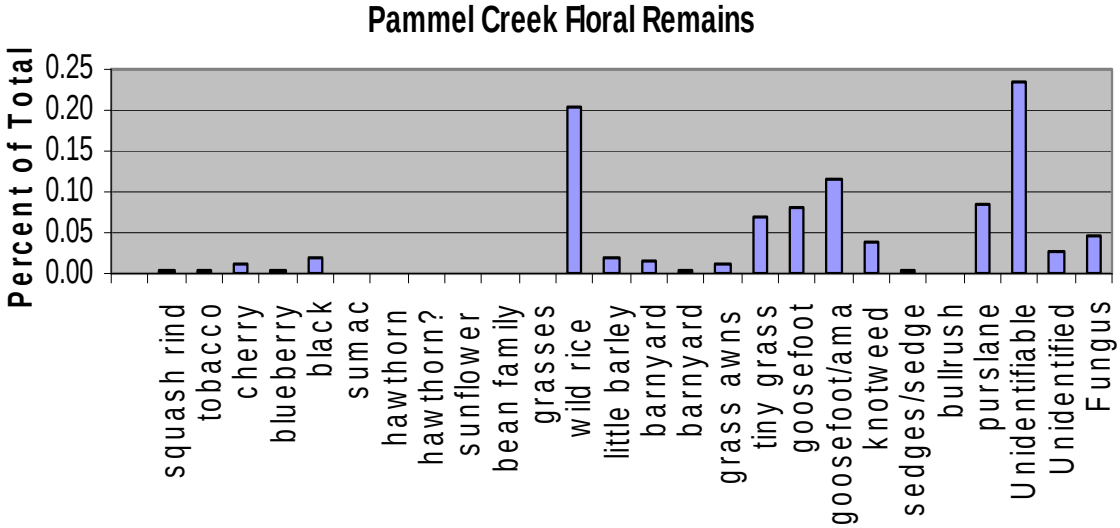

Figure 17. Pammel Creek site floral remains.

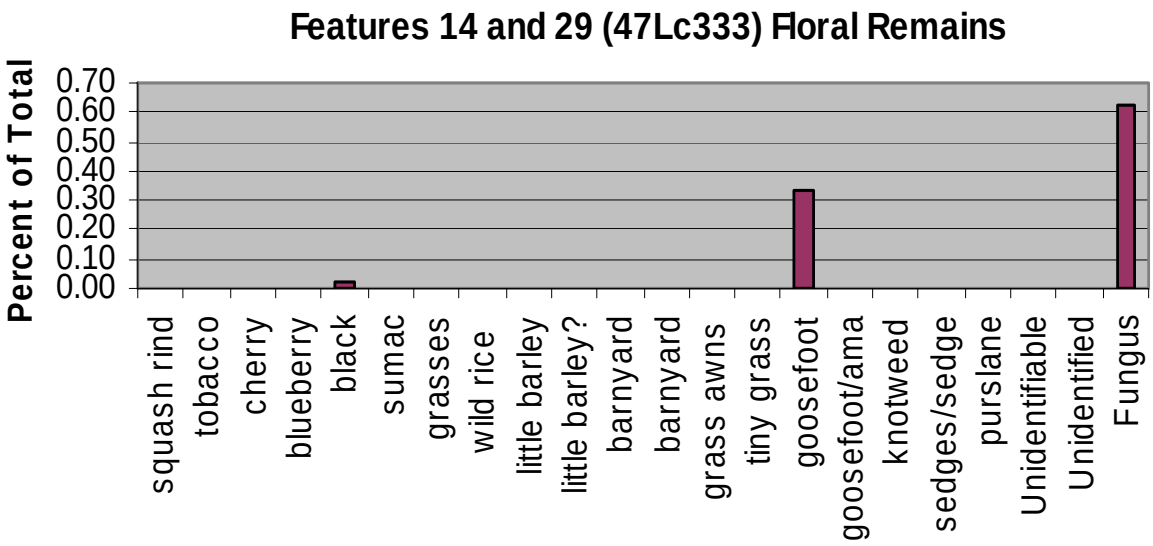

Figure 18. Swennes Upper Garden site Flora remains.

