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## ***Variability in Maize Morphology: Examples from Five Central Plains Maize Collections***

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Of all the New World crops encountered at the time of Euroamerican contact, maize, or corn (*Zea mays*) was the most predominant among populations residing from the Florida coast to the deserts of the Southwest, and south from the El Paso River Valley to northern present day Ontario. Given this vast geographical range, which includes extreme differences in temperature, growing days, and precipitation, maize underwent regional adaptations to express genetic and phenotypic variability. This variability is often used to define types of maize, explain the distribution of each type from its projected point of origin, and assume cultural relationships among groups growing the same maize type. Collections of historic maize confirm the validity of archaeological maize types, especially in regions where populations have retained their heritage crops, making it possible to compare archaeological maize to modern samples with a high degree of confidence.

In the central Plains, the ability to define valid maize types, both ethnographically and archaeologically, is compromised by the fact that present day tribes have largely not retained their heritage crops. Unlike other areas of North America, extant varieties or races of native maize from central Plains economies are not available to help us differentiate the presence of different cultivars from the archaeological record. Limited historical records on the maize grown by the Pawnee and Wichita (Table 1) confirm the growing of several varieties, which were used for different purposes, required different growing conditions, had different harvest dates, and were processed or cooked in different ways. However, if we remove the various cultural uses and kernel color, we are left with the morphological characteristics of row number, cob size and shape, kernel size and shape,

and the presence of nubbins as the primary defining components of each type – but these are not necessarily unique for each type. So, in an attempt to recognize the presence of more than one variety of maize in the archaeological record, our best approach is to record those attributes that have been shown to be most useful for distinguishing corn cultivars and look for similarities and differences among archaeological maize samples. The quantitative attributes include maximum cob length, diameter, pith diameter, diameter with kernels, row number, cupule width, and kernel thickness. The significant qualitative characteristics are presence and degree of pairing and cob shape and cross section. Obviously, the more samples examined, the greater the ability to sort out the most significant characteristics associated with temporal or spatial complexes and thus, the greater ability to assess varietal types.

For this paper, I compare the measurements taken on cobs from 5 sites: Lundeen (14MD306), Pratt (14PT1), Tobias (14RC8), Fool Chief's Village (14SH305), and the Pawnee Indian Village (14RP1) (Figure 1). The samples were selected because: 1) they are from significant sites, but the maize measurements are not reported elsewhere; 2) some of the samples were sent to me for analysis, having been recovered from recent investigations or donations; 3) collectively the samples represent cultural complexes ranging in time from ca. A.D. 1350 to 1800; and 4) these samples complement an earlier study (Adair 2004) that identified the presence of three maize varieties from approximately A.D. 1200 to 1800.

A definition of terms and an explanation of potential biases are needed before presenting the maize morphology. Maize comes in 5 phenotypes: sweet, flour, flint, dent, and pop, yet all forms derive

**Table 1**  
**Historical Documentation of Central Plains Maize Varieties**

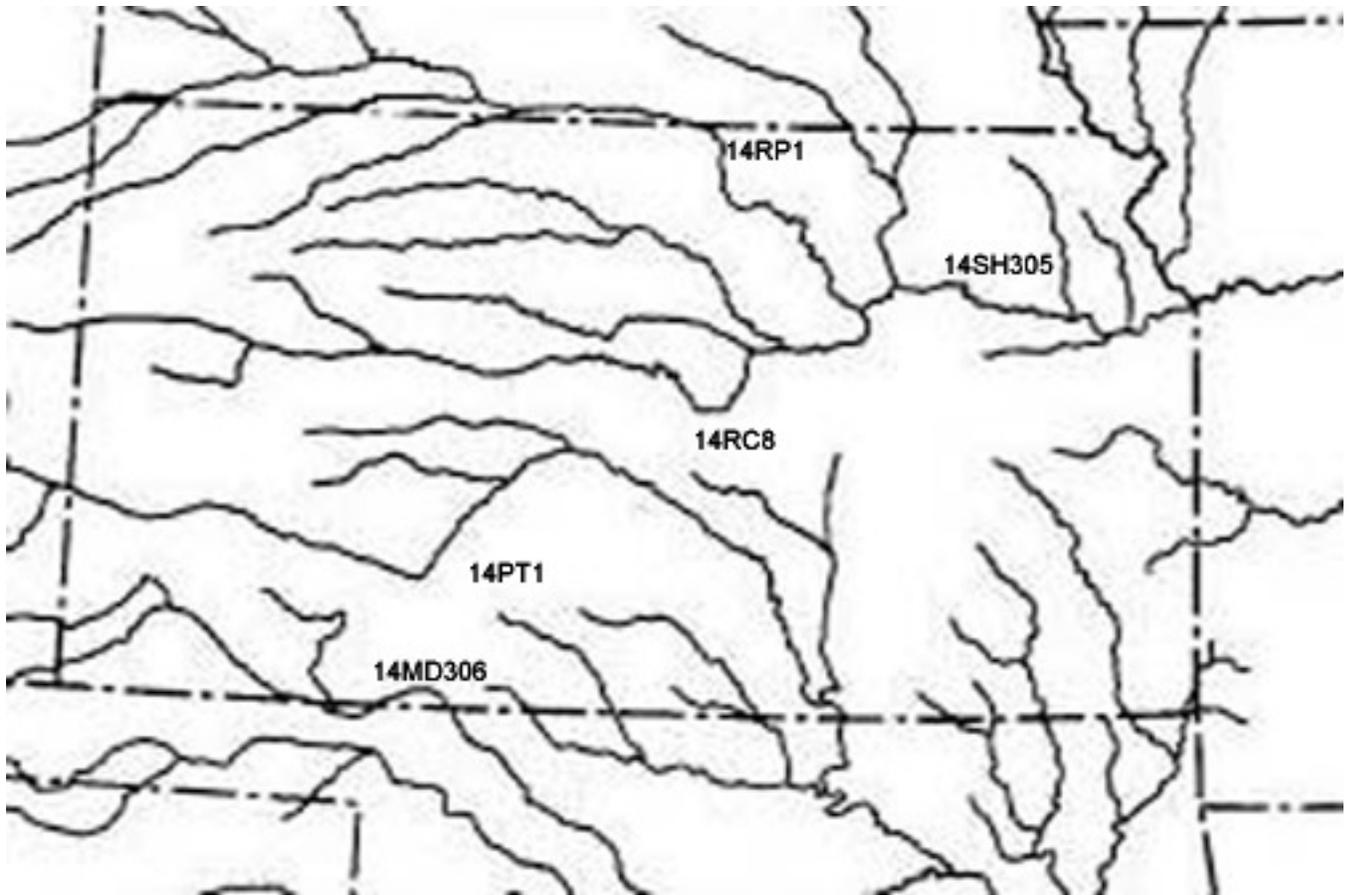
Tribe	Maize type	Row number	Mean cob length (inches)	Cob shape
Pawnee	White flour	8	8-11	slender cob
	Yellow flour	8		long slender cobs
	Yellow flint	10-12	7-8	nubbins
	Red flint	8	7.5	
	Blue flour	8	8-10	nubbins
	Sweet corn	10-16	4-7	nubbins
	White and red flour	8-10	7-8	nubbins
	Blue speckled flour	8	7-10	slender cobs
	Popcorn	12	4	
	Red flour	8	6	slender cobs
Wichita	Yellow flour	8		nubbins
	Black flour	8		nubbins
	Red flour			

Source: Will and Hyde 1964:306-317

from a single ancestor domesticated in central Mexico about seven thousand years ago. Prior to European contact and modern hybridization, these forms adapted to a variety of different climates and cultural selections as they diffused throughout the Americas, eventually producing multiple types of each form. Depending on regional circumstances and the extent of selections, not all types look exactly the same. For example, while the flint kernel may retain its hard flinty exterior, the cob size, shape, and row number can vary. Even for varieties considered more pure, the highly genetic diversity of maize can produce such characteristics as 12-rowed cobs on an otherwise predominately 8-rowed type.

Maize types frequently mentioned in the literature associated with Plains cultures are Chapalote, North American Pop, Midwest Twelve Row, and Eastern Eight Row. Chapalote is viewed as one of the earliest North American varieties and produces short, slender cigar-shaped cobs on small

shanks. The flint or pop kernels are deeper than wide and are borne in deep, narrow, open cupules about 3 to 5 mm wide. Cutler and Blake (1976) identify North American Pop as a descendant of Chapalote, a variety that produces 12-rowed cobs. A modified form of North American Pop that is similar to the historic Pima-Papago corn was termed by Cutler and Blake (1976) as Midwest Twelve Row. Dominant in central and southern archaeological sites, this type produces kernels that are deeper than wide and borne on 10 or 12-rowed cobs. Cutler and Blake (1976:6) note that by A.D. 1500, this type “had largely disappeared but left its mark in the common 10- and 12-rowed varieties of Eastern Eight Row which are grown in the Plains area, especially towards the south.” An unnamed type (Blake 1986) that appears in the Southeast is a modified form of Eastern Eight Row that produces kernels that are wider than deep. Eastern Eight Row (or Maiz de Ocho) can produce 8-, 10-, or 12-rowed cobs. These cobs are generally slender



*Figure 1. The Distribution of the Five Sites Used in This Study*

and taper-shaped and hold kernels that are wider than deep and often crescent-shaped. This shape is enhanced by the fact that the embryo is usually absent in archaeological samples. A well-known variety, Northern Flint, is a descendent of Eastern Eight Row.

Various scholars have traced the introduction and diffusion of cob types in the greater Southwest and eastern North America through time, areas that independently developed agriculture and independently received maize from Mexico. By comparison, few scholars have focused on maize varieties of the Great Plains, instead defining Plains maize as variations of types recovered from sites in adjacent regions. Even Cutler and Blake tended to define Plains varieties or types from very few sites, especially cobs recovered from central or southern Plains sites. Attempts to define archaeological maize types in

regions outside of the greater Southwest is compromised in large part by the fact that many types, including North American Pop, Midwest Twelve Row and some of the earliest dent maize, are very poorly defined in the literature. In addition, as more direct dates on maize become available, the earliest maize is not indisputably a high row number cigar-shaped small cob type, as once believed. In fact, the sample from the Trowbridge site (14WY1), identified as Chapalote and believed to represent the earliest maize in the central Plains, was direct dated to ca. A.D. 1720 (Adair 2006). For these reasons, and combined with the lack of extant Plains varieties, I suggested (Adair 1994:332-333) that it is not warranted to refer to Plains corn by a type distinguished in other regions, where measurements on high quantities of cobs confirm the presence of a named type. Equally misleading is the notion that Plains corn was

evolving towards 8-rowed dominance, suggesting that cobs with 8 rows are associated with later occupations or that 8-rowed cobs imply a more robust agricultural practice with higher yields. When I made this suggestion in 1994, it was based on measurements recorded on maize from a total of 27 central Plains sites ranging in age from Woodland to late prehistoric and was dominated by measurements taken on isolated kernels and cupules. Since then, larger maize samples, including complete to near complete cobs and caches of seed corn, have been analyzed from many more sites. Direct dates on several samples have helped tighten the temporal range of various characteristics and all measurements have been entered into a database, making comparisons at several levels possible.

Four years ago (Adair 2004), I used statistical measures (means, standard deviations, k-means clusters, and chi-square) to compare maize characteristics among 38 sites, with the goal of using morphological attributes to define types. For each sample, I recorded the quantitative attributes of row number, cob and pith diameters, cupule width, cupule length, and kernel thickness. These features are shown to be among the most useful for distinguishing maize cultivars from the eastern United States (King 1987). I also recorded the qualitative characteristics of cob shape and size, and presence or absence of row pairing. Results of the basic statistics (means and standard deviations) showed a trend in the decrease in row number through time and a corresponding increase in mean cupule width and cob diameter. Essentially, the cobs were getting bigger. There was also an increase in the presence of cobs with different row numbers during the Great Bend period, with 10- and 12-rowed cobs account for about 68% of the total, and an additional 10% of the sample containing 14- and 16-rowed varieties. Given this variation in row number, there was a corresponding higher variation in the maximum diameter and pith diameter. However, while these basic statistics explained variability in a temporal order, they overlooked the potential for similar varieties to be consistently or

sporadically represented during one or more cultural periods. In addition, since maize types are distinguished by a combination of traits, I used a cluster analysis to sort the cobs into groups with similar characteristics. The premise for this approach was the assumption that cobs from one maize type would be more similar to one another than they would to another type. The cluster analysis arranged the quantitative data from all of the maize into three types with the following characteristics:

- Maize cobs in the first cluster, represented by 55 samples, were characterized as having a mean row number of 9.6, cupule width of 9.5mm, and kernel thickness of 3.5mm. The mean cob diameter is almost 16 mm, and pith diameter is 7.3mm. Twenty-five percent of cluster 1 samples come from the eastern portion of the central Plains along the Missouri River trench, 58% are from the eastern to central portion of the central Plains and 16% are from the western plains. Sites from all periods are represented and included maize from sites 14MD306, 14RC8, Lynch (25BD1), Ponca Fort (25KX1), 25CH1, 25DN1, and 14RP1.
- Sixty-five cobs fell within the second cluster and are characterized as thinner cobs (mean diameter of 11.6mm) with smaller cupules (6.9mm in width and 3.1mm in kernel thickness). Row number is fairly similar to cluster 1, averaging 9.9. Cobs within this cluster have been recovered mainly from sites located in the western region and include samples recovered from 14MD306, 25DN1, and 25CH1.
- The third cluster is represented by the fewest specimens, but includes the largest cobs. The mean row number is over 10, cob diameter is 20.6mm, and pith diameter is 8.8mm. Cupule width is 11.4 mm and kernel thickness is 3.9 mm. All of the cobs in this cluster come from the protohistoric or historic period, and all were recovered

from sites located in either the eastern or central part of the study area.

Only time and additional samples will determine the validity of these three types. Based on the historic record, both the Pawnee and the Wichita possessed more than three maize types; types defined in part on color, harvest dates, and size. My research uses only measurable characteristics, making it hard to compare the cluster data to the historic record. My research is further challenged by the sample sizes recovered from excavations. Cobs recovered from one feature, such as a cache pit, may represent a single harvest or storage event and may therefore show a high degree of similarity, masking the presence of any other cob types from the site. The possibility also exists that portions of the same cob could be represented in any collection recovered from a single feature. The historic record also documents the common practice of Plains groups shelling corn close to the fields, a task that would have restricted cobs from being present in or around the lodge. The density of cobs also makes them a great source of fuel for the fire, again perhaps signaling a specific event involving select cobs. And finally, in any comparison, not all attributes can be measured on all samples, as the quantity and completeness of cobs and cob fragments vary considerably among the samples recovered from various sites. However, additional and sizeable maize samples from various contexts over time and space will enhance our ability to distinguish meaningful archaeological maize types, even if these constructed maize types do not allow us to apply an historic name to what we have recovered. Therefore, when new maize samples become available (through new excavations or by an awareness of a curated collection), I see an opportunity to refine our understanding of how Plains groups managed this critical resource.

The five samples presented here come from very different contexts. The Lundeen site,

14MD305, is assigned to the Odessa phase of southwest Kansas and northwest Oklahoma (Brosowske and Bevitt 2006), a phase with strong similarities to the Antelope Creek and Buried City complexes of the Texas and Oklahoma panhandle regions. Maize from this site was randomly selected from the curated assemblage, with efforts to measure the largest cobs from several features.



*Figure 2. Selected Cobs from 14RP1*

Perhaps of similar age is the maize sample from the Pratt site, 14PT1. This interesting sample was excavated by local amateurs in the mid-1960s and was recently donated to Wichita State University. The sample is simply recorded as being recovered from a pit. The Little River focus of the Great Bend aspect is represented in this study by a sample from the Tobias site, 14RC8. The next two samples come from early historic sites: 14RP1, the Kansas Monument Site, is the location of a Pawnee village in the Republican River Valley occupied in the late 1700s to early 1800s. The sample reported here is

**Table 2**  
**Comparisons of Maize Characteristics from Five Sites**

	<b>14MD306</b>	<b>14PT1</b>	<b>14RC8</b>	<b>14RP1</b>	<b>14SH305</b>
Cob Sample	32	20	33	49	15
Row Number					
Percentage	8	9	15	35	55
	10	38	80	18	37
	12	50	5	33	8
	14	3		14	
Mean Cob Diameter	12.2	9.5	14.5	16.5	14.9
sd	2.4	1.7	4.3	1.3	2.9
Mean Pit Diameter	4.9	4.9	5.8	6.5	7.5
sd	1.5	0.8	2.2	1.4	1.1
Cupule Width	7	6.9	7.9	10.6	8.9
sd	1.5	0.8	2	1.4	1.5
Cupule Length	2	3.7	2.9	4	4.1
sd	0.6	0.3	0.5	0.5	0.4
Kernel thickness	3.3	3.4		4.5	
sd	0.6	0.4		0.4	

not the total amount recovered by investigations in 1949 (Carlyle S. Smith) and the 1960s (Tom Witty), but a somewhat random attempt to select large cob sections from several lodges (Figure 2). The final sample was recovered from a single feature at Fool Chief's Village (14SH305), a Kansa lodge.

Some basic observations of these data (Table 2) confirm several trends identified in the cluster analysis. First, while 8-rowed maize is present in higher percentages in the late prehistoric/historic period, it does not dominate the assemblage. Instead 10- and 12-rowed varieties, and 14-rowed varieties from the Tobias site, are represented by significant amounts. Second, cob size increases somewhat, although the standard

deviations suggest a significant level of variability, perhaps a reflection of different varieties. The same trends are true of pith diameter and cupule width. However, these observations are made from the mean measurements, which have already argued to essentially collapse the observance of more than one type. While the basic observations are interesting, the morphological data from these five maize samples are better evaluated by the application of higher-level statistics. At this point however, this application should wait until additional samples are studied. For example, all of the maize cobs from the Lundeen and Kansas Monument sites should be measured, rather than the prior random selection for the largest cobs. Additional maize collections from other sites,

curated at several institutions, could also provide data from new geographical or temporal periods of the central Plains. The anticipation of adding additional collections to this analysis in the near future will not only enhance the database, but the results will help support the suggestion that three maize types existed in the central Plains between ca A.D. 1200 and 1800. The cluster analysis also suggested that geography, rather than time, played a more prominent role in distinguishing the maize types; a suggestion that may be better evaluated with well-documented regionally specific maize populations.

