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Number 4, 2003

14SD351, A Possible Keith Variant Burial

Robert J. Hoard, Michael Finnegan, Timothy Weston, and Randall Thies

Introduction

In January 2003, a hunter found bone eroding from a cut bank of a wash leading directly to Museum Creek in Sheridan County. The property is a walk-in hunting area, open to the public. The hunter excavated the area until he encountered a human skull. He stopped excavation and contacted Sheridan County Sheriff James L. Johnson, who promptly contacted archeologist Don Rowlison of the Cottonwood Ranch state historic site. Rowlison and Sheriff Johnson visited the site with the hunter, collecting the bone the hunter had excavated, which later was turned over to the Kansas State Historical Society (KSHS). The sheriff determined the burial was not a crime scene, and requested that it be removed as soon as possible.

The burial was exposed in the north-facing scarp of a draw leading to Museum Creek, 1.2 meters below the surface. A stone slab was positioned directly over the burial. This information led to the conclusion that the burial was clearly under the jurisdiction of the Unmarked Burial Site Preservation Board (or UBS board, as established by the Kansas Unmarked Burial Sites Preservation Act, K.S.A. 75-2741 through 75-2754). Briefly, the UBS law states that any unmarked burial in Kansas that is not a result of criminal action and is not on federal or tribal land is protected and must not be disturbed unless a permit is issued by the UBS board. The UBS board convened at 1:00 PM, January 31, 2003, by conference call. The board discussed three options: preservation in place, excavation and reburial nearby, and excavation and removal to the custody of KSHS. The board voted unanimously for the latter in order to protect the burial from the immediate danger of collection by the public. The board also voted for KSHS staff to conduct the excavation under a UBS permit.

Excavation of the Burial

Hoard, Thies, Rowlison and Dan Kysar of Palco, Kansas carried out excavation on Saturday, February 1, 2003. Excavators cleared a stratigraphic face to bedrock on the exposed scarp about 30 cm east of the burial to establish stratigraphic control and document stratigraphy. They then cleared the scarp face over the burial, defined the pit outline, drew a profile, and took photographs. The soil profile agrees with the description of the Ulysses soil, as described by Angell et al. (1984:46-47).

Excavation of the overburden followed. The feature boundaries became apparent at about 50 cm below the ground surface. Scattered charcoal and occasional mussel shell fragments were present in the pit feature fill. Excavation continued to the stone slab overlying the burial. At the time of burial excavation, the stone slab was lying at a slight angle, probably due to settling. The depth of its upper surface ranged between 90 and 100 cm below the sloping soil surface. When no more bone could be exposed with the stone slab in place, the excavators drew and photographed the plan view. Removing the stone slab revealed it to be a grinding slab with a clear, deep basin. Figure 1 shows the burial before removal of the slab.

Excavation continued to expose the burial. During excavation we encountered a long, thin bone artifact, rounded on one end, lying over the left rib cage parallel to the axis of the spine. This artifact was collected separately. Another suspected bone artifact, much shorter but as wide as the larger piece, also was recovered near and at a ≈35 degree angle to the lower end of the long bone tool. A small, nearly complete mussel valve was recovered near the left innominate and collected separately. Charcoal radiocarbon samples were taken from the pit feature fill.