The figures 17 and 18 above show that the Swennes site is lacking typical summer weed seeds compared to Pammel Creek site.

Figure 19 shows that the density of stored plants from the Swennes Upper Garden site is lower than the Pammel Creek site's density of stored plants. A corn cupule is where the corn kernel attaches to the cob, thus the cupules represent waste products. They are more abundant than the corn kernels that would have represented the food remains. The Swennes Upper Garden site features 14 and 29 do not have an abundance of nutshell like the Holley Street site. This, along with the general low density of stored resources, could suggest that during times when food is scarce less would be wasted/burned in the fire.

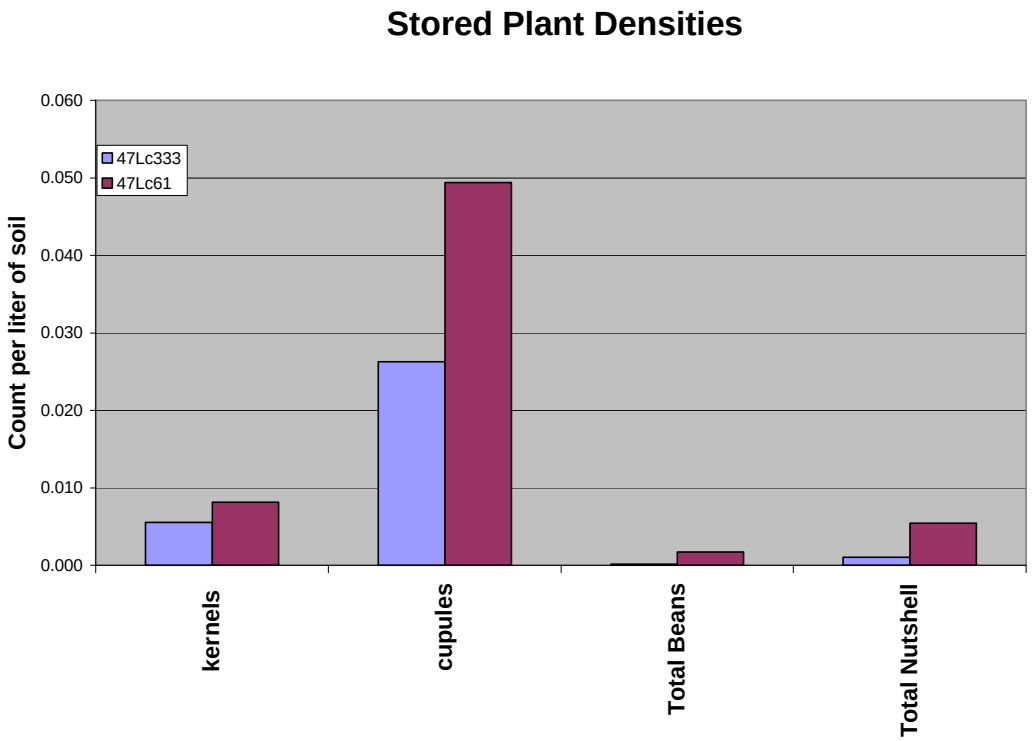

Figure 19. Stored plant densities comparing 47Lc333 to 47Lc61.

The faunal assemblage is made up of an abundance of broken deer bones Figure 20, some which have evidence of green bone fracturing (Appendix F). This assemblage of broken bones suggests bone grease manufacturing. Bone grease manufacturing is a process of breaking the long bones of deer to extract bone marrow. This is a good source of fat, and people would use this resource especially when food is limited.

Figure 20. Abundance of broken deer bone at 47Lc333, this picture is from feature 1.

Along with the evidence of bone grease manufacturing, there are remains of a northern pike with an estimated live weight of 9-10 pounds from feature 29, and a walleye with an estimated live weight of 8 pounds from feature 14. This size of fish would be easiest to catch right after the ice melts from the streams or during spring spawning.

The ratio of scrapers to points, at the Swennes Upper Garden site is 2:1, figure 21. The number of scrapers reflects the emphases on hide preparation of presumably deer compared to hunting at the site (Boszhardt and McCarthy 1999).