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## *The Kohr Site (14SA414) House 1 Pottery Assemblage Revisited*

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In a 2001 article in *The Kansas Anthropologist*, I described the results of Guy, Mabel, and Jay Dee Whiteford's excavation of House 1 at the Kohr site, 14SA414 (Roper 2001:93-113). The article described all materials from that house in the Whiteford Collection at the Kansas State Historical Society (KSHS). As I noted, however, it was clear that the collection did not (and does not) contain all the materials, particularly the pottery, that the Whitefords' own collection catalog listed for this house or that Waldo Wedel described as having come from this house when he reviewed the collection in June 1940. Some, although still not all, of the missing pottery now has come to light in other locations and is here described. As I will show, it is not just more of what remains in the Whiteford Collection at the KSHS, but rather a coherent subset of the pottery from this lodge, complementing and by no means duplicating the pottery already described. As such, it adds considerable information about the ceramic assemblage from this house. It also helps us better understand the range of variation of the pottery from this locality.

### **The Site**

The Kohr site, 14SA414, is the Smoky Hill phase habitation site surrounding and, in a real sense, encompassing the communal cemetery designated the Whiteford site, or Indian Burial Pit, 14SA1. It lies on the front edge of the broad terrace on the north side of the Smoky Hill River, less than a mile upstream from the confluence of the Saline River with the Smoky Hill River (Figure 1). It is a large site, with dispersed lodge remains estimated to number "[N]o less than twelve" (Whiteford 1941:18) and "12 or 15" (Wedel 1959:513). The site limits are arbitrary and probably correspond to modern property lines. In actuality, additional lodges subsumed under different site numbers are

not necessarily farther from the Kohr site houses than are the Kohr site houses from one another—Richard Stauffer, who was familiar with the site from the 1950s, in fact bounded the site differently than did the Whitefords and other investigators (compare site forms in the state site files; this is further discussed in Roper 2006a). Unfortunately, all lodge remains now are obliterated by plowing and have been for some decades. Thus, although small amounts of work were done at the site by Tom Witty, Harold Reed, Richard Stauffer, and perhaps others, much of what we know, and will ever know, about the site is the result of work conducted in the 1930s by the Whitefords.

House 1 is the first and better of two Kohr site houses the Whitefords excavated. They performed the House 1 excavation in summer 1936, exposing the floor and associated features of a slightly sub-rectangular structure, 32 feet (north-south) long by 30 feet (east-west) wide, with an ill-defined, but probably east-facing, entryway. The house had the usual central hearth, and five cache pits. The artifacts and organic remains collected included the usual pottery, projectile points, bifaces, endscrapers, groundstone objects including four large metates, bone tools, shell hoes and beads, a shell pendant, a small quantity of unmodified animal bone, and some corn kernels. The Whitefords cataloged this material, and much—but not quite all—of it remains in the collection at the KSHS (Roper 2001:100). A single AMS radiocarbon age determination recently run on corn is  $820 \pm 40$  rcybp (Beta-178238), which calibrates to a one-sigma range of A.D. 1187–1199 (probability [p] of this being the true age of the sample = .100) and 1206–1261 ( $p = .583$ ), and a two-sigma range of A.D. 1058–1072 ( $p = .012$ ) and 1155–1277 ( $p = .942$ ) (Roper and Reed 2003:62; since reporting this age determination there, I have recalibrated the date and probabilities using Calib

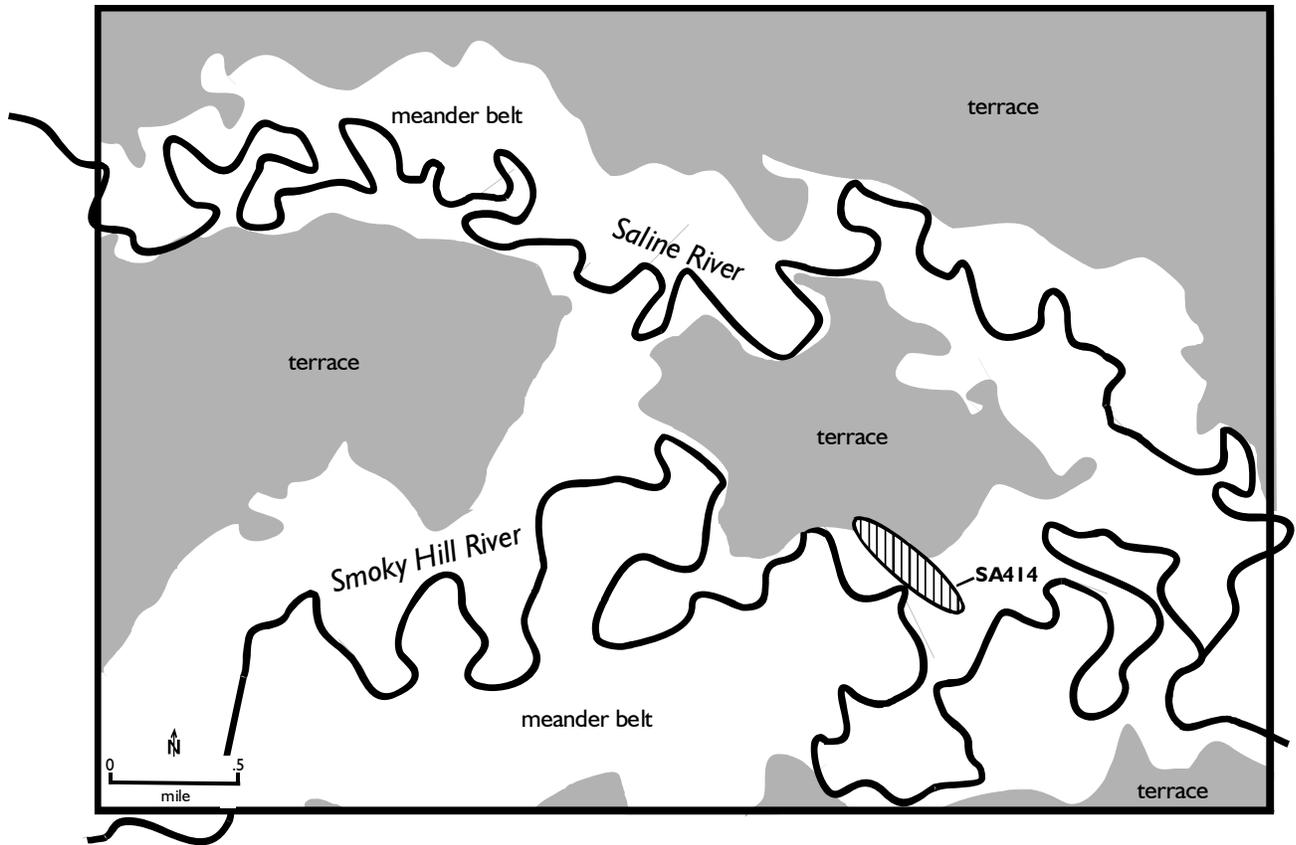


Figure 1. The General Location of the Kohr Site, 14SA414

5.0.1, the most recent version of this calibration program).

**The Ceramic Assemblage as Understood from the Records**

The Whitefords briefly described their Kohr House 1 excavation in two booklets (Whiteford 1937:3–10; 1941:11–18).<sup>1</sup> Each showed a photographic mosaic of artifacts from the lodge. This mosaic shows three restored pots and probably nine rim sherds (Whiteford 1937:6; 1941:15). If each rim sherd represented a separate vessel, then the assemblage contained sherds from at least twelve vessels. The Whitefords’ artifact catalog for this lodge lists eleven “pottery rims, “one “large pot” from the floor, and one object listed simply as “pottery” from a cache. This latter

probably is the “one half a piece [vessel?] of pottery” said to have come from Cache 5 (Whiteford 1937:7; 1941:18). The total from the catalog, therefore, seems to imply at least thirteen vessels, excluding the possibility of refits among rim sherds. Waldo Wedel reviewed the Whitefords’ Kohr site collection in 1940. In his notes, he described three restored pots. These undoubtedly are the three restored pots in the photo mosaic. He also listed fragments of four large pots, and twelve rims. Wedel’s notes describe three of the four large and presumably unassembled pots, noting for the fourth that it was “sent to Mr. [A.T.] Hill for possible restoration.” Whether Hill ever restored that pot or whether he ever returned it to the Whitefords is undocumented. Wedel’s notes also suggest the other twelve rim sherds represent twelve different vessels (untitled notebook, Box

110, Wedel Papers, National Anthropological Archives, Smithsonian Institution, Washington, D.C.). Confirming the likelihood that Wedel was not including the four large pots in the twelve rims total, he later reported that the ceramic assemblage included “three whole, or nearly whole and thus restorable vessels, considerable fragments of four other large vessels, and approximately 160 body and 12 rim sherds” (Wedel 1959:514). The obvious implication here is that at least nineteen vessels are represented in the House 1 ceramic assemblage.<sup>2</sup>

The Whiteford collection from Kohr House 1 at the KSHS currently contains no restored vessels and seven rim sherds, none of which seem to be the “fragments of four other large vessels.” The seven rim sherds can be identified (from their overall shape) as seven of the nine rim sherds shown in the photo mosaic of objects from the lodge excavation. These are the rims described in my 2001 article (Roper 2001:100–103). The question is, and always has been, what happened to the rest of the pottery. The recent discoveries in other collections now account for four of these seven vessels, including one of the three restored pots and three of the four other large vessels.

### **The Restored Pot**

The Indian Burial Pit building housed the excavated cemetery and also had display cases with objects from the cemetery and from other sites.



*Figure 2. The Restored Pot*

These included at least one of the restored pots from Kohr House 1. Because it was not from the cemetery, it was not considered part of the purchase when the state bought the burial pit at the end of 1989, and the landowner retained this vessel. Harold Reed discovered this fact in October 2002. He borrowed the pot at that time and then notified me that he had it. He invited me to examine it and I did so on October 30, 2002. My photograph of this pot (Figure 2) subsequently appeared in a review of Smoky Hill phase culture in my study of the Whiteford site (Roper 2006b:32). Waldo Wedel (1959:Pl. 88a) had earlier illustrated this vessel, apparently using a photograph the Whitefords sent to him. I also used some of the descriptive data in a comparison of cemetery vs. habitation site vessel

sizes in that same study (Roper 2006b:194–195). I have not otherwise described this vessel.

The Whitefords recovered much of this pot, permitting them to undertake a reconstruction that accurately reflects the vessel's original size and shape. The pot is about 27 cm high and 31 cm in maximum width, at the shoulder. The body is overall globular, with a well-rounded base and a high and well-rounded shoulder. The neck is about 15½ cm in diameter and tightly curved. The rim also is short, but in spite of this and because the shoulder is high and curve of the neck so tight, it appears to flare outward quite dramatically. The rim is asymmetrical, varying in height from 16.5 to 19.9 mm, which is only about 6.1 to 7.4 percent of the total vessel height. The orifice diameter is about 19 cm. The entire vessel exterior is cord-roughened to the lip. The cord-roughening is partially, but not systematically, smoothed. Rim and shoulder decoration is absent. The lip is smoothed and exhibits left-to-right incised decoration.

### The Three Unassembled Large Pots

The Whitefords left Kansas at the end of 1946 under circumstances described elsewhere (Roper 2003). At that time, they apparently either

took with them or stored most of their collection. They donated the collection to the KSHS in 1971. The collection at the KSHS does not contain quite everything they recovered, from Kohr House 1, or other sites. While I have no way of knowing all of what may have been given to other institutions or persons before the KSHS donation, we do know that, through Albert Spaulding on October 19, 1946, the Whitefords donated a small amount of material to the University of Kansas. Most of this donation was the material from one of the Great Bend aspect cache pits they had excavated at the Paint Creek site (14MP1). The donation, however, also included what the accession ledger describes for catalog number 10935 as a “mass of sherds representing two Upper Republican pots” from “Saline County, Kansas. One rim sherd marked S1-H1-21.” S1 is the Whitefords' number for the Kohr site, H1 is House 1 at that site, and 21 is the Kohr House 1 catalog number for rim sherds. The Smoky Hill phase had not been defined yet and material now subsumed within that taxon was routinely called Upper Republican (Blakeslee 2002:163–171). The number of pots represented by rims actually is three. Their descriptions and such measurements as can be made match those Wedel

recorded for the three large pots that he saw and described in 1940. The donation from this site also includes a large number of body sherds that presumably were parts of the same pots.

The first pot is represented by at least thirteen large sherds, six of which are conjoined to reconstruct a large section of the rim and shoulder of a large jar (Figure 3). The



*Figure 3. The First Unassembled Vessel Rim*



Figure 4. The Second Unassembled Vessel Rim



Figure 5. The Second Unassembled Vessel Shoulder

upper body portion represented by the reconstructed section, and by a second large single sherd that is from the upper part of the vessel but lacks the upper part of the rim, suggests the pot was overall globular. The appearance of sherds that probably are from the lower part of the body are consistent with this. The vessel shoulder is gradual and very well-rounded. In contrast to the short and abrupt outcurved neck

of the reconstructed pot, the neck of this unassembled vessel forms a long, gentle curve. The actual rim, though, is short, measuring just over 20 mm high. It is direct and slightly outward flaring. The lip is rounded. The exterior surface of the vessel body is cord-roughened to the neck. The neck, rim, and lip surfaces are smooth. Neither the lip nor the rim is decorated.

The second pot is represented by three rim sherds that do not conjoin (Figure 4), and at least ten body sherds, a few of which are conjoined to rim sections. One of the non-conjoined body sherds is a large section of

the vessel body that includes the shoulder (Figure 5). As with the other vessels, this one appears to have a basically globular body, although, judging



*Figure 6. The Third Unassembled Vessel Rim*

### **The Rest of the Pottery**

While we know the current whereabouts of only one of the three reconstructed vessels, we do have photographs of all three vessels and can describe them from the photograph. Since the height of the one vessel is known from direct measurement, it is

possible to take measurements of the other two vessels from the photographs and calculate approximate dimensions.

from the large body section, possibly with a somewhat sub-globular lower body. The shoulder is well-rounded. The neck is rather abrupt. The rim measures about 23 mm high and is directly and slightly flared. The lip is rounded. With the exception of the smoothed neck, the entire exterior surface, including the rim, is cord-roughened. The lip is smooth. Neither the lip nor the rim is decorated.

One of the other two reconstructed vessels (Wedel 1959:Pl. 87b) is a large Smoky Hill phase jar. It is about 31 cm high and 40 cm wide. The body is slightly sub-globular. The base, however, is well-rounded, as is the shoulder. The neck is, by definition, constricted, but not highly so. Neck diameter is approximately 30 cm, while orifice diameter is about 31 cm. The rim is direct and flared outward. It appears to be about 5 cm or so high. The vessel body is cord-roughened to the lip. It is impossible to reliably evaluate whether or not the lip is decorated, but the rim is not decorated.

The third vessel is represented by a large rim-shoulder-upper body section (Figure 6). A second rim sherd, broken at the neck, likely also was a part of this vessel. Additional large sherds, some of them conjoined, probably represent portions of the body of this pot. This is another overall globular vessel with a well-rounded shoulder. The neck is fairly abrupt. The rim is about 36 mm high. It is direct and outward flaring. The lip is rounded. The vessel body is cord-roughened through the neck. The rim and lip are smoothed, albeit poorly and incompletely in the case of the rim. Neither the lip nor the rim is decorated.

The other reconstructed vessel (Wedel 1959:Pl. 88b) also is a large jar. It is estimated by measuring from the photograph to be almost 34 cm tall and just under 35 cm in maximum width. Its body is slightly subglobular with a well-rounded base and shoulder so well-rounded as to be almost indistinct. The neck is very short. Neck diameter is about 21 cm. The 28 mm high rim is vertical and appears to have a thin collar. Orifice diameter is about 21 cm. The vessel body is cord-roughened

to the lip. It is impossible to determine if the lip is decorated, but clear that the collar is not decorated.

The vessels represented by the seven rim sherds in the collection at the KSHS (accession # 71.138) also can be at least partially described. The largest and most complete of these (catalog #1987) is a small globular jar with a loop handle. An extrapolation of the vessel height suggests it probably was around 11 cm, with a maximum width of probably about 9 or 10 cm. The body is globular to slightly subglobular, with a well-rounded, indistinct shoulder. The rim is about 11 mm high, direct, and outward flaring. The vessel is thin. Its entire exterior surface is smooth, as is the lip. The lip exhibits left-right incised decoration; the rim is undecorated.

A second vessel (catalog #1988) is an even smaller globular jar, this one probably no more than 6 or so cm tall. It also has a direct, outflaring rim, which in this case is only about 6 mm high. A loop handle is attached near the shoulder and at the lip. The exterior is smoothed. No decoration appears on either the lip or the rim.

A third vessel (catalog #1680) is essentially a small pinch pot that probably was about 5 or 6 cm high. Its profile is irregular, and it has only a hint of a neck and distinct rim about 12 mm high. Its surface is smooth (or at least its not cord-roughened—actually its pretty lumpy, but that is not a surface treatment) and it is entirely undecorated.

Three other rim sherds (catalog #2172, 2173, 1679) are broken at or just below the vessel neck. Each is collared. One of these collared sherds seems to be from a reasonably large jar. The base of the collar is pinched. The second and third rims also probably are from jars. In neither case is the size well indicated, except that these pots were not small. One of these rim sherds exhibits pinching at the base of the collar; the other is entirely undecorated.

The final rim (catalog #1675) is small and it is difficult to tell anything about the vessel it is from. It has very prominent and poorly executed

pinching on the exterior, immediately below the lip.

### Implications

The vessel assemblage from Kohr House 1, while still not quite completely accounted for, at least appears from what we have (and that now is a majority of the material, particularly if we work with the photographs of the two still-missing restored pots) to be dichotomous: it contains moderately large to large cord-roughened jars, as we would expect, but it also contains small vessels, some of which exhibit casual workmanship at best. These latter are not extensively described in Central Plains tradition assemblages. It is becoming clear to me, however, that small vessels—both well-made and poorly-made—were considerably more common than published descriptions would suggest. It would not surprise me to learn that biased collection in past decades was implicated—most of these small pots are not attractive, they sometimes are practically amorphous, and they really are not useful for the typological and chronological analyses that were so beloved of many analysts in earlier times.