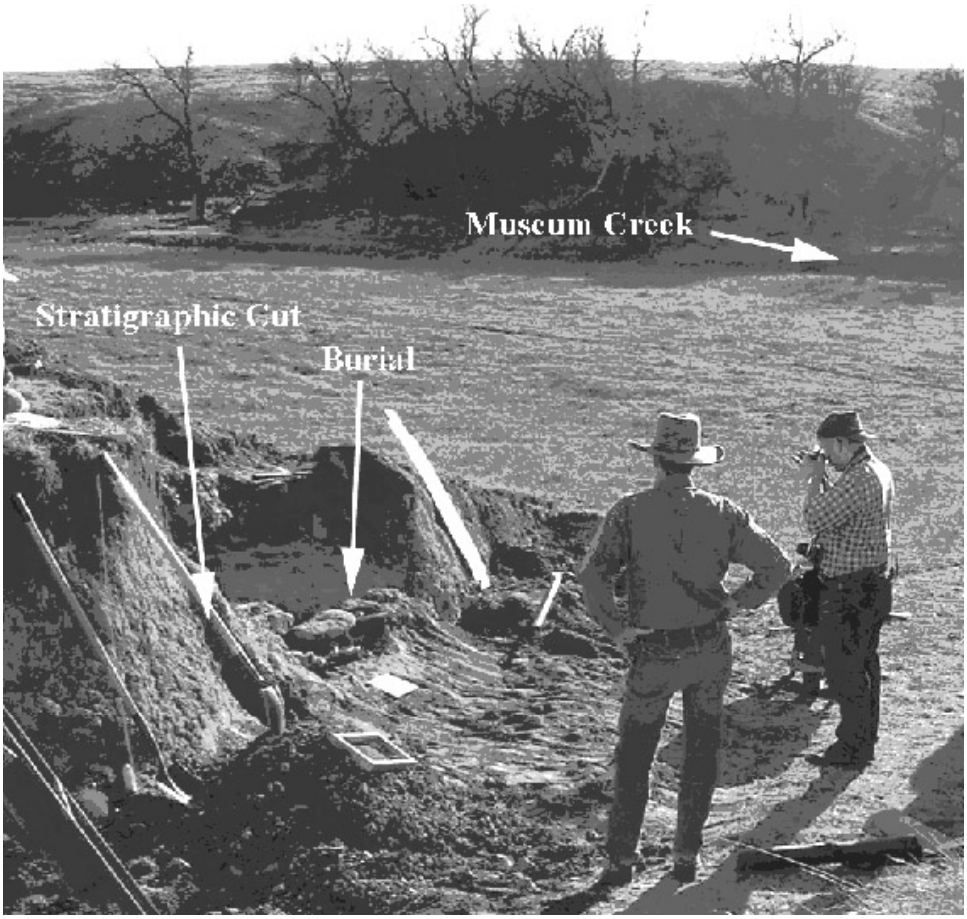

Figure 1. View of Museum Creek, the stratigraphic cut, and the partially excavated burial. Note the grinding slab over the burial.

Waning daylight and public knowledge of the burial led to the decision to fully remove the burial before nightfall. Individual elements were removed, identified, stabilized, and placed in labeled bags. Because the ribs and spinal column between the thoracic and lumbar vertebrae would have been time-consuming to excavate element by element, the excavators took this, the chest cavity, as a mass. The bottom of the pit revealed an approximately 3 cm thick band of gray, charcoal-flecked fill at the base of the burial pit feature. No evidence of in-situ burning, such as burned earth, was noted. The burial was transported to the KSHS archeology laboratory, where excavation was completed. One small flake of Smoky Hill Jasper was found in the fill from within and beneath the chest cavity.

Description of the Burial Pit Feature

This individual was buried in the flesh, flexed, on the right side, facing north, in a pit only slightly larger than the flexed dimensions of the skeleton. The uppermost evidence of feature fill was visible at 49 cm below the surface on the east edge of the feature and at 55 cm below the surface on the west edge. The bottom of the pit was between 110 and 130 centimeters below the sloping modern soil surface. The pit was 1 meter across at the bottom and 145 cm across at its highest visible limits below the sloping modern soil surface. The pit boundary was difficult to discern, but appeared to be straight up and down on the west side and sloping out on the east side. Burned material of unknown origin was placed in the pit before burial, scattered charcoal was present throughout the feature fill. The scattered charcoal was the most reliable indication of the boundaries of the feature.

Osteological Analysis

The remains, which include the major parts of the human skeleton, represent a 20 to 24 year-old male. The smaller, more cancellous bone is in poor to fair condition, the cortical bones are in fair to good condition. There is extensive post-mortem breakage. Age estimation is based on the pubic symphysis following Todd (1920) and supported by the level of dental attrition (Brothwell 1981, 1987) and suture closure (Olivier 1969). Sex determination is based on

pelvic morphology, supported by femur morphology (Stewart 1962) and cranial morphology (Keen 1950). Stature is estimated to have been 166.3±3.4 cm based on Genovés' (1967) formulations. The morphology of the cranium, femora, and teeth are within the range for a race determination of Mongoloid (Stewart 1962).