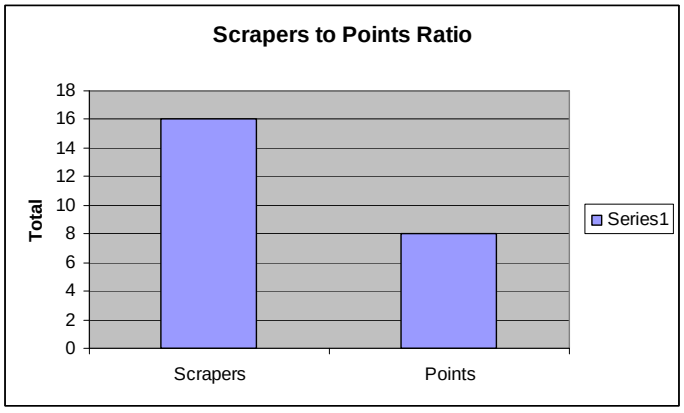

Figure 21. Ratio of scrapers to points at 47Lc333.

CONCLUSION

For this thesis I had two research questions: what was the specific phase(s) of occupation? and what was the seasonality during which the site was occupied? To help me address the first question I looked at the ceramics and lithic raw material from the site and sent two radiocarbon samples to the Center for Applied Isotope Studies at the University of Georgia, to be dated. To address the second question I looked at the floral and faunal remains from 47Lc333. I compared the floral remains with the known summer site, Pammel Creek site and compared the faunal remains with the few features that have been interpreted as cold season features. The dating results of the two radiocarbon samples returned as feature 14 A.D. 1160±90 and feature 29 A.D. 1220±130. The probability distribution of the calibrated dates indicated in Figure 13, shows similar peaks between feature 14 and feature 29. This implies that the two features were open at similar times and most likely from the same occupation of the site. Calibrated dates from the site have an average of A.D. 1260. Indicated by the pottery sherds, all three phases are represented at 47Lc333, but the majority of pottery sherds come from the Pammel Creek Phase (A.D. 1400-1500). The lithic raw material assemblage of the tools at the Swennes site is best comparable to that seen at other sites from the Pammel Creek Phase. Native people primarily utilized local cherts and local silicified sandstone; there are only two tools that are made from Hixton silicified sandstone. This raw material assemblage is a good transition between Brice Prairie Phase and Pammel Creek Phase. The radiocarbon results came back early for the Pammel Creek Phase A.D 1400-1500, which the ceramics and lithic analyses indicate. This early date could show us that the people were using old, possibly dropped, wood for fuel. Wood from older trees would give older dates that the period of actual site use.

The floral assemblage of the Swennes Upper Garden site compared to that of the Pammel Creek site shows an apparent absence of summer resources at the Swennes site such as weed seeds and fruit seeds. Along with the plant remains, the animal remains also suggest a cold season occupation. There is a large abundance of broken deer bones at the Swennes Upper Garden site. There are also remains from a northern pike that had an estimated live weight of 9-10 pounds and a walleye that had an estimated live weight of 8 pounds. This sort of assemblage is normally not seen at the summer sites. The deer bones indicate that there were people around in the late fall and the spring spawning fish indicate that there were around early spring. There are no good indicators for a mid-winter occupation because no plants would be growing and people would live off of stored resources. The broken deer bones and green bone fracturing indicates that the people were pounding open the bone to extract the bone marrow, which suggests that food was limited.

The floral and faunal assemblage is best compared to the few cold season features at other summer sites: Valley View, Krause, and Holley Street sites. These features make up a low percentage of the summer sites, indicating that only a few people stayed at the village during winter. The Swennes Upper Garden site is unlike most sites because it is a smaller occupation. The summer village sites are large and are located in areas where there could be agricultural fields. The Swennes Upper Garden site is not located in the same topographic setting as the larger summer villages, but is placed in a interior valley that might have provided some protection; it doesn't have the large open areas that the summer villages have. Although some winter features are found in larger Oneota summer villages, the Swennes Upper Garden site is one of the few small sites that appears to be primarily a winter occupation.

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