But these small vessels are as much a part of the assemblage as are the larger jars. They served some function, and must be accounted for. In an earlier consideration of vessels like these in the assemblage from an Upper Republican phase house in the Medicine Creek valley of Nebraska, I suggested that they may have been serving vessels (Roper 1996). I still think so. This may also be true for the better made, but still small, vessels in the Kohr House 1 assemblage. Examples of somewhat poorly-made small vessels also appear in the assemblage from the LeBeau site (14NT301) on Prairie Dog Creek in Norton County. Closer to the Kohr site—indeed, very close to the Kohr site—I also noted that one of the outstanding characteristics of the pottery in the Whiteford site cemetery was that vessels are small compared to a sample of vessels from lodge sites (Roper 2006b:194-195). The lodge site sample used in that comparison certainly was opportunistically drawn.

While the lodge sample showed almost no size overlap with the pots from cemetery context, the point there was not at all to suggest that small pots did not occur in domestic context, but rather to show that large or even medium-sized pots did not occur in mortuary context. That observation remains valid. The cemetery pots I too suggested were serving vessels, used to involve the dead in ritual feasts (Roper 2006b:325). As I noted, studies of vessel form in the Southeast also find small vessels in mortuary context and have suggested that these were used to serve food to the dead (Hally 1986:287). Thus, no one really has suggested that these vessels are a special mortuary ware, and I did not suggest that for the Whiteford site pottery. In fact, a closer look at the photographs of Whiteford site pots suggests that some of these vessels may not have been particularly well made. In this regard, they are similar to some small and, for their size, heavy and casually made vessels in the Schultz Collection at KU from Smoky Hill phase sites to the northeast of the Salina area. In practical terms, the small pots probably served the same function in domestic and mortuary context, viz., serving food. The only practical difference (certainly there was plenty of symbolic difference) was the vital signs of the food's recipient.

Nor are all of the larger vessels alike. By this, I do not necessarily mean in terms of rim form and presence/absence of decoration. Instead, I mean this in a functional/use sense too. In a formal sense, these vessels are jars, as that term is commonly used. One of their features is a restriction—a neck—in the upper portion of the vessel, above which rises a distinct rim. The degree of restriction, however, varies notably across the spectrum of Central Plains tradition pottery. Just within the small collection of measurable vessels from Kohr House 1, the proportion of the neck diameter relative to the maximum width (i.e., shoulder diameter) varies from about .75 to .5. Clearly, it is easier to access the contents of the vessels with a higher neck diameter:shoulder diameter proportion. The obvious implication is that vessel form is considerably more varied than usually portrayed.

This should not be a surprise since ethnoarchaeological study of pottery consumption reveals that household assemblages characteristically contained multiple vessel forms used for different purposes (e.g., Arnold 1991:62–65; Arthur 2006:73-86) The variation in the Smoky Hill phase pottery assemblages is not as noticeable as it is in assemblages from sites to the east and southeast where bottles, bean pots, open bowls, or plates may appear. In the central Kansas case, functional variation apparently was achieved by constructing variants of the basic jar, sometimes opening its orifice widely, sometimes greatly restricting its orifice, sometimes making a large vessel, sometimes making a small vessel. I am beginning to collect some systematic data on this variation, with an eventual goal of evaluating the partitioning in these functional indicators and correlating them with such factors as how dramatically the rims flare (note that the Kohr House 1 vessel with the highest neck:shoulder diameter proportion also has a widely flared rim, which also would facilitate accessing the vessel's contents) or how squatty the vessel body might be. Some of these functional indicators are reasonably well understood (e.g., Hally 1986; Henrickson and McDonald 1983). They need to be applied to Central Plains tradition vessel assemblages to better characterize those assemblages. The lesson of the previously-missing pots from Kohr House 1, in concert with the pots we have known about all along, are that these assemblages are more varied than we have understood.

A second lesson of this assemblage, of course, is the value of returning to museum collections to extract new information from them. For sites such as the Kohr site, they are all that remains.

### **Acknowledgements**

Small as this pottery assemblage is, in terms of number of vessels, the known vessels (still not even all of them) reside in three locations spread along about 150 miles of I-70. None of them, of course, are where I live (Manhattan), so this paper

is put together from things people in other places have told me about and let me look at. I first thank the late Harold Reed and Margie Reed (Salina) for making the reconstructed vessel available to me for study back in 2002. I worked here from notes I made at that time (although I think I returned a couple years later to take the photograph I used). I also thank Mary Adair for showing me a box of ceramics from the Whiteford Collection at the Archaeological Research Center, University of Kansas (Lawrence), and for loaning me the material to study. That recent discovery was the impetus for this paper. Thanks too to Chris Garst for hauling out once again the Kohr House 1 pottery at the KSHS (Topeka) so I could make a few more observations than I had recorded when I first described the material in 2001. Don Blakeslee showed me collections and records from the Richard Stauffer Collection at Wichita State University. Stauffer had no pottery from this lodge, but his records, in comparison with those made by others, contributed to my understanding of the site.

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**(Footnotes)**

<sup>1</sup> The later version of the portion of this booklet dealing with Kohr House #1 is mostly, although not quite entirely, a reprint of the earlier version; it is burial pit, or cemetery, information in the rest of the booklet that substantially changed between the two versions. So many people have

one or the other but not both versions of this booklet that it is always helpful to cite each edition for information common to the two versions

<sup>2</sup> This statement revises my earlier conclusion (Roper 2001:99) that the collection once contained three restored pots and twelve rim sherds.

***Investigation of a Modern Method for Improving Management and Protection of Heritage Assets in Threshing Machine Canyon (14TO105), Kansas, Using Light Detection and Ranging (LiDAR) Technology***

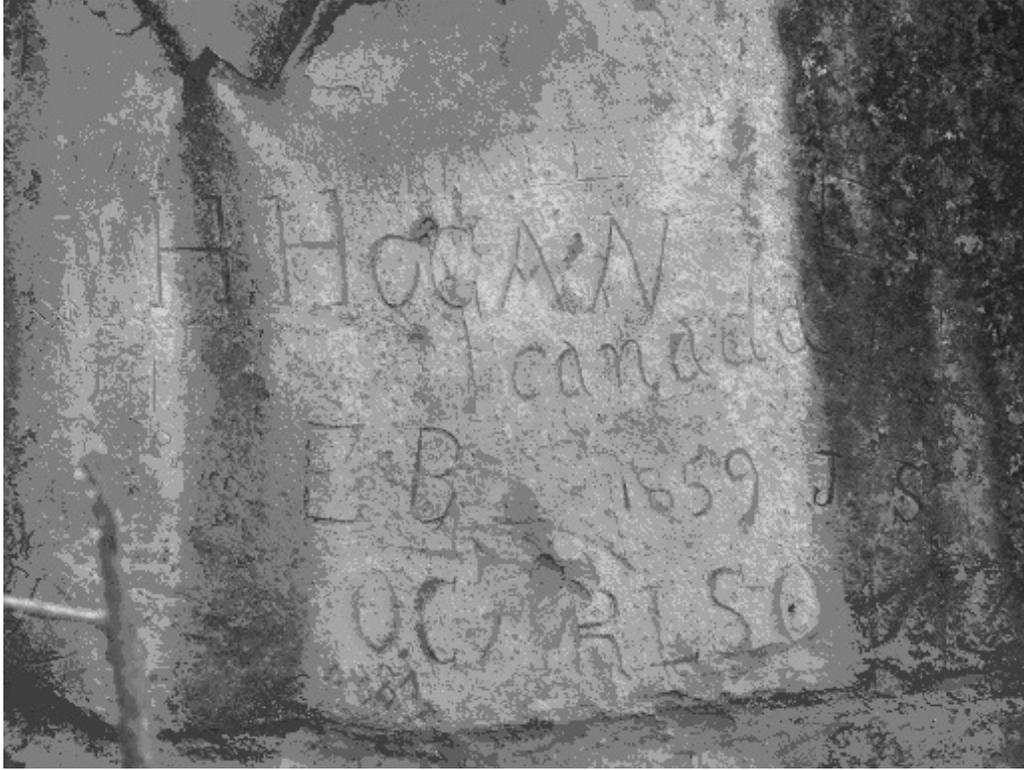
**Bill R. Chada  
Nebraska-Kansas Area Office, Bureau of Reclamation**

The Nebraska-Kansas Area Office of the Bureau of Reclamation (Reclamation) is utilizing the expertise of the Remote Sensing and Survey Group out of Reclamation's Mid-Pacific Region and the project management skills of the Land Resources Office in Reclamation's Office, Program and Policy Services to document historic era rock art, petroglyph panels. The rock art being studied is located in Threshing Machine Canyon at the Blufton Station along the Smoky Hill/ Butterfield Overland Trail at Cedar Bluff Reservoir, Trego County, Kansas. It dates from the mid-nineteenth century and is subject to natural erosion and vandalism. Use of LiDAR technology

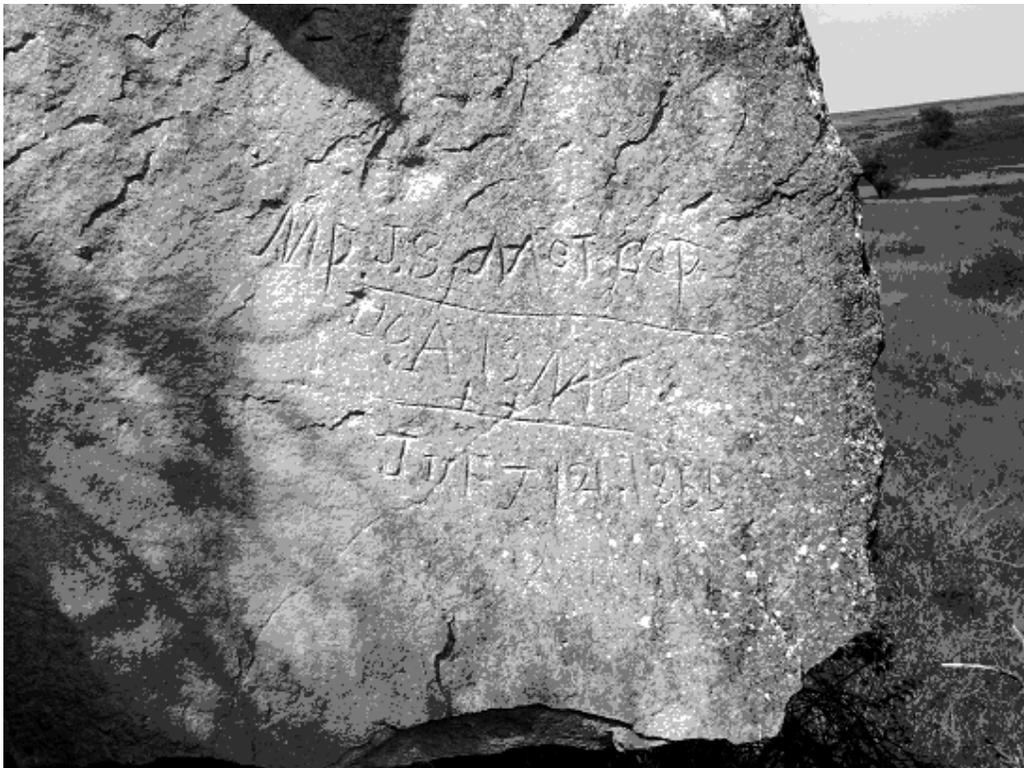
will provide highly detailed three-dimensional imagery of the petroglyphs so managers can document base-line condition of the rock art at a very fine scale, and pinpoint those panels that need intervention to retard erosion or reduce vandalism. Application of LiDAR technology should create significant cost savings over tradition rock art recording methods as well as provide data which will be used in resource protection and preservation.



*Figure 1. Cat. #372-705-00285*



*Figure 2. Cat. #372-705-00209*



*Figure 3. Cat. #372-705-00281*

***"With No Stillman Among Them":  
Reburial of the Stillman Family Cemetery, Manhattan, Kansas***

**Jeremy W. Pye (University of Florida)  
Donna C. Roper (Kansas State University)  
Holly C. Smith (Bureau of Reclamation)**

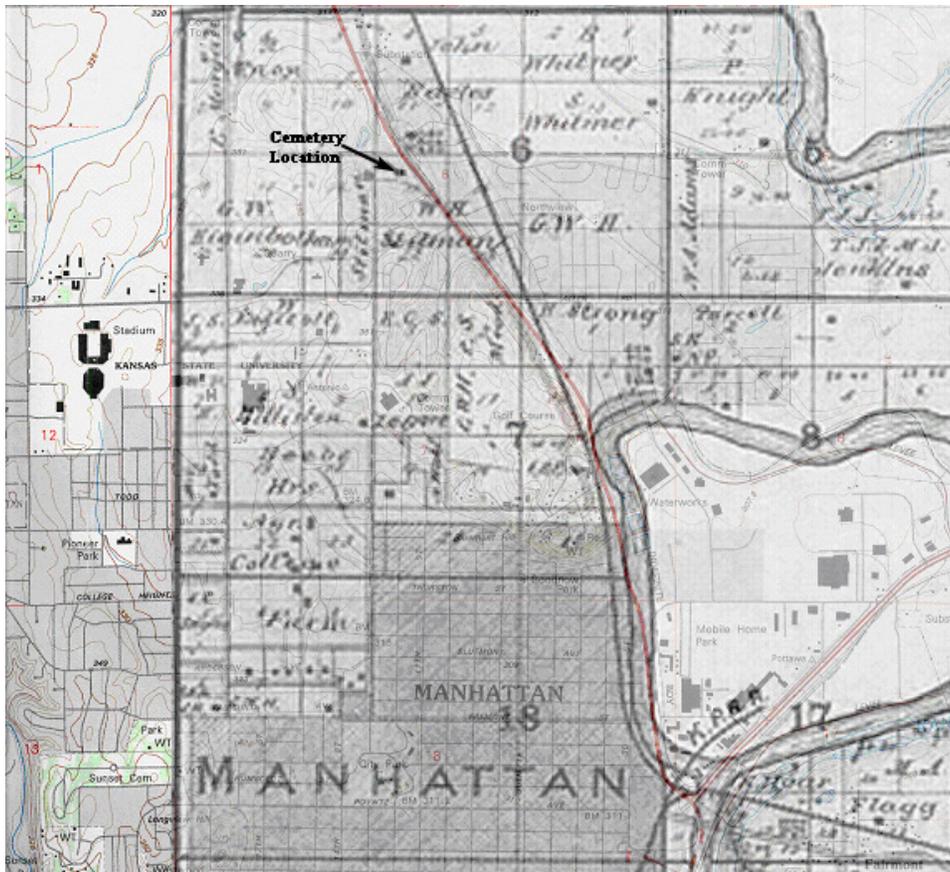
“A few headstones worn with age and the Kansas wind are all that remain of a life lived long ago near Meadowlark Hills” (Klein 2007). On Sept. 14, 2007, 3 years to the day from the end of the excavations, 13 sets of human remains were reentered on the grounds of Meadowlark Hills Retirement Community in Manhattan, Kansas (Figure 1). The reburial cemetery, named Stillman Cemetery, re-creates an original nineteenth-century burial ground that lay about 55 meters to the south, southeast, at the high point of the bluff edge overlooking the Big Blue River (Figure 2). The original cemetery has very little historical documentation, but came to be called Meadowlark Cemetery by the archaeologists working on the site. The cemetery is not listed in the *Cemeteries of Riley County* book (RCHS 1990)—although a mention there of three “miscellaneous burials on private property” now is known to refer to this cemetery—nor is it known to be portrayed on any historic map.

Meadowlark Cemetery once had at least four formal headstones, all but one of which had been removed by early in the twentieth century. Thus, by the early twenty-first century, almost nothing was known about this cemetery other than that there was one at this location. In preparation for construction, and with exhumation authority from Riley County District Court, the original cemetery was excavated in the summer of 2004 by professional archaeologists, under the direction of Dr. Donna C. Roper of Manhattan. Much of what is known about the size and configuration of the cemetery was learned during that excavation (Pye et. al 2004). Analysis of the remains and artifacts within the cemetery and historical research subsequently were conducted by Mr. Jeremy W.

Pye as part of his MA research at the University of Arkansas and have served to fill in much detail (Pye 2007).

The original cemetery lay near the northwest corner of a parcel of land patented to Dr. William Henry Stillman in 1860 (Riley County Register of Deeds, Book J, page 485) (Figure 3). Born in Rhode Island, Stillman first came to the Manhattan area in 1855 and took up land in Blue Township in western Pottawatomie County. Six months after his arrival, he returned to Rhode Island to settle some business affairs, but was stricken with pneumonia for six months. Upon his return to Manhattan, he found someone else in possession of his Blue Township land. In 1860, he obtained the land in eastern Riley County that he held until his death. He lived in a house, since demolished, on a small terrace low on the bluff slope, about 110 meters southeast of the original cemetery. Stillman was a farmer and physician (RCGS 1976). During the 40 years he lived here, he provided indigent care and, in the period from at least 1880 to 1893, ran an unofficial poor farm as evidenced by county payment records documented in various period Manhattan newspapers (including the *Manhattan Enterprise*, *Manhattan Nationalist*, *Manhattan Mercury*, and many others) (Pye 2007). The possibility that he also ran an unofficial orphanage has not been confirmed. Stillman actively sold or leased portions of his property throughout his life, but he retained this portion of the property until his death in 1900 (Riley County tax rolls and census records, on file at Riley County Historical Society).