Significant anomalies include an unusually large nutrient foramen of the posterior body of the majority of the vertebrae and a sella turcica with both posterior clinoid processes also having an anterior process that fuses with the middle clinoid process on the right side and all but meets the middle clinoid process on the left side. A pathological screening showed these osseous remains to be unexceptional. However, the dental tissue shows a carious lesion on the occlusal surface of #15 (upper left second molar).

Radiocarbon Date and Cultural Affiliation

A sample of scattered charcoal in direct proximity to the burial was submitted to the Illinois State Geological Survey for a radiocarbon assay, which resulted in an age determination of 1370±70 BP (ISGS 5358) and a 13C ratio of –25.1 per mil. The calibrated radiocarbon date, using the program CALIB 4.1 (Stuiver and Reimer 1993) using the calibration dataset INTCAL98 (Stuiver et al. 1998), is cal AD 660, with a two sigma date range of cal AD 543 (660) 778. This date and the geographic location of the burial place it within the definition of the Keith variant (Adair 1996:115-116; Bozell and Winfrey 1994; Johnson and Johnson 1998:207-211; Kivett 1949; Wedel 1986:81).

The Keith Variant: A Brief Summary

The temporal range of the Keith variant begins somewhere between AD 1-500, depending on the source consulted, and ends around AD 800-900 (Adair 1996:103, table 24; 115; Bozell and Winfrey 1994:131; Brown 1987:18.4; Logan and Beck 1996:57). Keith variant sites range from southwest Nebraska through north-central and northwest Kansas and probably into eastern Colorado. It is the only taxonomic unit for this time period in Kansas west of the Flint Hills (Logan and Beck 1996:60). Site types include small hamlets with evidence of structures, camps, and burials.

Keith variant artifact assemblages primarily include pottery, chipped stone, and ground stone. Ceramic vessels typically are tempered with calcite and are cord-marked; projectile points are large, corner-notched, expanding stem types early in the variant, with small Scallorn type arrow points appearing later. A variety of bone and shell artifacts have been recovered. While no floral remains have yet been recovered from Keith variant sites, probably because of recovery techniques, grinding stones are very common (Adair and Estep 1991).

Keith variant burial practices have been defined as taking three forms: under house floors, in ossuaries, and in earthen mounds (Brown 1987:XVIII.5). In reality, the situation is somewhat more complex. The Woodruff Ossuary (14PH4) is probably the best-known Keith variant burial site. Located in Phillips County, about 70 miles northeast of 14SD351, the Woodruff Ossuary consisted of a large communal grave pit containing the remains some 60 individuals placed there as secondary burials, many of them in small pits contained within the larger grave pit. One primary burial also was present, an adolescent covered with thousands of shell beads (Kivett 1953). A wood charcoal radiocarbon sample yielded a date of AD 607±240 (1343±240 RCYBP, C-928, Libby 1955:104).

Although it has been said that Keith variant people normally did not bury their dead in mounds (Bozell and Winfrey 1994:136), Kansas does have one burial mound that can be confidently attributed to that culture. The Koerner Mound (14NS1), located in Ness County about 80 miles southeast of 14SD351, is

a circular mound five to seven meters in diameter, constructed of limestone slabs on a high prominence overlooking the Pawnee River valley. The mound was partially excavated by a KSHS archeological crew in 1967. The remains of at least seven individuals were discovered in that investigation, along with two marine shell beads, a shell pendant, a bone awl, 19 projectile points, and a few other chipped stone tools. The projectile points, some of them made of Alibates, are relatively small, quite thin, and very finely made, with corner notches denoting a Woodland cultural affiliation. Although no pottery has been documented from the mound, a Keith focus [or Keith variant] cultural affiliation has been inferred on the basis of the physical characteristics of the mound, its geographic location, and the presence of corner-notched projectile points (Thies 1993:16).