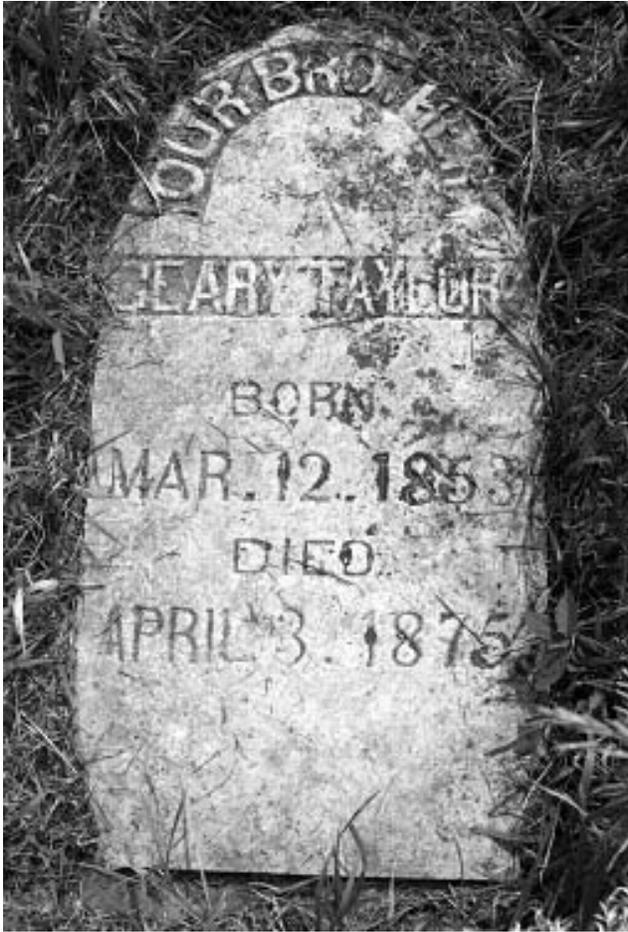
*Figure 3. 1881 plat map overlaying Manhattan 7.5 minute quadrangle map, showing the location of Meadowlark Cemetery in relation to the Stillman property*

with hand-cleaning of the stripped surface, revealed the cemetery configuration.

Each grave was carefully excavated using small trowels, and the remains within them were exhumed. In many instances, the presence of a burial was first signaled by the appearance of coffin hardware. Maintaining a

Excavation was initiated around the Geary Taylor headstone (a very heavy headstone presumed to have fallen near the grave it marked) and over a nearby depression (Figure 4). No grave, but extensive rock, as if forming a pavement, was found around and under the Geary Taylor headstone. The depression, however, did indeed indicate a grave. This grave was empty, but the grave shaft reached to bedrock, about 5 feet below the pre-excavation surface. This was important information. So also was the finding that graves would be recognized by the presence of dark contrastive fill with an amount of rock that was noticeably contrastive with the matrix surrounding the grave. With this information available, and with rapidly decreasing faith in either the ground-penetrating radar study or other potential indicators of the cemetery layout, a skid loader was brought in to carefully and slowly remove mixed upper sediments and expose the graves. This, combined

level excavation surface within the grave usually would reveal the outline of the coffin by its hardware. In three instances, the wooden caskets themselves were reasonably well preserved. This material would be photographed and drawn in place, then removed to expose the skeleton. Because of the possibility that bodies had been embalmed and the likelihood that, if they were, arsenic had been used, prior to exhumation, soil samples were taken to test heavy metal (arsenic, lead, mercury) concentrations. A primary reason for this was protection of the excavators; a secondary reason was to learn if the individuals had been embalmed (none had been). After the results were received, wooden, plastic, or bamboo picks or spatulas, or dental picks and small paint brushes, were used to excavate the skeletons. Each skeleton was fully exposed and recorded before removal. Any clothing parts, most particularly buttons and occasionally pins, or other personal effects also were carefully plotted and



*Figure 4. Geary Taylor's headstone that remained on the Meadowlark Hills property at the*

photographed relative to their location on the skeleton. Small soil samples were taken from the abdominal region for later use in determining if any of the individuals had parasite infections.

The final configuration of the cemetery, as revealed by excavation, was an area measuring about 15-x-20 meters (Figure 5). It was oriented about 30° counter-clockwise from the cardinal directions. The burial area was surrounded on the north, west, and south by a stone pavement. Whether these formed a walkway or were the base of a wall is not clear. This pavement or wall must have been built fairly late in Stillman's tenure on this land, since one grave, that post-dates 1881, is under it. Another grave is partially under it, although this is one of the early interments in the

cemetery. Two graves lay outside the partial enclosure of the pavement or wall. The south part of the pavement or wall had a gap about 2 meters wide. Flanking the gap were two square features that probably represent the foundations for a cemetery gateway. A path leading directly south through this entryway would lead to Stillman's residence downhill from the cemetery.

A total of 17 graves were revealed and excavated. The graves were arranged in, but somewhat irregularly spaced along, three incomplete parallel rows. Lengths and widths of graves varied, depending on the size of the coffin/casket, and that depending on the size of the individual to be interred in it. Graves were on average around 150 cm deep, or about 4½ to 5 feet with the coffin/casket resting on bedrock. The deceased had been laid on their backs in wooden coffins or caskets and buried with their heads to the west. Documentary evidence shows that four bodies were moved from this location to Sunset Cemetery more than century ago. Consistent with this, four graves were empty. According to Sunset Cemetery records, the remains of Geary Taylor, and his niece, Martha Jane Taylor were reburied at Sunset in 1880 by Geary's brother, Owen Taylor. Dr. William Henry Stillman and a daughter Elsie Stillman were relocated from the Meadowlark property to sunset in 1901 by another of Stillman's daughters, Charlotte "Lottie" Stillman (Soldan and Olney 1979). No historical records have been located to suggest that any Stillmans remained buried at Meadowlark Cemetery after the 1901 removal.

During the excavation of Meadowlark Cemetery, researchers encountered many different attitudes toward the dead that surfaced from the people that visited the site. One such response was of resignation and awe, the reflection of an ingrained fear of death. The lives of those long dead ever influence and frame the world in which the living dwell. And the living in turn are responsible for the maintenance of the dead (Pye 2007:228). As Rebecca Yamin (2001:166) wrote, "It is not the artifact lists or statistics drawn from census records

## Meadowlark Cemetery, Manhattan, Kansas Plan Map of Excavation Area

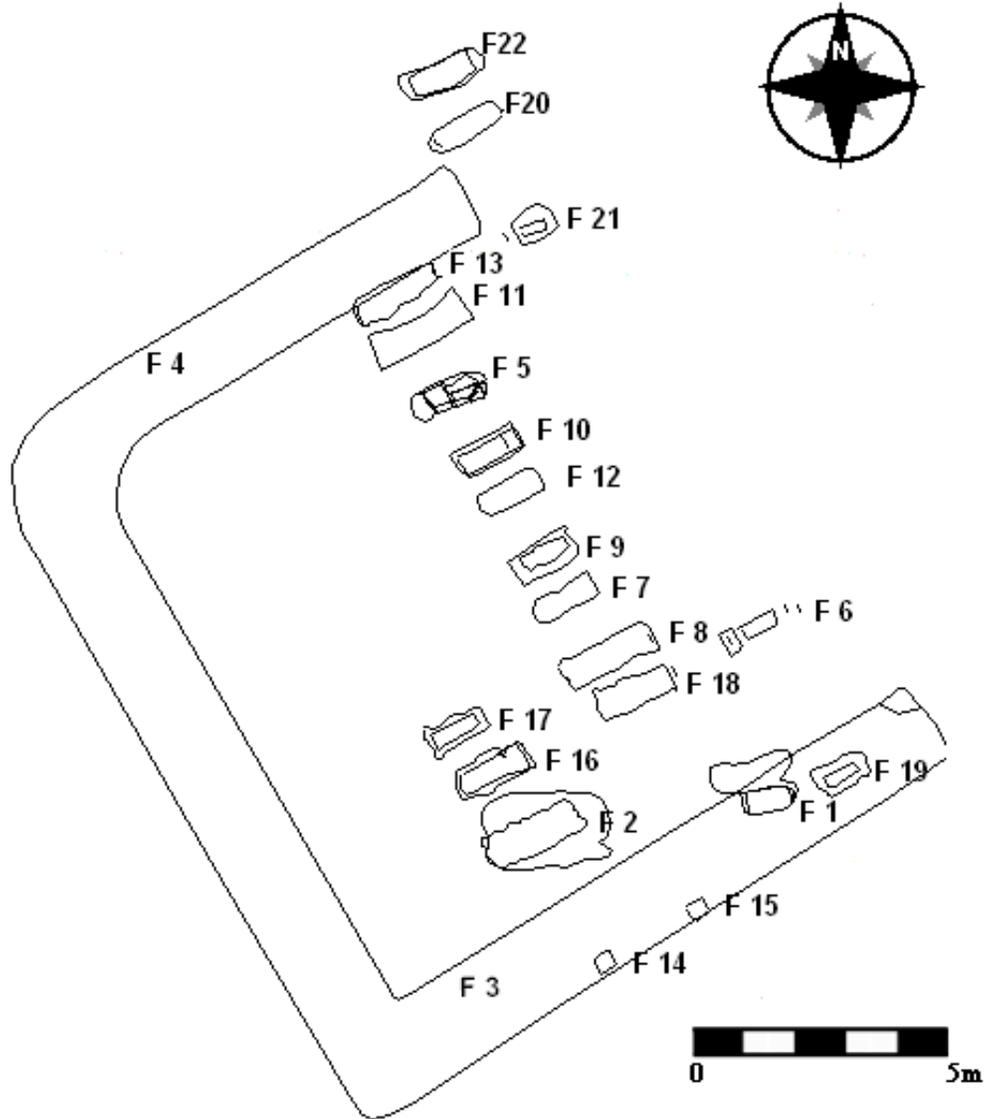


Figure 5. Meadowlark Cemetery plan map made following excavations

that make these people visible, it is the narrative process of imagining their lives.”

The Meadowlark research over the past three years uses the lives of the individuals interred at Meadowlark Cemetery as a reference point to interpreting the recovered material in a way that

can illustrate the social interactions that took place in nineteenth century Manhattan, Kansas. Ultimately, the goal of this research has been to remember those people whose loved ones swore they would never forget. With them we have stood by the open graves, witnessing their beloved friends

and relatives consigned to undistinguishable clay; and with them we shall keep alive the memory of their lives, and sorrow for their untimely deaths (Pye 2007:238).

**Reinterment Plan**

The re-created cemetery, now officially known as Stillman Cemetery, is about 80% of the original size (Figures 6 and 7). The walls have been slightly reconfigured to enclose all graves. Otherwise, the cemetery is faithful to the original in orientation and layout, even including the empty graves. All individuals from the original cemetery are re-interred here. Each is in an individual grave. All the deceased are laid on their backs with the most bones in overall anatomically correct positions, within individual cloth-covered wooden caskets. As in the original, the heads are to the west (technicly west-southwest). All preserved coffin wood and hardware, as well as all buttons and other personal effects were placed within the graves prior to reburial. All coffin hardware from otherwise empty graves was also placed in the corresponding new grave.

Stillman Cemetery was constructed, as can be seen in Figure 6, in the same orientation as the

original Meadowlark Cemetery (see Figure 5). Great care was taken by Anderson Knight Architects and Hittle Landscape Architects in the construction and ultimate appearance of this cemetery. The cemetery was designed to be a part of a new walking trail that winds through the Meadowlark Hills property. A low roughly constructed limestone wall was constructed around

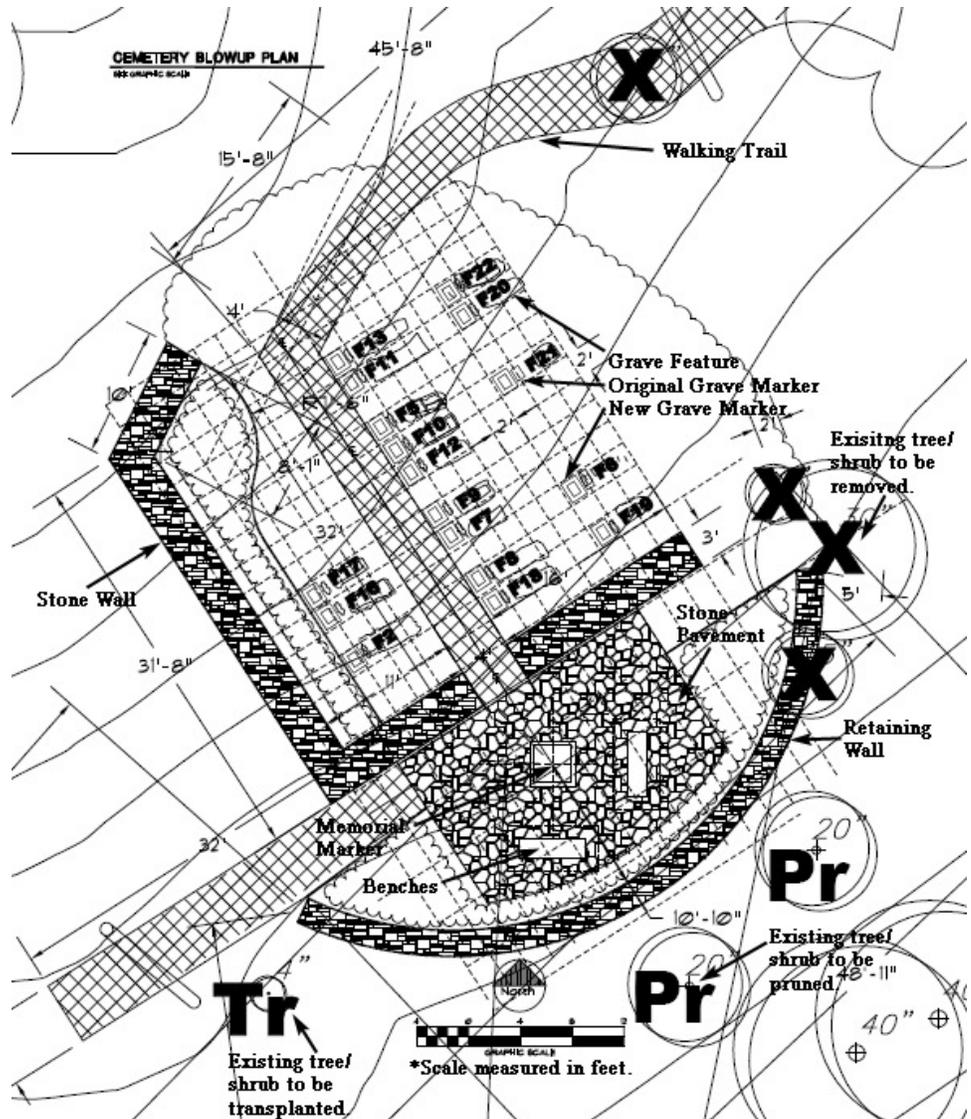


Figure 6. Stillman Cemetery Blowup, adapted from Meadowlark Hills Stillman Cemetery Project Cemetery Blowup Plan, Schematic L-2a, Hittle Landscape Architects. Submitted 6/12/2007



*Figure 7. Image of Stillman Cemetery after the reburial ceremony, looking East*

three sides of the cemetery to mimic the esoteric stone alignment that enclosed three sides of the original cemetery. Benches were placed at the entrance to the cemetery as well as a limestone pavement to allow residents the opportunity to sit and reflect within the new cemetery.

At that location, a memorial marker was set up to give the passerby some information about the excavation of Meadowlark Cemetery and the creation of Stillman Cemetery (Figure 8). The memorial marker was constructed from C.M.U. filler surrounded by 4000psi air-entrained concrete, and measured 4-x-4 feet at the base. The lengths of the edged at the top of the monument measured 3'-4" at the North side, 3'-6" at the South side and 3'-6 1/4" on both the East and West sides. The tallest portion of the marker, which is the Northern side measures 3'-4 1/2" in height, while the South side slants to 2'-6 1/8" in height. In the center of each side of the memorial marker, the letter denoting the cardinal direction was sandblasted into the concrete. These letters each measure roughly 12" in height, and are written using the Cataneo Swash BT font. The informational plaque (Figure 9) set

within the top on the memorial marker measures 32-x-32 inches and is made of dark granite.

The architects consulted excavation documents during the planning and construction phases of Stillman Cemetery. Based on these documents, Table 1 shows the measurements of the graves needed to accommodate the reburial containers. It also shows the feature numbers, names of the individuals associated with the graves (if known) as well as whether or not the grave was associated with an original grave marker that needed to be replaced prior to the reburial ceremony.

Each of the graves was marked with a new grave marker, regardless of whether or not they had one at the time of excavation. These markers are sunken markers, flush with the ground, measuring roughly 50-x-40 cm, and consisting of a concrete surrounding a dark granite plaque (Figure 10). The marker plaques give identifying information for each of the individuals reinterred: name (if known), age (or estimated age), sex, birth/death dates, or estimated date range of original interment, excavation year, as well as reburial year. The



Figure 8. Memorial marker placed at the entrance to Stillman Cemetery, looking North-



Figure 9. Informational plaque placed within the memorial marker erected at the entrance to Stillman Cemetery

markers were placed at the head (or West) end of each grave, and in most cases were oriented to be read from the West end of the grave. The original limestone field-markers were reset in association with their original graves, and the professional markers of Sarah Jane Jackson and Eliza Peters were repaired and reset. The inscriptions of these

two stones were reset facing East. The gravestones of Martha Jane Taylor and Geary Taylor that had been recovered during the course of the Meadowlark Cemetery excavation and analysis were donated to Sunset Cemetery by Meadowlark Hills so that these markers might adorn the graves of those individuals once more.

The remains were reburied in white, cloth-covered caskets, much like the Kingston White cloth-covered caskets (Figure 11) advertised as being sold by Phil's Casket Company, Inc. of Yonkers, New York. The

casket has a white cotton cloth covering embroidered with floral designs. The cloth covers the casket made from pressed wood. The interior is lined white crepe, and the sides of the adult-sized, and medium-sized caskets are mounted with white, aluminum, extended-bar handles on either side for easier carrying. Three sizes of Kingston White caskets were acquired as reburial containers, an adult-sized casket measuring roughly 70-x-175 cm, a medium (or child-sized) measuring roughly 50-x-125 cm, and a small, child-sized casket measuring roughly 40-x-100 cm. The smallest sized casket did not have any handles. The lids were hinged on one side and the head and foot ends of the lids could be opened independently of each other on the adult and medium-sized caskets, while the lids of the small caskets were constructed of one piece. For those four graves that contained only artifacts, or at least a paucity of human bone, small balsa wood boxes were constructed for the reinterment. These boxes measured roughly 15-x-20 cm, and had a thin lid that slid shut in a groove cut within the sides of the box.