The Pfaff site (14NS319), located only a few miles from the Koerner Mound, is another well-known Keith variant burial site. The site was originally regarded as being a manmade earthen mound (Craine 1956), but the site was heavily damaged by bulldozing before being discovered, and this undoubtedly led to incorrect interpretations as to its origin. The site is located on an alluvial terrace within the Pawnee River valley. Craine described the mound as being some 100-150 ft long and 100 ft wide, and its size alone—along with its geomorphic setting—strongly suggests that it was a natural mound, probably a broad knoll or ridge. Unlike the situation at the Koerner Mound or the Woodruff Ossuary, the burials at the Pfaff site were primary burials, with the bodies apparently being interred as individual burials rather than as part of a communal grave pit—in other words, as part of a cemetery rather than an ossuary. Numerous pottery sherds (including one complete vessel) were found at the site, firmly indicating a Keith variant cultural affiliation. Other artifacts include over 600 bone beads along with 23 corner-notched projectile points. As was the case at the Koerner Mound, the projectile points are small, thin, and finely made, including some that are made of Alibates.

Artifacts Associated with the Burial at 14SD351

As noted earlier, a single unutilized flake of Smoky Hill jasper was found with the burial. Also, while mussel shell was noted in the feature fill it was not present in the surrounding matrix or on the soil surface, indicating it was intentionally added to the feature fill. Besides these items, two formed artifacts—a grinding stone and a bone implement—were associated with the burial.

Grinding stone. A large grinding stone lay upside-down on top of the burial. It is made of limestone; its shape is irregular but generally ovoid. Some of the edges look to have been shaped by pecking. Its longest dimensions are 45 cm long, 33 cm wide, and 9 cm thick. The deep, rounded grinding basin has a maximum depth of 6 cm. It weighs 13.33 kg.

Bone implement. As discussed above, a long thin bone implement was encountered with the burial during excavation, lying over the left rib cage parallel to the spine. A second, shorter implement was located nearby.

Both artifacts have clearly been ground and shaped, and are quite delicate in appearance (Figure 2). The longer implement is gently curved, with a total length of 32.6 cm, and a length along the chord of 30.6 cm. One end has been formed into a blunt tip. The maximum width near the tip is 8.4 mm, while the maximum thickness in the same area is 5.8 mm. The artifact tapers and thins toward the other end, which has been broken. The maximum width in this area is 7.3 mm, while the maximum thickness is 2.5 mm. The shorter bone artifact has been broken in two places but when re-assembled, exhibits a very gentle curve. Its maximum length is 82.9 mm, while its maximum width and thickness are 8.0 mm and 3.7 mm, respectively.

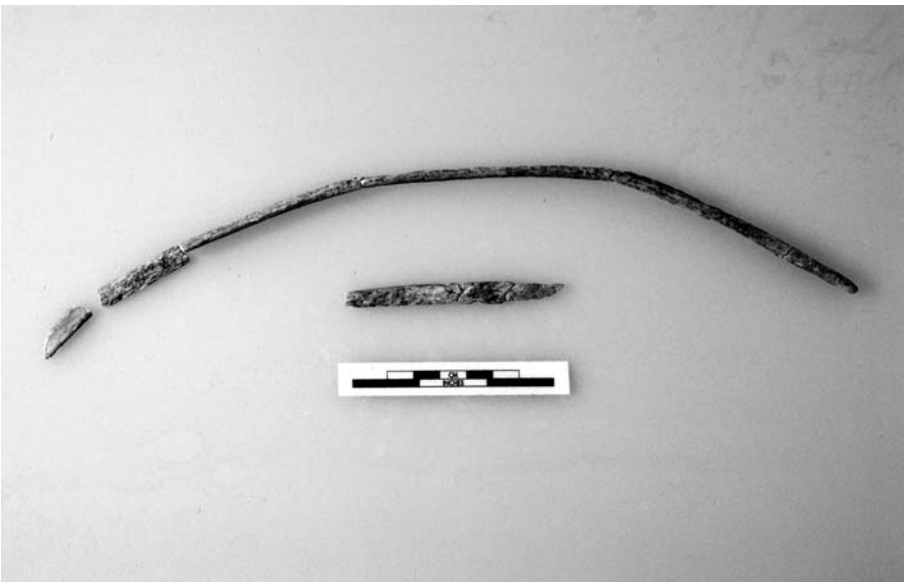

Figure 2. Bone tools recovered in association with the burial at 14SD351

The longer implement has been well shaped and ground, but cancellous tissue is clearly visible on the artifact's outer (convex) side. Its inner (concave) side is somewhat rounded and may contain some of the original bone's outer surface. Its tip has been purposefully shaped, and exhibits faint transverse grooves across its margins, likely left during the manufacturing process. It also exhibits smoothing consistent with usage (Figure 3). The lack of breaks or deep gouges suggests the working of some sort of soft material, but the precise nature of such activities cannot be discerned with any confidence. The shorter bone artifact is very similar to the thinner end of the longer one. Though the pieces do not fit together, it gives every appearance of being part of the larger artifact. This would suggest that a single artifact was broken into at least two pieces (one long and one short) prior to placement in the grave.

The long implement's gentle curve and apparent original bone exterior on its inner (concave) surface gives a clear indication of the bone from which the artifact was made. A bison rib closely matches the artifact's curvature and is the most likely raw material element (Figure 4). Despite the fact that the bison rib's dimensions dictated the overall curvature, a significant amount of labor was certainly necessary in order to work the implement into its final shape.

Bone artifacts are found in abundance in archeological sites throughout the Plains, and are especially plentiful in Plains Village contexts. Even a cursory review of summary literature reveals a wide variety of common tools such as bison scapula hoes,

Figure 3. Enlarged view of the longer tool's tip, showing faint diagonal scratches possibly resulting from manufacture and smoothing likely related to use

fleshing tools, awls, fish hooks, ornaments, etc. (Lehmer 1971; Wedel 1959, 1986; Wood 2001; Bell and Brooks 2001). Most bone tool studies are undertaken in conjunction with excavation reporting and tend to focus on description of tool form and discussion of presumed function

(garden cultivation, hide piercing, etc.). Other recent studies though, have examined bone tools from the perspectives of function, replacement, and acculturation (Moore 1985; Weston 1993; Sundstrom 2002).

Figure 4. Bone tools from 14SD351 in relation to a modern bison rib

Despite the well-established record of bone tool analysis on the Plains, long, thin bone artifacts similar to those described here are unusual. They are commonly described as belonging to groupings of ornaments, or antler/bone strips (Wood 2001:191). Most exhibit gentle curvature, but some are so small and tightly curved as to be classified as bracelets (Smith 1977:Plate 18). An artifact that closely resembles the bone artifact recovered with the burial at 14SD351 was found at the Great Bend Aspect Tobias site in Rice County (Wedel 1959:248, Plate 34). The tool was recovered in a cache pit, and had been broken into five pieces. It is smaller than the one described here, has a distinct notch at one end and has been perforated at the other. Wedel (1959:248) believed that it was made from antler since it showed evidence of cancellous bone on its concave surface and closely matched the curvature of unworked antler tines recovered at the site. Otherwise though, it is quite similar to the tool described here. Little speculation regarding function can be made, though the perforation on the artifact from Tobias suggested the possibility of suspension from a string (Wedel 1959:249).

A specific functional assessment of the tool interred with the 14SD351 burial cannot be made. What is known though, is that a delicate, carefully made bone artifact was placed with the burial. It might have been an implement used by the individual in life, or possibly an item of importance in the community.

Conclusions

Site 14SD351 is a possible Keith variant burial based primarily on its radiocarbon date and geographic location. The presence of charcoal and mussel shell in the burial fill and the associated grinding slab also are consistent with the Keith variant. However, in the absence of the cord-marked, calcite-tempered pottery characteristic of the Keith variant, it is difficult to assign the burial to this classification with certainty.