Each of the reburial containers were identified with an engraved hard plastic plaque screwed into the lid with Phillips-headed steel wood screws (Figure 12). These plaques were

## Current Archaeology in Kansas

Feature	Name	Excavation Size <i>Depth x Width x Length</i>	New I.D. Marker	Items to be Reset		
				<i>Headstone</i>	<i>Footstone</i>	<i>Other Features</i>
F2	Dr. William Stillman	12" x 12" x 12"	Yes	None	None	None
F5	Elsie Stillman	12" x 12" x 12"	Yes	None	None	Native Limestone Capstone
F6	Sarah Jane Jackson	30" x 30" x 40"	Yes	White marble tablet and base	White marble Native limestone	None
F7	Unknown	30" x 30" x 40"	Yes	None	None	None
F8	Unknown	30" x 40" x 80"	Yes	Native limestone	Native limestone	None
F9	Unknown	30" x 30" x 40"	Yes	None	None	None
F10	Unknown	30" x 36" x 60"	Yes	None	Native limestone	None
F11	Geary Taylor	12" x 12" x 12"	Yes	None	None	None
F12	Unknown	30" x 36" x 60"	Yes	None	None	None
F13	Unknown	30" x 40" x 80"	Yes	Native limestone	Native Limestone	Horizontal Surface Stones
F16	Unknown	30" x 30" x 40"	Yes	None	None	None
F17	Unknown	30" x 36" x 60"	Yes	None	None	None
F18	Unknown	30" x 36" x 60"	Yes	None	Native limestone	None
F19	Unknown	30" x 30" x 40"	Yes	None	None	None
F20	Unknown	30" x 40" x 80"	Yes	Native limestone	None	None
F21	Martha Jane Taylor	12" x 12" x 12"	Yes	Native limestone	None	None
F22	Possibly Eliza Peters	30" x 40" x 80"	Yes	Obelisk	None	None

Table 1. Table showing original features, dimensions of reburial graves (measured in inches), pres-



Figure 10. New markers placed on each grave



Figure 11. Kingston White Cloth-Covered Casket, as advertised on the website of Phil's Casket Company, Inc. [http://www.philscasket.com/Phils\\_Casket\\_x.html](http://www.philscasket.com/Phils_Casket_x.html)



Figure 12. Identification plaque on casket lid

placed in the center of the lid on the small balsa wood boxes, at the apex of the domed lids over the at the head of the small and medium-sized cloth-covered caskets, and at the right hand side of the lids of the adult caskets toward the mid-line of the head portion of the lid. The plastic plaques give identifying information, mirroring that given on the new grave markers, for each of the individuals reinterred; such as name (if known), age (or estimated age), sex, birth/death dates, or estimated date range of original interment, excavation year, as well as reburial year.

### The Reburial Ceremony

*Manhattan Mercury* columnist Kate Waller wrote, "...shortly after noon Friday a horse-drawn carriage driven by two men in period costumes headed to the new cemetery from the Yorgensen-Meloan-Londeen Funeral Home carrying new caskets" to Stillman Cemetery. (Waller 2007, see Figure 13). The human remains, as well as artifacts recovered in association with the burial had been assembled within the new caskets in the two days prior to the reburial by Dr. Donna Roper and Nancy J. Arendt in the facilities of the Yorgensen- Meloan-Londeen Funeral Home. On the morning of the reburial, the 30 or so pallbearers, dressed in all black assembled at the funeral home. Those individuals slated to bear the caskets of children to the newly dug graves were given white armbands

and white gloves as was the custom in some parts of the country in the nineteenth century; others wore back armbands and grey gloves to signify that the remains they carried were of an adult.



Figure 13. The horse-drawn carriage carrying the new caskets through Manhattan lead by police escort

The new caskets were loaded into the backs of a horse-drawn wagon and a funeral home van. A funeral procession, lead by a police escort, then wound its way through Manhattan, Interested students and passersby stopped to look as the funeral train passed Kansas State University and eventually stopped in front of the doors of Meadowlark Hills. In accordance with late nineteenth century customs, the doors had been draped with black crepe as a sign of mourning and of respect for those deceased individuals who would soon be laid to rest in the earth once more.

After introductory remarks by Reverend Ben Duerfeldt, Dave Zerfas regaled the audience, that consisted of about 150 people, including Meadowlark Hills residents, staff, pallbearers, KSU professors, three classes of 5<sup>th</sup> grade classes from Amanda Arnold Elementary School, and other interested individuals (along with an assortment

of media from Manhattan and beyond), with his rendition of “Home, Home on the Range.” After the end of the song, Bruce Gbur, a bagpiper played as the horse-drawn carriage was driven from the entrance of the main clubhouse building of Meadowlark Hills down to the cul-de-sac constructed in front of the residential units build on the site of the original cemetery. The pallbearers removed the caskets from the vehicles and carried them down the hill to the new cemetery location (Figure 14), placing them on wooden slats over the graves as the bagpiper finished playing.



*Figure 14. Pallbearers carry the caskets in a procession to Stillman Cemetery, led by Rev. Duerfeldt in period dress*

The pallbearers retreated to the North end of the cemetery for the duration of the introduction and eulogy as Rev. Duerfeldt again addressed the crowd. “Someone once said that you could fairly well evaluate a community based on how they take care of their cemeteries, and I believe its true. Because I think that anyone who cares enough to take care of cemeteries cares about history and heritage and other people—even the deceased.” After a brief prayer performed by Rev. Duerfeldt, Dr. Donna C. Roper spoke about the original excavations as well as background to the cemetery and the history of the individuals interred in the original cemetery. “This is definitely the most dramatic ending of a study that I’ve encountered,” concluded Roper, who added that “we [the archaeologists] feel a sense of closure with this ceremony” (Waller 2007).

Meadowlark CEO Steve Shields gave the eulogy following Roper’s address. “It is very appropriate and very fitting that we gather here today. As we live out our lives in this twenty-first century we don’t stop often enough and look back.

There is so much that is pulling us forward. As we reflect on our daily lives and how we came to be where we are, standing in this place it’s always a result of those who went before us...their legacy was their map, their legacy was a way for others to follow...We are living in the shadow, here on this property, of a legacy. Dr. William Stillman, who came here in the middle of the nineteenth century, was among the very first of very early citizens to realized that we must attend to one another. We must care for those who need it, and he set about in his unofficial way to attend to others—most probably these people who were real people who lived. Were those that were either in receivership of his care or were his partners in care. Meadowlark Hills lives in that legacy. Meadowlark understands the responsibility of our legacy, and part of that is to attend to those that have gone in our past. Because of Dr. Stillman, this is hallowed ground...We take very seriously in our town caring for one another, and we are but one of the many vehicles that express that. So in closing, we honor these folks who...some never made it out of the

womb, some experienced just 18 months of short life, others like Dr. Stillman lived to be an old man. But regardless of their life experience, their life had value and this cemetery is what will hold them in memorium until the next holder of the legacy protects them further.”

“I was standing up here earlier in the week in an evening,” said Dave Zerfas, “and I was thinking about this little cemetery. When it was started if you take away those trees [pointing to the bluff edge overlooking Tuttle Creek Blvd.] and if you sit here...and the river was down below...and the view to the East and the hills...and all you could see, what a fabulous spot this is, and the fact that you got trail ruts running right through here [speaking of the Ft. Leavenworth-Ft. Riley Military Road] this is a wonderful historical site.” This sentiment was followed by a reading of John Greenleaf Whittier’s poem “The Kansas Emigrants.” The caskets were lowered into the graves as Chad Miller sang “Shall We Gather at the River.”

After the lowering, Rev. Duerfeldt reclaimed the podium with a prayer, “Oh God...we thank you for what we are doing today, honoring these deceased who lived here long before us. We thank you for all of our heritage...for those who lived and died making our world in Manhattan, Kansas, what it has become, and thus were the building blocks for the very lives we now enjoy. We thank you for their contributions, their struggles, their part of our history, how ever long or short that might have been because we recognize that they helped in real and demonstrable ways to shape our own existence in a world too often characterized by hate and greed and violence. We thank you for the moments of love, mercy and decency that inspire us to live our lives as best we can—for we too will become someone’s heritage. In sure and certain hope of the resurrection to eternal life, we commend to almighty God these

our brothers and sisters and we commit their remains to the ground. Earth to Earth, ashes to ashes, and dust to dust. The Lord bless them, the Lord make his face to shine upon them and be gracious unto them, the Lord look upon them with favor and give them peace. Amen. Will you please begin to fill the graves?”

At this request, Dave Zerfus began to sing “When the Smokey Runs Dry” as a pallbearer from each grave was passed a golden ceremonial shovel to return to each grave a shovelful of earth, which fell resoundingly upon the lids of the caskets, to conclude the reinterment ceremony. School children, pallbearers, the elderly and the young alike, Meadowlark staff members dressed in period clothing (Figure 15), began to file out of Stillman cemetery, returning to their jobs, their lives, the modern world. The archaeologists lingered to gain those last few moments of closure, and to reflect on the excavations and subsequent three-year association kindled accidentally between themselves and the deceased buried at Meadowlark Hills (Figure 16). The Meadowlark Cemetery



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*Figure 15. Meadowlark staff-member attired in frontierswoman dress*

excavation and research, and the Stillman Cemetery dedication sparked interest in the hearts of the Manhattan community and served to elucidate some of the forgotten stories and history associated with this place and these people. However, the song sung by Zerfas still hung in the air as the archaeologists also filtered out of the cemetery...“When the Smoky runs dry then our memories will die...wash our tears and our blood to the sea. And if their stories are lost, we’re not aware of the cost, and the Earth holds her secrets unseen.”

### Acknowledgements

The authors as well as Meadowlark Hills offers thanks to the many Meadowlark staff

members, Meadowlark CEO, Steve Shields, Meadowlark residents, and Manhattan residents that support and showed interest in the excavations, subsequent research, and reburial. Members of the excavation crew included Donna C. Roper, Jeremy W. Pye, Holly C. Smith, Nancy J. Arendt, Marlin D. Arendt, Cynthia L. LaBarge, Hillary Glasgow, Tobias Blake, Amanda Phillips, Daniel Keating, Trever Murawski, Luke Bockelman, Ester Kimbel, Amber Campbell, and Dustin Caster. Environmental testing was facilitated by Brad and Dee Johnson, Associated Environmental, Inc. The new cemetery, Stillman Cemetery was designed by Tracy Anderson of Anderson Knight Architects and Thomas J. Hittle of Hittle Landscape Architects. The dedication and reinterment ceremony was very successful due to the efforts of volunteer



*Figure 16. The original archaeological crew reflecting over an open grave after the ceremony: Marlin D. Arendt, Nancy J. Arendt, Holly C. Smith, Donna C. Roper, Cindy LaBarge*

pallbearers, Meadowlark staff, the Yorgensen-Meloan-Londeen Funeral Home, Ron Roller of Triple R. Carriages, Rev. Ben Duerfeldt, Dave Zerfas, Briggs Auto Group, Buffalo Phil Ray, and bagpiper Bruce Gbur.

**Note** — Meadowlark Hills produced a DVD documentary about the cemetery, including most of the ceremony, based on video footage shot during the ceremony, photos provided by the archaeologists, and videotaped interviews with Roper, Pye, Meadowlark personnel, the cemetery architect, and others. All of us have copies of this DVD and it also is available in other places around Manhattan. A printed program also gives additional detail about the cemetery. Extra copies probably are still available from Meadowlark and Roper has a small supply of them.

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the possibility that the cemetery was associated with a poor farm. The short article is in English. An electronic reprint can be obtained from Pye or Roper; and probably is on-line through Instituto Oswaldo Cruz.

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### ***The Michael Fisher Collection from the Fanning Site, 14DP1: A Preliminary View***

**Jim D. Feagins  
Belton, Missouri**

The Michael Fisher Collection is the second recently analyzed collection of Oneota material from the Fanning site, 14DP1. It follows a similar analysis of the Terrance Dyche collection from this Doniphan County, Kansas site (Feagins 2007). A brief announcement or preliminary summary of then-ongoing work was presented in last year's *Current Archaeology in Kansas* (Feagins 2006:30). The Dyche collection is curated at the Wyandotte County Museum, in Bonner Springs, Kansas.

The Michael Fisher collection from the Fanning site was found to be well organized, labeled, and essentially ready for analysis. As expected, it obviously had been well maintained by Fisher. (He is a long time volunteer Archaeological Researcher at the St. Joseph Museum, president of the St. Joseph Archaeological Society, President Emeritus of the Missouri Archaeological Society, and along with his wife, Marge, a recipient of the Carl H. and Eleanor Chapman Award from the Missouri Association of Professional Archaeologists.)

Briefly, the Fisher collection from 14DP1 contains almost 1,500 items obtained during a period of approximately two decades—from the late 1950s to the late 1970s. The collection was obtained solely from the surface except for two

excavated pits that were inadvertently discovered. Pit # 1 was found after heavy sheet erosion exposed an area of higher artifact concentration in the plowzone (Fisher, field notes, May 16, 1962) and pit # 2 was found after waterway construction by power equipment (Fisher, field notes, 1972). Fisher Pit # 1 contained a bison scapula hoe, two blunt-end scrapers, a retouched flake, 38 sherds of pottery and other items. Fisher Pit # 2 contained 43 pottery sherds, a blunt-end scraper, a side scraper, a retouched flake, animal bones (bison), and three mussel shells (*Amblema plicata* and *Lampsilis teres*).

Recovered from the site's surface were: 91 rim sherds, 209 body sherds (Figure 1), faunal remains (bison, canid [probably dog], black bear, deer, beaver, and gar), mussel shells (14 identifiable as to species; *Actinonaias ligamentina*, *Amblema plicata*, *Fusconaia flava*, *Lampsilis cardium*, *Lampsilis teres*), 35 pieces of worked and unworked hematite, a couple pieces of red Kansas pipestone, 147 blunt-end scrapers, 167 projectile points and bifaces (mostly un-notched, triangular arrow points), faceted pumice-like stones, 31 (true) bladelets or flake blades, side scrapers, cores, flakes, drills, gravers, a variety of ground stone tools, concentrations of charred corn and charred

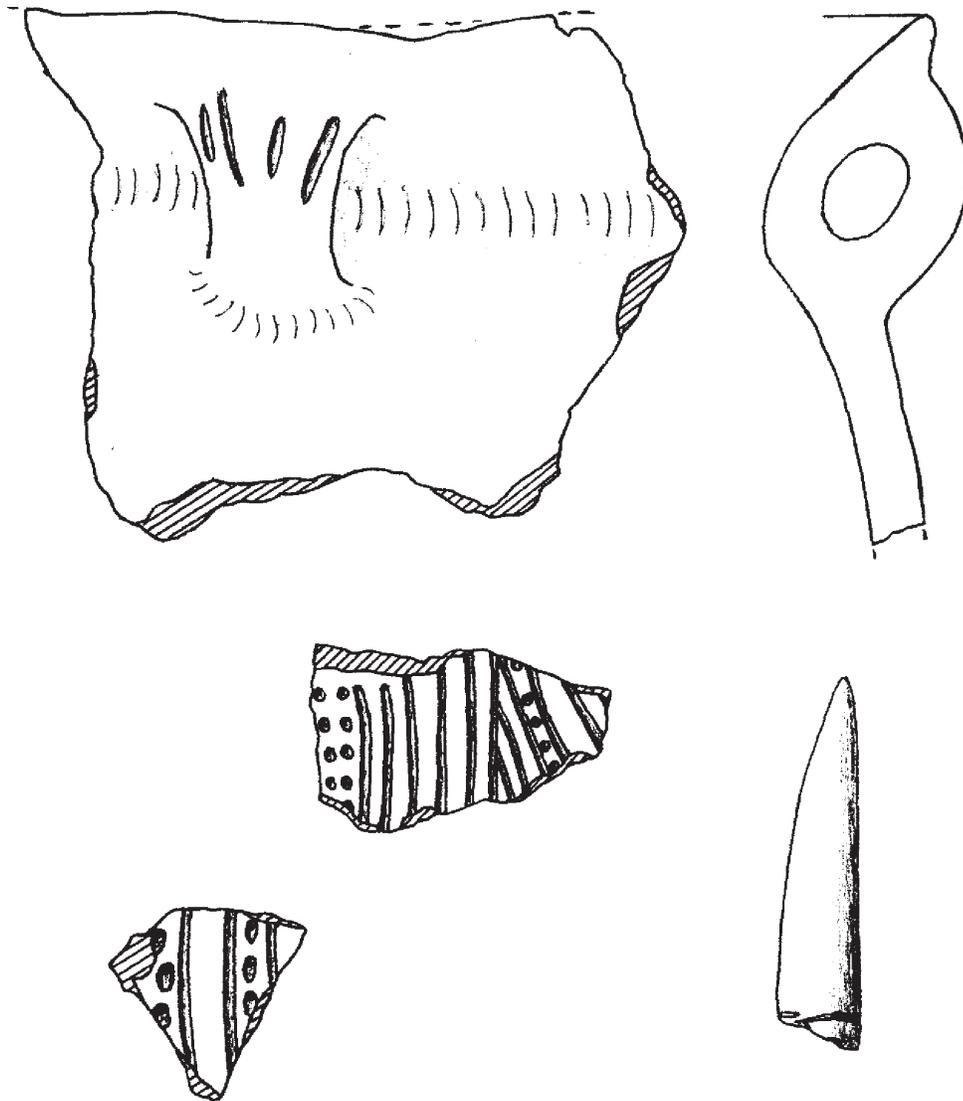


Figure 1. Examples of Shell-tempered Pottery and Worked (Cut and Snapped) Antler from the Fanning Site (Mike Fisher Collection) Upper (B315); Lower right (B3254); Lower left (B143). Sketches by Jim Feagins. Artifacts are pictured at 80% actual size.

groundnuts (tubers of *Apios americana*), and miscellaneous items. Most of the charred groundnuts were pierced by small holes where they apparently had been strung on cords to dry. Of special interest are 61 trade items (metal, glass, and shell) of Euroamerican manufacture. In addition to the above artifacts, there are a few pieces from Fisher's Fanning collection (copper tinklers and a copper tube, glass beads and a red stone elbow pipe) on permanent display in an archaeological

stratigraphic exhibit at the St. Joseph Museum. These latter artifacts were also analyzed.