In his analysis of the coeval Woodruff ossuary, Kivett (1953:138) used measurements of five male and five female femora to estimate the average adult male height as 165.5 cm (range 162.7-169.9) and the average for adult females as 157.7 cm (range 155.4-161.2 cm) for the population represented at that site. The individual from 14SD351 fits comfortably into the male range. Further comparison of the osteological evidence from 14SD351 with other contemporaneous sites is necessary.

The function of the bone implement is enigmatic. However, given its fragile nature and its careful placement with a burial, it may be an artifact that does not have a utilitarian function, but rather may be associated with the sociological or ideological system of the buried individual.

In sum, the burial at site 14SD351 gives us one more glimpse into a time period in the High Plains that we would like to know better.

Acknowledgements

The authors acknowledge and appreciate the assistance of Sheridan County Sheriff James L. Johnson, Don Rowlison of the Cottonwood Ranch and Daniel Kysar of Palco, Kansas for their assistance in the location and excavation of these remains. The Kansas State Historical Society provided support for the excavation and analysis of the burial. The Unmarked Burial Sites Preservation Board convened on very short notice and was decisive in determining the actions to be taken to best care for the exposed burial. Special thanks go to Mr. Roger Milton who discovered the burial and complied with Kansas law by contacting Sheriff Johnson.

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Testing at the Vincent-Donovan Site, 2003

Shannon R. Ryan, Kale M. Bruner, and Jack L. Hofman, University of Kansas

The Vincent-Donovan Site (14BA308) is located in the Red Hills of South-Central Kansas in Barber County (Figure 1). The site consists of three localities. Locality A represents the first documented Folsom assemblage in Kansas. At Locality B and Locality C, respectively, a pair of articulated bison mandibles and a *Proboscidean* rib fragment were recovered *in situ*. Preliminary analysis of chipped stone artifacts from Locality A found most of the lithic material was local quartzite, however, non-local materials including Edwards chert from central Texas and Alibates from the Texas panhandle are also documented.

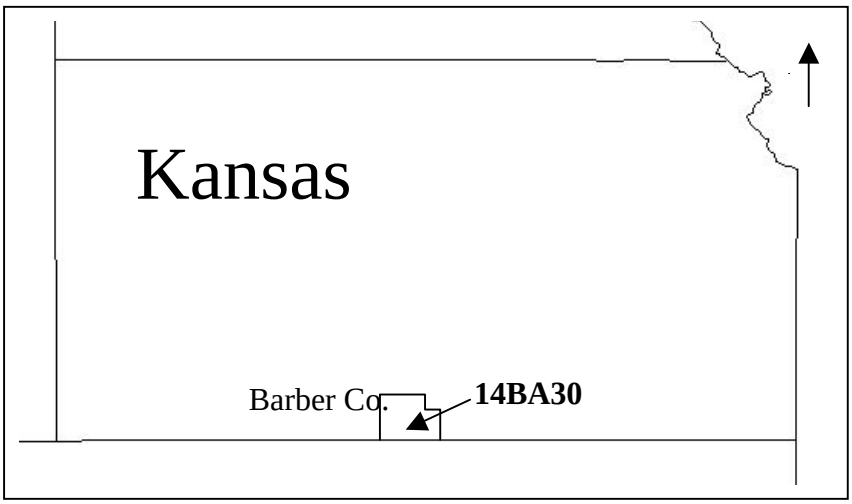

Figure 1. 14BA308, the Vincent-Donovan site is located in the Red Hills of South-Central Kansas

Locality A is located on a remnant terrace that is subject to considerable wind and water erosion. The site has been known by local collectors for at least fifty years and in 2002 John Vincent contacted the Kansas State Historical Society after finding the base of a Folsom point on the surface of the eroded western slope of the terrace. Bob Hoard and Will Banks conducted initial investigation of the site in June of 2003 and collected several flakes and an endscraper from the slump surface at that time. Testing of the site was carried out in July 2003 by the Odyssey Archaeological Research team, directed by Rolfe Mandel. Knowledge of the site was enhanced by surface collection of more than 60 chipped stone artifacts, topographic mapping, soil cores, and excavation of five 1x1 meter test units. Two of these units produced a total of 9 chipped stone flakes, one of which is a probable midsection of a channel flake. These units and profiles on the eroded edge of the terrace indicate that the cultural component is located within the top 10 cm of the terrace, with most artifacts occurring in the uppermost 4 cm. Soil cores and test units show that a layer of concentrated gravel deposits covers the terrace approximately 10-15 cm below the surface and there is no evidence of soil development.

The lithic assemblage (N=74) from the Vincent-Donovan site includes tools and modified and unmodified flakes. Diagnostic Paleoindian artifacts consist of a Folsom point base (Figure 2), a thin endscraper, and the midsection of an probable channel flake all made of Edwards chert, as well as a spurred endscraper made of Dakota quartzite. Additional tools include a discoidal scraper, one chopper tool, a lateral unifacial knife, and three cores. The Folsom base shows oblique flaking and is basally ground; fluting is visible on both sides.

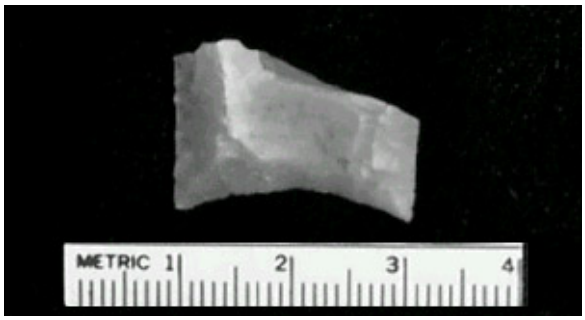

Figure 2. Edwards Chert Folsom Base, 14BA308

In addition to these tools, 57 unmodified flakes were collected. Local quartzites, including both Dakota (50.9%) and Ogallala (15.8%), make up 66.7% of the total unmodified flake assemblage. Non-local materials, including Alibates (1.8%) and Edwards chert (5.3%), account for just over 15% of the unmodified flake assemblage. These findings are in contrast to the proportions of lithic materials found among the modified flakes and tools (N=17). Although there is little change in percentage of local quartzite, there is a considerable increase in the percentage of non-local materials. Among the modified pieces, Alibates and Edward chert alone constitute 23.5% of the total.

Including the Folsom base from the Vincent-Donovan site, there are currently 66 documented Folsom points (and preforms) from Kansas. The probable channel flake from Vincent-Donovan is the second channel flake to be recorded in Kansas. Despite the documented presence of Folsom in Kansas, an assemblage such as Vincent-Donovan has not been recorded previously in the state. Of the 66 Folsom points found in Kansas only six of these (including the base from Vincent-Donovan) are made from Edwards chert. In addition to the Folsom base, 5 other pieces of Edwards chert from Vincent-Donovan were recovered (8.1% of the total assemblage).

Approximately half (46%) of the flakes from Vincent-Donovan have cortex. This may indicate the use of local quartzite cobbles as well as material from nearby quarries. There is a documented quartzite quarry in a nearby county (14CN418) and others are known from southwest Kansas (see Stein 1985). The use of quartzite by Folsom peoples has been documented at other Folsom sites, but is not common (for an exception see Stiger 2002). At Vincent-Donovan local Ogallala and Dakota quartzites combined make up 65% of the total assemblage. The use of local quartzites at Vincent-Donovan provides further evidence for diversity of lithic materials utilized by Folsom peoples.

In addition to the Folsom component, the Odyssey team investigated two other localities at 14BA308. As the site is situated within the heavily eroded Red Hills there are a number of remnant terraces nearby. Locality B is located approximately 500 meters to the southwest of the Folsom component in one of these remnants. It consists of an articulated pair of bison mandibles exposed on the east slope of a very small terrace remnant. Though this remnant has been significantly disturbed by the creation of a road the bison mandibles were found *in situ*. The size of the bones and wear on the teeth indicate the specimen to be a modern adult female bison. No cultural material was observed in association with the

bison bones and the mandibles were the only bones discovered at this locality.