Although, site 14DP1 is almost always considered as a single component site; the Fisher collection reaffirms the presence of a minor Woodland component as first identified by Shock and Bass (1966:208). Also the Fisher collection from Fanning contains several Archaic projectile points. (It should also be noted that the collection of the late Ed Barlow contained an Early Archaic/

late Paleoindian point from the northern portion of the site (Fisher, personal communication) similar to one from the same area in the Fisher collection.) These earlier components are relatively miniscule compared to the latter village materials.

The Fanning site is a protohistoric Oneota village located on 10 or so acres of the upland within the Wolf River (Creek) drainage in extreme northeastern Kansas. Limited professional excavations took place at this site in 1937 by the Smithsonian Institution (Wedel 1959:131-171) and by the University of Kansas in 1963 (Shock and Bass 1966) and again in 1967. The results of the latter excavation have yet to be published. Most researchers (Henning 1970:146, 1993:258, 1998:391-393, 2001:233; Marshall 2006:230-231; Wedel 1959:96, 171, 617, 636) agree, with one exception (Johnson 1991), that this late seventeenth century site is probably (but not completely proven to be) affiliated with the Kansa (Kaw) Indians. The Kansa are Dhegiha Siouan speakers that are distant kin to the Osage, Omaha, Ponca, and Quapaw. However, Johnson (1991) feels that the Fanning site could be affiliated with the Oto, who are Chiwere Siouan speakers. Mason (2006:195-232; see also Henning 1993; Henning and Thiessen 2004) summarizes the broader Oneota dilemma nicely.

The site has not yet been precisely dated, but it is estimated to predate A.D. 1700. Certainly by the time of Marquette's map, produced as a result of the Marquette and Jolliet exploration of the Mississippi River in 1673, the Kansa were located in the general area of the Fanning and other nearby Oneota sites (Wedel 1959:171). The Fanning site is clearly earlier than the Oneota component at the Doniphan site (14DP2). And, trade material suggests that, while Fanning appears to be slightly earlier, it is relatively close to the age of the Oneota component at the King Hill site (23BN1) located in the city of St. Joseph, Missouri. Ceramic studies from the Fanning and King Hill sites show that they are quite closely affiliated (Raish 1979). Together they make up what has been called the Wolf Creek focus of the Oneota aspect (Marshall

2006:231; Wedel 1959:535, 617, 636) or to use more recent taxonomy, the Fanning phase (Henning 1993:258; 1998:392-392).

The Oneota component at the Doniphan site reflects the material culture left by the Kansa tribe who were at that location when they were visited by French explorer, Borgmont in 1724 (Norall 1988; Wedel 1959:100,128). The tribal affiliation of the Doniphan site is generally unquestioned. However, that of the Fanning and King Hill sites (while probably Kansa) remain somewhat problematical.

As was stated by Marshall, "The question of Kansa origins may remain unresolved..." (Marshall 2006:232). The direct historical approach has had a somewhat limited application when applied to Kansa origins. A major handicap to a determination of Kansa origins is the lack of a larger comparative collection of late Native American manufactured materials from the known Kansa village at Doniphan. Lacking that, we shall get a better idea as to what can be accomplished, however limited that might be, at Fanning as analysis progresses with the materials at hand.

Will the data from the trade items in the Fisher collection, and to a slightly lesser degree for the Dyche collection, be able to refining the dating of this earliest probable Kansa village? Or will these added data bases (from the two collections) simply support and reaffirm only what is already known, while slightly expanding knowledge of the site's material cultures variability and generating additional statistical data by which to compare with other western Oneota sites? Either way, it is time to reexamine the Fanning site.

### Acknowledgements

Obviously, this continuing research has been made possible by the efforts of Mike Fisher for the loan of his collection and records. His life long effort to support archaeological research is clearly a work of love. Additional help has been supplied by: Sarah Elder, Curator of Collections, St. Joseph Museum; Rory Ritchie and Randy Ritchie (X-ray Technician and CT scan Technician,

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### *In Search of Flint Hills Chert Research*

Susan M. Houghton  
Burns & McDonnell Engineering Company, Inc.

Valuable research material on the study of chert types from the Flint Hills in Kansas and Oklahoma is scattered in articles, conference presentations, and the CRM literature. The following list is gathered from some of the readily available sources, and is by no means comprehensive. From this small beginning, a collection of material on quarries, chert typology, and artifact assemblages will create a useful tool for researchers.

This bibliography will reflect a variety of research directions:

- the variation in Flint Hills cherts from different locales,
- analysis of lithic sourcing as reflected in collections from specific sites,
- examination of the lithic tool kit, analysis of use-wear and tool type,
- the history of the study of Flint Hills chert sources.

As the bibliography expands, perhaps the same should be created for Smoky Hill lithic resources. Please send information on any publications, presentations, CRM reports or anything else to me at [shoughton@burnsmcd.com](mailto:shoughton@burnsmcd.com) for the new and improved version. Also, please send your ideas as to what type of presentation would be most useful: on-line, published paper, other?

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### *Kitkahahki Archaeology: Investigations at the Pawnee Indian Village, 14RP1*

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Donna C. Roper, Kansas State University  
Jack L. Hofman, University of Kansas

This report is the first in a series on archaeological research on the Pawnee Indian Village (14RP1) that will appear over the next few years. In December 2007, the Archaeological Research Center, University of Kansas, was awarded a contract from the Kansas State Historical Society to inventory and analyze existing collections from this site, conduct limited excavations on selected areas of the site in the summer of 2008, and prepare a final comprehensive report on all of the field work and artifact assemblages. This report provides a background summary of relevant historical documentation concerning the Kitkahahki occupation in the Republican River valley, an overview of previous investigations at the site, an introduction to the goals of the current project, and a very brief discussion of the proposed methods and techniques for addressing the research goals.

#### **Historical Background**

The Pawnee Indian Village, or Kansas Monument site, 14RP1, lies on the bluffs overlooking the Republican River valley in north-central Kansas. It represents the remains of a late eighteenth – early nineteenth century village occupied by the Kitkahahki band of the Pawnee tribe. In historic times, the Pawnee were organized into two divisions and four bands. The Pawnee language, spoken in two dialects is, along with Arikara and Wichita, a member of the Northern branch of the Caddoan language family (Lesser and Weltfish 1932). The Skiri, also called Loup or Wolf, were one division and one band. Referred to by the term *Panimaha* in the older documents, they spoke the Skiri dialect of the Pawnee language. The other division, the South Bands, including the

Kitkahahki, or Republican; the Chawi, or Grand; and the Pitahawirata, or Tappage, bands. They spoke the South Bands dialect. Oral tradition holds that the three South Bands once were a single band, called the *Kawarahki*, which differentiated at a time that is not identified but clearly is relatively recent (Dorsey 1906:8; Murie 1981:197). Indeed, older documents refer to this division of the Pawnee as the *Pani* and it is only in the latter third or so of the eighteenth century that the three South Bands become distinctly and specifically identified in the documentary record. This likely is a reflection of their emergence as separate bands only at that time. A single term that refers to the Pawnee as a collective of these four bands is even later (Parks 2001:545).

Evidence for the presence of the Kitkahahki band of the Pawnee in the Republican River valley comes from archaeology, historic records, including both documents and maps, and Pawnee oral history. The site was once believed to be the village visited by American Lieutenant Zebulon Pike in 1806. It was at that village where the Spanish flag was lowered and replaced by the American flag, signaling the American presence and forthcoming influence in the mid-continent. So sure were local residents that this village marked the location of Pike's historic visit, they erected a monument to this event upon the occasion of its centennial in 1906 (Anonymous 1908; Laugesen 2000). Although subsequent research overwhelmingly supports the identification of a site in southern Nebraska as the remains of the village Pike visited, the thought that Kansas Monument might be the site Pike visited led to its ownership by the State of Kansas. And even though it does not represent the remains of the site Pike visited, the Pawnee

Indian Village remains a significant site for several reasons. First, it is one of only four known Kitkahahki village sites in the Republican River valley (the Hill, or Pike-Pawnee site [25WT1] in Nebraska, the Shipman site [25WT7], an extension of the Hill site, and the Bogan site, [14GE1], in Kansas are the other three<sup>1</sup>); perhaps a reflection of the dominant occupation by the tribe in the Loup River valley of central Nebraska. Second, previous investigations at this site in 1949 (Smith 1949, 1950a, 1950b) and the 1960s (Witty 1968) revealed a rich archaeological record. This was reflected by in the presence of numerous artifacts, of both local manufacture and the result of Spanish, French, and American trade. Third, the archaeological record provides a view of an important interval during the contact period, in which objects of Native manufacture were being rapidly replaced by objects of European or Euroamerican manufacture. And fourth, a majority of the Pawnee Indian Village site is protected from unwanted destruction by its ownership by the state of Kansas and its status as a National Historic Landmark.

### **Previous Investigations at the Kansas Monument Site**

Previous investigations at the Kansas Monument site include planned and opportunistic excavations by professional archaeologists and surface collecting and perhaps some limited excavations by local amateurs. Remains of the Kitkahahki occupation are highly visible on the surface with numerous depressions (houses, pit features, portions of the fortification). While it may be impossible to reconstruct all types and dates of investigations at this site, we are aware of at least four substantial efforts. First, Floyd Schultz, an amateur archaeologist from Clay Center, Kansas, and George Lamb of Nebraska, conducted fieldwork on the south part of the site (south of the state owned land) during the early 1930s. Records associated with this work suggest that they investigated the remains of at least one lodge; however the amount of material recovered appears to be extremely limited. Second, the local Nystrom

family, owners of land adjacent to the state property, assembled a collection of artifacts that were later donated to the University of Kansas. This collection includes multiple trade items, metal projectile points, and items of local manufacture. In 1949, at the request of the State, Carlyle Smith, of the University of Kansas, excavated the remains of two lodges (Houses 1 and 2) (Figure 1) and tested the fortification trench in several locations (Figure 2). Smith's research interests in French trade guns and ceramic seriation as a means of documenting occupation periods, guided his limited reporting on the investigations (Smith 1950a, 1950b). Curated at KU, the collections includes lithic tools, ceramics, charcoal and plant remains, animal bone, shell, metal artifacts, gun parts, seed beads, and original documentation, maps, and photographs. Accession records at the University of Kansas also document the collection of surface materials from "the south portion of the site" in 1964 by several of Smith's graduate students. The impetus for this collecting is unknown.

The largest and most comprehensive investigations to date, however, were conducted by State Archaeologist Thomas Witty of the Kansas State Historical Society from 1965 to 1967. Witty excavated the remains of 9 lodges (House 3, 4, 5, 6, 7, 22, 23, 24, and 25). Pawnee Indian Village Museum subsequently was built over the in-place remains of House 5. Witty's investigations recovered a total of 29 cubic feet of materials, including artifact classes listed above and including decorated and incised bone tools, worked bottle glass fragments, woven grass matting, multiple types of metal tools and fragments, a large quantity of faunal remains, and many pieces of uncharred wood from lodge structural elements.

### **Research Goals**

The four primary research goals of this project include many sub-categories for research and are points from which more work can be generated. As discussed below, each research goal, or theme, includes a review of the current knowledge of each research theme and a





recommendation of a direction for further research. Technical details on how this research will be addressed are only briefly discussed, but will be the focus of additional reports as the project develops.

### *Chronology*

An accurate understanding of the site's chronology is a research problem in its own right and is fundamental to a satisfactory resolution of several other research problems concerning the Kansas Monument site. It must be a basic premise that we have *no* unambiguous documentary references to Kitkahahki occupation at this site (or any specific site in the Republican River valley) and with one possible exception (and that not for this site), archaeological investigations have derived *no* unambiguous dates using any class of material or dating technique. Thus, *all* assignments of dates of occupation are inferences, some of which are more firmly grounded than are others. Barring the unlikely discovery of some currently unknown document that provides a smoking gun, the lack of unambiguous historic references will always be the case. Ultimately, dating the time and duration of the occupation of this site must be done using archaeological methods. While this is dependent on validating associations and is always inferential, carefully thought out and theoretically justified approaches can produce highly credible results.

A useful preliminary step in establishing a chronology is to use available documentary data to develop a timeline of *possible* dates of occupation at this site (Figure 3). These data, as assembled by Roper (2006:234–238), are a timeline for *Kitkahahki occupation at villages in the Republican River valley in general*. However, residence at the Kansas Monument site in specific must either coincide with or be a subset of the Republican River valley chronology. Thus, the timeline sets some temporal parameters for the Kansas Monument site that can be used in assessing the credibility of the inferences from archaeological materials and in helping us to think about factors

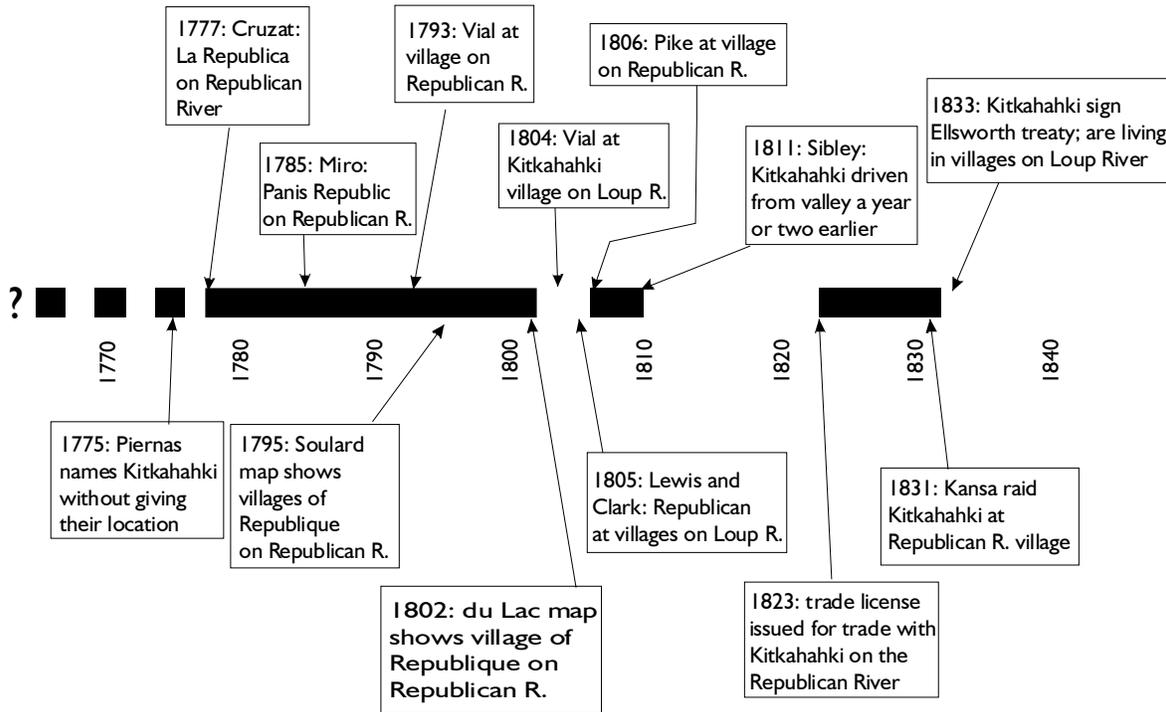
relevant to other research problems that are dependent on the chronology.

The earliest relevant documentary reference is the 1777 report by Cruzat, the lieutenant governor of the Louisiana, which identifies the “La Republica” (i.e., the Republican, or Kitkahahki) as living along the Republican River (Houck 1909:143). This document, while not the first to mention the Kitkahahki by name, was the first to put them in a location, and therefore serves as a *terminus ante quem* for occupation in the valley. How long the Kitkahahki had already been there is uncertain. It probably was less than two decades, for a 1758 report by Kerlérec seems to imply a location other than the Republican River valley and may serve as a *terminus post quem* for the occupation in that valley. Kerlérec (Nasatir 1952, I:52), in fact, did not distinguish the Kitkahahki by that name and it is possible that the three individual South Bands were not yet differentiated from one another at that time—the Kitkahahki name appeared in the documents for the first time only in 1775 (Kinnaird 1949, I:228), without any indication of location, and the specific names of the other two South Bands first appear around the same time. The movement of the Kitkahahki to the Republican River valley may correspond to the time of differentiation of those three bands from their *Kawahahki* antecedent. This appears to have happened in the latter third or even quarter of the eighteenth century (Roper 2006:245–246).

A few documents attest to continuing Kitkahahki presence in the Republican River valley until the end of the eighteenth or beginning of the nineteenth century. In addition to occasional listings in administrative reports or trade lists, in 1795, Soulard, the surveyor-general at St. Louis, published a map (Wood 1996) that showed three “Republic” villages along the Republican River. An 1802 map by Perrin du Lac (Wood 1983:Pl. 9) also shows the Republic along the Republican River.

The Kitkahahki left the Republican River valley sometime around 1800 (the du Lac map is not necessarily evidence that they still were there

*Timeline of the Kitkahahki in the Republican River Valley*



*Figure 3. Timeline of the Kitkahahki Occupation in the Republican River Valley*

in 1802). Vial reported them in villages on the Loup River in Nebraska in 1804, as did Lewis and Clark in 1805 (Moulton 1983–2001, 3: 350). They had returned by 1806, for it was in the fall of that year that Lt. Zebulon Pike was in a Kitkahahki village on the Republican River. This was a short period of residence, however, for in 1811, Sibley (Brooks 1965:180) reported that they had been raided by the Kansa and had returned to the Loup River valley a couple years earlier. This time they stayed in the Loup River valley for over a decade, returning to the Republican River valley in or about 1823. They remained there until the Kansa again raided them in 1831. Sometime between then and fall 1833, they again left the Republican for the Loup. In 1833, they signed the Ellsworth treaty (Kappler 1904:416-418). This treaty lists them as residing in villages along the Loup River. By the Ellsworth treaty, the

four bands of the Pawnee ceded all lands south of the Platte River. The Republican River lands obviously were part of this land cession, and the Kitkahahki never returned to the valley.

The Kitkahahki thus were located in a village or villages in the Republican River valley in the period from somewhere before, although perhaps not long before, 1777 to no later than 1803 and possibly a few years before that. A few points on the timeline may refer to occupation at the village represented by the Kansas Monument site. Cruzat’s 1777 report indicated that the Kitkahahki were about 110 leagues, or 286 miles, from the Missouri River. In 1785, Miró, Cruzat’s successor as lieutenant governor, reported the Kitkahahki as 130 leagues, or 338 miles, above the Missouri River (nasatir 1952, I:126). A modern measurement from the Missouri River upriver to the Kansas

Monument site, using the 2.6-mile league, is 368 miles (142 leagues). The distance to the Hill (and Shipman) site is 415 miles, while that to the Bogan site is 243 miles. None of these match the historically reported distances, but of the three, Kansas Monument certainly most closely matches the modern distances reported by both Cruzat and Miró, particularly when we consider that we do not know how the historically reported distances were measured or the exact route they were following.

Following the course of Vial's 1793 journey (Loomis and Nasatir 1967) suggests that of the known Pawnee villages in the Republican River drainage, either Kansas Monument or an unknown site nearby best fits the distances, both from the mouth of the Little Nemaha River to the village and from the village to the Arkansas River, that he reported when he passed through a Pawnee village on his way from St. Louis to Santa Fe (Roper, unpublished manuscript). The 1795 Soulard map clearly shows three "Republique" villages in the Republican River valley. Lewis and Clark, in their 1805 report on villages in the Missouri River drainage, also mentioned that the Kitkahahki had occupied multiple villages when they resided on the Republican River. The Kansas Monument site village almost has to be one of these.

While the Kitkahahki clearly were in the Loup River valley in 1804 and 1805, they even more clearly were again in the Republican River valley in 1806 when Pike came through the area. The question is whether the Kitkahahki had re-occupied all the villages they had lived in during the 1790s. It is clear from several lines of evidence, including peace medals (Munday 1927: 187) that the Republican River village the Pike expedition entered was that represented by the Hill site in Webster County, Nebraska (this is the one piece of archaeological evidence that is, for all practical purposes, unambiguous in providing a date for occupation of a specific site). However, neither the 1806 records nor any subsequent villages on the Republican River mention how many villages the Kitkahahki occupied at that time. Thus while

simultaneous occupation of the Kansas Monument and Hill sites is not supported by documentary evidence, the evidence is so silent on the matter that simultaneous occupation also is not precluded. Nor are any documents from succeeding years specific enough to identify the village referred to or even determine how many villages were occupied.

In sum, then, several lines of documentary evidence suggest the Kansas Monument site *might* have been occupied in the period from slightly before 1777 (but not as early as 1750 as some would suggest) to the first years of the nineteenth century. The evidence is particularly strong for occupation of this village in the 1790s. A goal of establishing the site chronology should be to determine if this village was founded when the Kitkahahki first occupied the Republican River valley or if it represents a village founded in subsequent years, perhaps during the division Lewis and Clark mention (Moulton 1993-2001, 3:398). A second period of Kitkahahki occupation in the valley was 1806 to 1810 ( $\pm$  a year or two). It is as good as certain that the Hill site was occupied at this time, but even without clear documentary evidence that the Kansas Monument site was occupied too, there also is no reason that it could not have been. The third and final period of Kitkahahki occupation in the Republican River valley is 1823 to about 1831/1833. How many villages there were and which ones were occupied is unknown, meaning that, in principle, Kansas Monument *could* have been occupied during that period. It seems pretty obvious that Kansas Monument was occupied for all or part of the 1777–1800 period of Kitkahahki occupation in the valley. Another goal of establishing the site chronology, however, should be to determine if it also was occupied during these second and third periods of occupation in this valley.

### *Subsistence*

The Pawnee are described in the literature (Wedel 1936:57) as having a food complex centered on bison and maize. While these foods are certainly representative of the fact that both

hunting and farming contributed to the economy and that both bison and maize are indeed present in sizeable amounts in the excavated assemblages, the full extent of the foods selected, farmed, or gathered is largely unknown. The lack of any fine screening (either dry or wet screening or flotation) for the recovery of plant remains and small sized faunal remains certainly contributes to this. However, equally important are the facts that existing collections have not been fully identified so as to be useful in knowing what other animals and elements are represented and in what quantity, or knowing what plants have been recovered, the characteristics of the maize, and the various wood species used for different purposes.

The best approach to a more comprehensive understanding of Pawnee, and particularly Kithakahki, subsistence involves collaborative efforts and attention to both curated and newly excavated assemblages. Published information, and recent analyses of both floral and faunal collections, offers baseline information regarding hunting practices, farm crops, and the importance of wild plants. Wedel (1936) reports the presence of bison, elk, deer, canid, dog, and horse from the Hill site in Nebraska. Wood (1977) provides a list of faunal remains from Witty's excavations and expands the list to include beaver, raccoon, cottontail, turtle, and meadowlark. Volmut (2007) recently analyzed the faunal collection from Carlyle Smith's excavations of Houses 1 and 2 at the 14RP1 and provides similar information. His analysis demonstrated that the majority of the animal bones in the collection are from bison (*Bison bison*), canid (Canidae) and deer (*Odocoileus virginianus*). Also represented are beaver (*Castor canadensis*), elk (*Cervus canadensis*), domesticated horse (*Equus caballus*), raccoon (*Procyon lotor*), pronghorn (*Antilocapra americana*), black bear (*Ursus americanus*), turkey (*Meleagris gallopavo*), and a single mussel shell (*Lampsilis* sp.).

Floral collections from excavated Pawnee sites tend to be dominated by remains of maize, both cobs and kernels. Wedel (1936:59-61) includes a report from Melvin Gilmore on the plant

remains recovered from the Hill site. The majority of the collection was maize, but squash, beans, and pumpkins were also present. Corn varieties from the Hill site are described as small in diameter and having from 8-12 and 14 rowed kernels. Also recovered were wild potato (*Pisoralea esculenta*), chokecherry (*Prunus virginiana*), plum (*Prunus americana*), Jerusalem artichoke, sand cherry (*Prunus* sp.), grape (*Vitis* sp.), and goosefoot (*Chenopodium* sp.). Adair (unpublished notes) provides additional information regarding the maize, based on an analysis of some of the maize cobs from Witty's excavations at 14RP1. The analysis of cobs (n= 53) from House 3 and 6 suggests that several varieties were grown. Row number includes 8, 10 and 12 rowed varieties, with cob diameters ranging from 11.9 to 22.6mm, suggesting the presence of large cobs. Cob shape varies from round to oval to square and the rows often exhibit evidence of pairing. Adair also analyzed botanical remains from several Pawnee burials prior to repatriation (Adair 1990). Sites included in this study were 25WT1, 25BU1, 25SD2, 25PT1, 25PT31, 25PK1, 25NC1, 25BU4, and 25SD31. In addition to maize, remains of beans, squash, watermelon, and gourd were noted. The presence of watermelon is a good indication of trade with either the Southwest or the Southeast, as this food was introduced into North America by the Spanish in the mid- 1500s (Blake 1981). Watermelon has also been identified at the El Quartejejo site (14SC1), dating to the early 1700s (Adair 2006). A cursory examination of the 14RP1 botanical collections at the KSHS suggests that more can be learned of the maize by the analysis of individual maize kernels. A significant quantity of what appear to be the common bean (*Phaseolus vulgaris*) was also noted. A single peach pit was also in the collection, and if associated with the Pawnee occupation, also represents a Euroamerican influence through either trade or direct contact. Peaches were among several fruits and vegetables brought to missions in the Rio Grande River Valley by the Spanish (Lopinot 1986) in the sixteenth century.

There is no doubt that new recovery techniques will enhance our understanding of Pawnee economy by specifically adding a size category of faunal remains, small seeds and other plant parts to the total assemblage. Fine scale recovery is critical to answering questions related to both subsistence and to the economy. For example, fish are currently not represented in any faunal inventory, but would have been a reliable and accessible food source and could have made a significant contribution to the diet. On the other hand, documentary or ethnographic evidence for fishing is lacking. In regards to farm crops, by the late 1700s different varieties of squashes were dispersed out of the Southwest and could have been added to any existing agricultural endeavor.

Reconstructing the economy, however, includes more than an identification of recovered floral and faunal remains. The possession of horses would have impacted the distribution of various foods and how resources were being used. Given the time of occupation, the Pawnee economy was changing from one of purely subsistence to one involving trade. Trade may have had a significant impact on the volume of various foods being available and may account for the presence of select foods in the archaeological record.

The selection and use of available wood species and grasses must also be a part of the “subsistence” research theme. Pawnee mythology includes the selection of different woods for lodge construction, but whether this is evident in the archaeological record has not been addressed. Farming may have also depleted stands of trees, requiring the occupants to select lesser quality or less preferred species for specific purposes. Wood identification, contextual associations, and knowledge of Pawnee mythology may combine to address some of these issues.

### *Trade and Interaction*

The late 18<sup>th</sup> and early 19<sup>th</sup> centuries represent a dynamic period in Pawnee history. Direct contact with Euroamericans was becoming more regular and changing in character and

intensity. Pawnee perception and understanding of the behaviors and goals of Euroamerican traders, missionaries, and explorers began to change dramatically during this period. Increasingly, the Pawnee recognized these early Euroamericans to be simply humans with new technology rather than magical and more powerful others (cf. Rogers 1990). The traditional trading and interactions, both cooperative and hostile, among the Pawnee and other native groups also changed dramatically during this period. Competition for new traded technologies including horses, guns, metal tools, beads, containers, new foods, status markers and social connections resulted in rearrangement of alliances and the nature of interactions among groups. Depopulation as a result of introduced diseases also impacted these relationships and the internal organization of Pawnee peoples as well. The role of the fur trade, which opened many avenues of interaction, but which was ultimately somewhat mercurial and dependent upon the Euroamerican demand for furs and hides, was a key element in the changing Pawnee culture of this period. The role of the horse as an item of trade, interaction, and status, and as a technological asset for transporting other trade materials was revolutionary in terms of economic impact, mobility, and social change. The roles, status, and power of individuals, groups, and genders changed as access, control, use and display of trade materials and trading alliances changed. Transformation of Pawnee material culture and the changing roles of material items, in terms of status, personal and group identity, function, and symbol systems very likely reflects changes, which were occurring in Pawnee culture (cf. John 1975; Rogers 1990). We assume that the detailed study and documentation of trade materials, both those of native origin and of Euroamerican origin, will yield insights into the nature, cadence, and overall character of Pawnee cultural change during this period in Pawnee history.

For these reason, a multifaceted investigation of trade via the material record of trade indicators is a central concern of this

investigation. Trade and interaction with diverse groups and at multiple scales can be assessed through study of botanical remains including indigenous crops and traded foods potentially including watermelon and peaches; animal products including hides, meat, and fat as evidenced by detailed study of faunal evidence; stone artifacts as indicated by types of tools and sources of materials; ceramic artifacts as expressed by vessel forms, technology, decoration and overall design; metal artifacts as indicated by type, frequency, recycling and correlation with changes in stone and ceramic technologies; beads and other Euroamerican materials which served in roles of ornamentation and status markers; and in the overall changes in the frequency and composition of the material culture and ecofactual evidence. Additionally, the village structure, architecture, household composition, village location, defensive works, duration of occupation, and evidence for reoccupation will all reflect on the internal structure of Pawnee society at the time as well as their relationships with other native and foreign cultural groups.

#### *Pawnee Social Structure*

Roper (2006:245–246) provides a discussion of the separate origins of the South Bands and the Skiri divisions of the Pawnee, and the differentiation of the three South Bands in the eighteenth century. Roper was following several lines of evidence in discussing this, including Dorsey's (1906:8) discussion of the origins of the individual South Bands and their movements to their historic positions at the time of their differentiation. This certainly is an interesting research theme; however, it is not too likely that investigations at a single site will go far in addressing it. As discussed under the Chronology theme, the project will seek to approximate the date at which Pawnee Indian Village was established and first occupied and note that it may correlate closely with the first specific mention of the Kitkahahki and other individual South Bands. A good date will hardly be definitive but any valid

historical scenario must not be contradicted by external chronological evidence and a good date would at least not contradict the postulated relations and might even be supportive of it.

The potential antecedent relationship between the Great Bend aspect of central Kansas and the South Bands is a reoccurring topic that deserves some attention. This project will be continuously seeking comparisons of the Kansas Monument site material with that from other sites and other cultural complexes, undoubtedly including Great Bend, particularly the Little River focus of the Great Bend aspect. It should be noted however, that there is a significant time offset between the end of Great Bend in Kansas, ca. 1700 if not before, and the time of occupation of the Pawnee Indian Village. This is a time of considerable change that might blur any comparisons. Further, the Kawarahki tradition has them differentiating from a location in Nebraska, thus adding a further step that will blur identities. The best strategy will be to conceive of the Pawnee Indian Village study as establishing a baseline against which future comparisons can be made with Great Bend, the eighteenth century Wichita villages in north-central Oklahoma (Bryson-Paddock in particular, a site that currently is under investigation by archaeologists from the University of Oklahoma), and the Pawnee villages in Nebraska, for which little recent work has been done but from which are voluminous curated collections.

#### **Proposed Methodologies**

Collaboration among the State, the Kansas Anthropological Association, and the University of Kansas, will enable new investigations that will focus on current and innovative research topics. Current excavation procedures will allow for the recovery of many classes of objects that were not collected in previous investigations. Site chronology will be addressed using a variety of approaches, microstratigraphy will be assessed for insights into use or reuse of living areas, and other pertinent issues will be addressed. A team of

professional archaeologists, graduate and undergraduate students, and researchers at various institutions will analyze the artifact assemblages and will collectively provide a comprehensive report on the existing collections and those recovered with the 2008 excavations.

There is no doubt that the excavation and analyses of recovered materials from the Pawnee Indian Village will require a team of experts. The project co-Principal Investigators are Mary Adair, Jack Hofman and Donna Roper, who will be involved in all aspects of the project in appropriate detail but who will also have specific responsibilities related to their individual expertise. Jack Hofman will be responsible for the lithic assemblage (chipped and ground stone tools), large faunal remains, bone tools, and shell. Donna Roper will be responsible for the ceramics assemblage, ethnohistory research, architecture, and Pawnee social organization research. She will also serve as the Field Director for the summer fieldschool. Mary Adair will serve in an administrative capacity (supervising students, working with project consultants, and maintaining the budget) and will also be responsible for seed, maize, plant, and wood identification. She will work with the Missouri Tree Ring Laboratory, Department of Forestry at the University of Missouri should dendochronology samples be submitted. Students will be an integral part of this project, with the hope that exposure to this site and to the collections will generate additional interest in the late prehistory/early history of the central Plains. Beyond that, students will make a significant contribution to the successful completion of this project and will function in several key positions in both the field and the lab.

Seven individuals will serve as project consultants. Included are Rolfe Mandel who will provide an assessment of the site's geoarchaeology, stratigraphic positioning, and buried soils. He will also be responsible for the collection of micro-morph samples and preparation in the lab for thin sectioning. Thomas Witty, as the former State Archaeologist, was responsible for the excavation

of the 7 mud lodges in the 1960s. Mr. Witty will serve in an advisory capacity by responding to questions regarding excavations and records. The Pawnee Nation (exact individual to be identified by the tribe) will be included in the team. According to Francis Morris, Pawnee oral histories focus on ceremonies and beliefs and rarely include information of the daily life. Archaeological collections can provide information, often detailed, on the daily life, such as the subsistence, ceramic manufacture, and raw material procurement strategies. Stacey Lengyel of the Illinois State Museum will serve as the analyst for any archaeomagnetic samples collected and analyzed. Paul Goldberg of Boston University will analyze the micro-morphology samples collected to reveal micro-stratigraphy. Byron Sudbury is a critical member of the team in that his identification and analysis of the various trade materials (metal tools and metal pieces, beads, and glass) will enhance the chronology questions. John (Rob) Bozell will assist the project with the identification and interpretation of the fauna. He will focus on the small sized remains, including those recovered with flotation.

For practical purposes, the project can be conceptualized as involving three phases. Phase I focuses on an inventory of existing collections and is currently in process. As part of the inventory, the initial construction of a comprehensive map, using GIS software, will be constructed. Phase II is the fieldwork portion that is planned for May and June 2008. The KATP field season is scheduled for a 16-day period (May 31–June 15), and the KU field school for 10 days (June 4-13), with field attention focused on one mudlodge, several external features, and the fortification wall. Other activities that will occur during the field season include securing special samples (archaeomag and micro-morphology), washing and cataloging of the excavated materials, and in-field photography of features and stratigraphic profiles. The final phase is the comprehensive analysis and reporting. This phase will involve the final preparation, cataloging, and inventorying of excavated materials and a wide

range of specialized analyses pertaining to these and to previously excavated materials. This work will begin at the conclusion of the field investigations and will continue until the final report is completed and submitted.

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### (Footnotes)

<sup>1</sup> A century ago, E.E. Blackman (1907:349-350) hinted that another site might lie a couple miles up the river from Kansas Monument. Roper, with Richard Gould and Ryan Klute visited the location Blackman described in January 2003. They did record a site there (14RP326; Roper 2002) but found no pottery or other diagnostic artifacts, so cultural affiliation remains unknown. Still, the landowner has definite Lower Loup/Pawnee pottery that he avers is from this location. Further investigation is necessary to determine whether or not there really is a fifth Pawnee site in this valley.

*Archaeology at Kansas State University, 2006-2007*

**Brad Logan and Lauren W. Ritterbush  
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Several projects and technical reports were completed by the authors during the past two years and the abstracts of the latter are presented here. One report appeared under the project report series of the University of Kansas, Museum of Anthropology, now the Archaeology Research Center; all others are the result of various projects undertaken by personnel from Kansas State University since 2004, some of which have been the subjects of preliminary papers in previous issues of CAK. All reports are on file at the respective universities, as well as at the Historic Preservation Office, Kansas State Historical Society. Reports submitted to the Nebraska-Kansas Area Office, Bureau of Reclamation are on file at that agency as well.

*The Montana Creek Sites: Archaeological Investigations at Lovewell Reservoir, Jewell County, Kansas-2004*, by Lauren W. Ritterbush and Brad Logan. (May 2006)

National Register of Historic Places (NRHP) evaluation was conducted at selected sites at Lovewell Reservoir, Jewell County, Kansas, in fall 2004 through cooperative agreement (No. 03FC601867) between the Bureau of Reclamation (BOR) and Kansas State University (KSU). The three sites were targeted for evaluation: 14JW46 (Montana Creek East), 14JW47 (Montana Creek West), and 14JW48 (Phil). This report summarizes an evaluation of 14JW46 and 14JW47 in the Montana Creek locality and additional survey of nearby lands. (A separate report is being prepared for 14JW48 to summarize both NRHP evaluation and mitigation of that site.) This report also presents information about newly recorded sites 14JW50, 14JW51, and 14JW52 and seven isolated find spots.

Investigations at 14JW46, Montana Creek East, revealed an exposed surface component with numerous bison bones, as well as ceramic and lithic artifacts. Surface survey, mapping, test excavations, and analysis of artifacts in the Eckles collection indicate this site holds significant new information and is deemed eligible for the National Register of Historic Places (NRHP). Two components are present. The upper likely dates to the Late Prehistoric or early Protohistoric period and was a late summer camp of bison hunters who schlepped selected marrow-rich bones to this site. The identity of these hunters remains uncertain, but does not appear to be Central Plains tradition (CpT) or White Rock Oneota. A buried component reveals the first documented evidence for Woodland-period use of this locality. Given the adverse impacts associated with annual inundation and exposure, we recommend 14JW46 be extensively excavated to mitigate these effects on remaining cultural materials and their context.

Site 14JW47, the Montana Creek West site, has a surface component with similar bison and cultural remains. Based on previous discoveries by Dick and Phil Eckles, tools and materials suitable for future use were cached there. Among their finds is a very large Oneota pot found with an ax and probable scapula hoe. This pot suggests use of the site by migrant Oneota peoples. Limited excavations in 2004 revealed a shallow surface component and no cultural materials in the buried soil identified at nearby 14JW46. Due to the limited quantity and dispersed nature of finds, this site has not been recommended to the NRHP. Nonetheless, archaeological survey should continue to monitor and document the impacts of fluctuating water levels and future archaeological finds at this site.

Surface survey east of 14JW46 along the north

shore of Lovewell Reservoir resulted in the definition of a new site, 14JW52, and three isolated finds. NRHP evaluation is recommended for 14JW52, a surface scatter of bison bones and artifacts. Finds spots FS 2004-7 and 2004-9 should be monitored during low-water levels for additional finds. No further work is recommended for FS 2004-8. A portion of the south shore of Lovewell Reservoir was also surveyed, resulting in discovery of 14JW50, an artifact scatter with a scapula hoe, chipped stone tool and toolstone cache; 14JW51, a light scatter of varied cultural materials; and four isolated finds, each of which consisted of a single artifact or bison bones. The latter require no further work. NRHP evaluation and continued survey during low water are recommended for 14JW50. This and other sites in the Lovewell locality (e.g., 14JW5, 14JW47, 14JW52) promise to provide insight into caching behavior by prehistoric peoples. 14JW51 should be monitored for additional finds.

*Geoarchaeological and GIS Modeling of Archaeological Site Locations at Kirwin National Wildlife Refuge, Phillips County, Kansas*, by Brad Logan, William C. Johnson, and Joshua S. Campbell. University of Kansas, Museum of Anthropology, Project Report Series No. 105. Report submitted to the Bureau of Reclamation Nebraska-Kansas Area Office Grand Island, Nebraska. (August 2006)

The report describes the results of a systematic, surface archaeological reconnaissance and geoarchaeological survey of Kirwin National Wildlife Refuge by the Museum of Anthropology, University of Kansas. The project area is in Phillips County, Kansas, on the North Fork Solomon River, a tributary of the Smoky Hill River through the Solomon River. The project was undertaken through a cooperative agreement with the Nebraska-Kansas Area Office, Bureau of Reclamation. The initial goals of the investigation were: to inventory the cultural resources of all lands not inundated by the reservoir, to report on their extent, nature, function, and temporal/cultural

affiliation, and to make recommendations for further investigation of those that might yield evidence sufficient to warrant their consideration for placement on the National Register of Historic Places. Archaeological survey was done for a few weeks each summer from 1999 to 2002. A geoarchaeological component was added in 2001. It included Geographic Information Science (GISc) modeling of geomorphic and archaeological data in order to predict the geomorphic context of potential cultural resources and to track the effects of water level changes in various landforms that might contain them.

Thirty-three sites were encountered during the surveys, two of which had been previously recorded. Sixteen of these contain prehistoric components. None of the historic sites recorded during the survey, all of which date to the late nineteenth century or first half of the twentieth century and reflect the regional rural economy of that time, is recommended for further investigation. Some of these consist of isolated features, such as water tanks, troughs, or cisterns; a few are razed farmsteads. All of the historic sites lack architectural integrity and are not known to have been associated with a person of historical significance. Most of the prehistoric sites are light lithic scatters or isolated flakes of the near-locally available Niobrara jasper, a raw material valued by regional cultures for the production of chipped stone tools. Only two prehistoric sites are recommended for National Register of Historic Places evaluation. 14PH17 yielded a relatively moderate amount of cultural material that is suggested to date to Late Prehistoric time. The West Island site (14PH10), was previously recorded and during its initial investigation by the Kansas State Historical Society in 1963 it yielded a variety of artifacts and human remains of the Plains Woodland (Keith variant) period. Although no evidence of the site was found during the KUMA investigations, the buried soil that contained them in 1963 was rediscovered and radiocarbon dated. It is likely that some evidence of the site remains in this horizon, which is currently below the floodplain of the reservoir and, at normal flood pool, is below water. Additional survey is recommended for 14PH44, a prehistoric site a short distance below the dam that

has been impacted by road construction. No diagnostic artifacts were found there, but such may be revealed through more intensive shovel testing.

A synthesis of archaeological, geomorphic, and GIS data provides the basis for a cultural resource management plan for the KNWR. This approach is valuable for predicting the location and context of prehistoric sites. Buried soils range in depth from 1m to more than 4m and date from 3060±70 to 550±70 rcybp. These ages correlate with the Late Archaic, Woodland and Late Prehistoric periods. The depths of the soils preclude site discovery through traditional survey methods, including shovel testing to depths of 30-50cm. The GIS component of the synthesis demonstrates the vulnerability of cultural resources in the project area, including any associated with buried soils, to fluctuating water levels of the reservoir.

[Note: This report includes a CD with two animated 3D visualizations produced by Campbell, who describes them as follows: “Both animations use 1991 imagery overlaid on a Post-Dam DEM [illustrated in the report]. In the first animation (Kirwin Fly-by /kFlyby) the camera essentially rotates completely around the study area at an oblique angle; water levels in the reservoir are also animated and fluctuate from the top of the conversation pool (1730ft) to the historic low (1695ft) to the historic high (1737ft) and back to a standard conservation pool (1725ft). This animation is 40 seconds long and is composed of 1000 rendered frames. In the second animation (Kirwin Water Level/kWater) the camera is in a stationary oblique perspective located just left of the center of the dam; only the water level is animated. In this 60-second (1200 frame) animation the water levels in the reservoir follow the yearly maximum elevation values that are displayed [graphically in the report]. At five seconds the reservoir is filled to the 1953 level and each subsequent second of the animation represents one year’s maximum value. While this animation does not account for within-year variations in water level, it does provide a reliable perspective on the

changes in spatial extent of the reservoir over time... The animations are formatted in a Windows Media Audio/Video (.wmv) format that should play on most computers running a Windows operating system and Windows Media Player.”]

*Phase II Cultural Resources Survey of the Heritage Square North Development Area, Pottawatomie County, Kansas*, by Brad Logan. Report submitted to Midwest Concrete Materials and BG Consultants, Inc. (September 2006)

*Phase III Cultural Resources Evaluation of the Heritage Square North Development Area, Pottawatomie County, Kansas*, by Brad Logan. Report submitted to Midwest Concrete Materials and BG Consultants, Inc. (November 2006)

These reports describe the results of investigations at a tract of land to be affected by bank stabilization along the south side of a reach of the Blue River that will protect a development called Heritage Square North. The projects were instigated by an application for a permit from the U.S. Army Corps of Engineers that prompted Section 106 compliance. The tract, an area of ca. 7.3ha, was known to contain one previously recorded site, 14PO402, described by Patricia J. O’Brien in 1969 as containing “a scatter of chert debris”. Survey by a team of three persons during Phase II survey in September 2007 relocated the site in two distinct areas, called Areas A and B. Fourteen undiagnostic pieces of chert debitage were mapped with a GPS receiver and recovered in the former and 30 artifacts, including 27 chert flakes, a piece of burned limestone, and a small body sherd, were mapped and collected at the latter. One flake was found in slumped soil at the base of the cut-bank along the Blue River and was believed to have eroded from Area A, which is immediately adjacent to the bank at the find spot. Phase III evaluation was recommended.

Phase III investigation entailed excavation of test units in both areas by a team of five persons under the author’s direction on October 27-28, 2007. The

locations of surface finds from the Phase II investigation, still marked by pin flags, were mapped more precisely with an EDM. One 1x1m test unit was dug to a depth of 40cm in Area A and only the plow zone yielded artifacts, just five pieces of debitage. Two test units, each 1x1m, were dug to depths of 60 and 50cm in Area B. TU1 yielded 49 artifacts, including six very small body sherds; TU2 contained only a dozen lithic artifacts. In neither unit were artifacts found in significant numbers below the zone of agricultural disturbance.

Given the paucity of cultural material, its limited nature, and the lack of features such as hearths or storage pits, it is suggested that 14PO2 was a short-term encampment (or two) where activities included maintenance of chipped stone tools and, in Area B, the use of pottery. Given the few sherds recovered, affiliation with a specific culture is uncertain, though the Central Plains tradition is considered likely. Given the low number of artifacts, their disturbed context, and uncertain affiliation, the site did not possess the qualities required of a potentially significant site. For those reasons, clearance of the bank stabilization project was recommended.

*National Register of Historic Places Evaluation of the New-McGraw Site, Stranger Creek Valley, Northeastern Kansas*, by Brad Logan, with contributions by Eric Skov and Mitchell Frye (March 2007)

The New-McGraw site (14LV601) is a single component, Plains Woodland (AD 500-1000) occupation in Stranger Creek valley, Leavenworth County, northeastern Kansas. It was discovered in June 2005 following severe flooding and reported to archaeologists from Kansas State University that month by Mike and Travis McGraw, father and son, farmers who work the field in which it is located. The field is owned by Damon and Brandon New, who consented to have the site surveyed and, when it proved worthy of more intensive investigation, excavated by the Kansas Archaeological Field School (KAFS) in June 2006. The purpose of the

investigations was to determine the site's eligibility for nomination to the National Register of Historic Places. Toward that end a grant from the Historic Preservation Fund was awarded to KSU by the Kansas State Historical Society.

The site is located on the floodplain of the valley and evidence of its vulnerability to over-bank flows from Stranger Creek is a series of three shallow, eastward draining washes that cross the entire site. Hundreds of pieces of chipped stone debris, pottery sherds, and pieces of fire-cracked rock lay exposed as a lag deposit in the western half of the central wash. More sparse specimens of the same material were scattered across the field in other low-lying areas, including a meander scar that marked the southern edge of the site. Cord-marked, densely grit-tempered sherds, corner-notched projectile point/knives, and Scallorn arrow points attest to its Plains Woodland affiliation. A small sample of charcoal, which was very scarce at the site, returned an AMS radiocarbon date of 1110+35 rcybp (OS-58082), d13C -24.53. Calibration (Calib 5.0.2) yields a two-sigma range of AD 828-1017, with 99% of the probability distribution in a tighter range of AD 866-1017. The one sigma (68.3%) range of AD 894-977 suggests site occupation occurred during the last century of the Plains Woodland period, perhaps just prior to Late Prehistoric development in the region.

KAFS investigation of the site entailed surface survey and topographic mapping with an Electronic Distance Measure Total Station, intensive surface collection from a grid of 272m<sup>2</sup> in the area of greatest artifact density, test excavation of units totaling 10m<sup>2</sup>, and excavation of a small block 21m<sup>2</sup> adjacent to the grid on its northern side. The purpose of the test and block excavations was to determine the vertical extent and contextual integrity of cultural deposits. All test units and the block units yielded relatively sparse artifacts from what appears to be the periphery of the area where most of the prehistoric activity occurred, by chance, that which had been most adversely impacted by flood scouring.

Based on analyses of the spatial distribution of cultural material and of the ceramic and lithic

assemblages, it is suggested that New-McGraw was a short-term, perhaps seasonal, camp. Activities included food preparation and cooking, chipped stone tool production and maintenance, and use of hearths. Analysis of chert raw materials indicates primary use of Plattsmouth chert, a local stone, and to lesser extent the utilization of Toronto, Winterset, and secondary cherts. It is suggested that Toronto chert, though preferred for its homogeneous texture and known to occur in outcrops in the Stranger Creek watershed, must have been procured from sources more distant than Plattsmouth. The site is suggested to have been close to a source of secondary chert, which occur as smaller gravels and are less workable than bedrock cherts, given its relative frequency as tools and debitage. The greater distance to sources of Winterset chert, which occur not in the watershed but several miles to the east, is exemplified by the extensive reworking of chipped stone tools and the scarcity of chipped stone debris of that material. No features such as hearths or storage pits were found nor was evidence of a lodge discovered.

National Register of Historic Places nomination is not recommended for the New-McGraw site. Despite the presence of an extensive artifact assemblage, erosion has severely impacted its stratigraphic integrity and, therefore, limited its research potential and significance.

*Windmill Creek: National Register of Historic Places Evaluation of a Central Plains Tradition House Site Lovewell Reservoir, Jewell County, Kansas-2006*, by Brad Logan, with contributions by Lauren W. Ritterbush, Kendra B. Kobiskie, and Katherine R. Ross (August 2007)

The report describes the results of Phase III investigation of the Windmill Creek site, a Central Plains tradition habitation at Lovewell Reservoir, Jewell County, Kansas. The investigations were undertaken in order to evaluate the property for its eligibility for nomination to the National Register of Historic Places. Intensive surface collection and surface artifact mapping indicated the site extends over

an area of ~900m<sup>2</sup> and surface artifacts included many potsherds, a smaller number of lithic artifacts, fire-cracked rock, daub, and bone. Test excavation of 16 1x1m units in four areas revealed very shallow cultural deposits (~5cm). Two of these revealed post molds, both within four to six meters of a third feature, a trash-filled storage pit. The latter contained a few sherds and lithic debris as well as hundreds of highly fragmented bones. The latter are indicative of bone grease processing of rather randomly selected elements of bison and deer (as well as one of canid). All evidence points to the presence of a lodge, one that may be similar to that exposed at the nearby (~400m) Phil site, another CPt habitation opposite Windmill Creek to the east. A single AMS radiocarbon assay of 760±30 rcybp (OS-58272) calibrates (Calib 5.0.2) to a two-sigma range (95.4% probability) of AD 1220-1283, statistically the same as the radiocarbon date from Phil.

Because Windmill Creek contains extensive cultural remains and the potential for other intact features, as well as the remainder of a lodge floor, it will provide additional insight to the activities of CPt groups along White Rock Creek, as well as the timing of their abandonment of that valley. Although the site has not yielded evidence of contact with groups of the White Rock phase, attributed to immigration of western Oneota groups ca. AD 1300, it is ~300m from the White Rock site and may yet reveal evidence of interaction with those immigrants. Finally, the site has only recently been exposed by long-term planation of Lovewell Reservoir and is now extremely vulnerable to continued wave erosion from fluctuating lake levels. Mitigation is strongly recommended. For these reasons, it is recommended for nomination to the National Register of Historic Places.

### *Alma Sewage Lagoon*

*Donna C. Roper*

*Phase II and III Archaeological Investigations for the Wastewater Treatment Facilities Improvements Project, City of Alma, Wabaunsee County, Kansas.* Donna C. Roper. Report to the City of Alma, Alma, Kansas. 2007.

The City of Alma, in Wabaunsee County, is adding a new sewage lagoon cell to their existing wastewater treatment system. This facility lies on a Holocene terrace in the Mill Creek valley. The landform is equivalent to that of the lower components of the Claussen site (14WB322) about 4 miles downstream between McFarland and Paxico. A Phase II survey conducted in March and April 2007 revealed a scatter of prehistoric debris on the slope of a broad gully eroded into the terrace. This site is numbered 14WB102. Ground surface visibility was absolutely 0%—the site was found by shovel testing. Debris, consisting entirely of unmodified lithic debitage, was recovered from multiple shovel tests at each of two loci. It was suspected, however, that all debris probably came from a single site and, given the fact that the two loci were at the same elevation, the possibility had to be considered that the debris was from a cultural horizon buried in the terrace and being exposed by natural erosion on the slope. Phase III was recommended.

A total of 14 50-x-50-cm test squares were excavated across and between the two original find loci during the Phase III testing. Additional debris recovered at this time included unmodified lithic debitage and a single unnotched triangular projectile point of grey Permian chert. The projectile point would suggest a Middle to Late Ceramic period age for this component. The context of the material, particularly when combined with a general assessment of the appearance of the landform and the appearance of cores extracted with an Oakfield soil sampler, suggested that this

was not, after all, in-place material. Instead, it seems more likely that it represents debris moved downslope from an original position on top of the terrace. The original location is not identified and may be entirely eroded away. Sediment, some of it with artifacts, is accumulating at the bottom of the gully. This interpretation not only accounts for the observed circumstances, but is consistent with the late prehistoric projectile point—an artifact obviously not expected within, but certainly possible atop, an early- to mid-Holocene terrace.

Sites 14WB102, in its original position, may represent part of the east end of J.V. Brower's (1898:34) "Schmidt village site." A few other small sites have been reported nearby during previous compliance surveys and there are reports of collectors finding material in this general area. Whether the transformation from the single large continuous site shown by Brower to a series of small loci is a result of the way Brower chose to characterize the site as opposed to the way we characterize the locality now, or if erosion and plowing have obliterated portions of the site but not others, or if some combination of these best characterizes the situation, is unknown at the present time. In any event, available data, including the testimony of Brower's illustrations, suggests that much of the material along here is attributable to the Early to Middle Ceramic period.

The small collection currently is housed in Roper's laboratory in Manhattan. Plans are to transfer it to an institutional curation facility when arrangements can be made.

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