Locality C, also in a terrace remnant, is situated between the Folsom component and Locality B. This area consists of a *Proboscidean* rib fragment exposed in the bottom of a gravel deposit approximately 70 cm below surface. Quartzite flakes were observed eroding out of the same remnant approximately 50 cm below surface, however, an association between cultural material and *Proboscidean* bone is not clear at this time.

Based on the find of a probable channel flake *in situ* on a terrace remnant and the presence of three diagnostic Paleoindian artifacts (a Folsom point base, a thin endscraper, and a spurred endscraper) on the eroded slope of the same terrace, the Vincent-Donovan site is the first Folsom assemblage to be documented in Kansas. Further excavations on this terrace will provide more information as to the nature of the site itself as well as contribute to the understanding of lithic material choices of Folsom peoples. In addition, investigation of the local geomorphology will enhance our understanding of the history of this area and of the archaeological materials found there.

Acknowledgments

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Kansas Archaeological Field School Investigations at the Warne and Johns Creek Sites, Lovewell Reservoir, Jewell County, Kansas

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The Kansas Archaeological Field School (KAFS), an educational and research program sponsored by Kansas State University, investigated two sites at Lovewell Reservoir, Jewell County, Kansas from July 28 through August 15, 2003. One of the sites (14JW8) is a portion of the Warne site, an extensive ridge top occupation of the White Rock phase, Oneota tradition. The other is the Johns Creek site (14JW34), a small lowland site of the

Central Plains tradition (CPt). Both sites had been recorded in 1991 during a reconnaissance survey of the reservoir for the Nebraska-Kansas Area Office of the Bureau of Reclamation and both were then recommended for National Register of Historic Places (NRHP) evaluation (Logan and Hedden 1992). Limited surface surveys and collections were done at both sites in 1992 (Logan and Estep 1993). Intensive survey, surface artifact piece-plotting, and topographic mapping of 14JW8 was done in 1993, at which time only a single test unit was excavated (Logan and Banks 1994). Cataloging, laboratory analyses, and curation are in progress at this writing. The following is a preliminary report of the project.

The Johns Creek Site (14JW34): This small site of Central Plains tradition affiliation was discovered during survey in 1991 and revisited during the survey project the following year (Logan and Hedden 1992:55; Logan and Estep 1993:68). At both times it appeared as a moderate density scatter of lithics and ceramics in a wild game food plot (milo) on a terrace along Johns Creek, a south-bank tributary of White Rock Creek. As a result of those investigations, 64 body sherds, one thickened rim sherd, a biface fragment, an end scraper, four modified flakes, 14 flakes and a core were recovered. In 1992, it was the only known CPt habitation in the Lovewell project area and, as such, promised to provide significant information about the Central Plains tradition in north-central Kansas. For that reason, it was recommended for NRHP evaluation (Logan and Hedden 1992:65-66; cf. Logan 1993:73). Subsequent insight that the White Rock phase in the same area was the manifestation of a Late Prehistoric Oneota migration and therefore contemporaneous with the CPt made such evaluation pertinent for that reason as well (Logan 1995, 1998a; Ritterbush and Logan 2000).

The KAFS investigation entailed intensive surface collection, piece plotting of selected artifacts (ceramics and chipped stone tools), topographic mapping, and excavation of six 1x1m units. Two of the latter were contiguous units. Eleven surface artifacts, including six body sherds, two rim sherds, one scraper fragment, and two pieces of burned stone, were mapped. An equal number of artifacts was piece-plotted within three of the test units: seven body sherds, one rim sherd, two flakes, and a mussel shell. The last item may be non-cultural. It was found within dense limestone gravels that occurred throughout several of the test units and probably indicates the soil containing the cultural horizon formed within an old stream channel.

The rim sherd from a depth of 18 cm in Excavation Unit (XU) 2 is the best diagnostic artifact recovered from the site thus far. The fact that it is one of only eight rim sherds recovered from the site thus far is indicative of the relatively sparse amount of cultural debris at the Johns Creek site. The rim is high (2.9 cm), everted, and decorated with a trailed, horizontal line just below the lip. Below the latter is a series of oblique tool impressions. It exhibits cordmarking below the decorative elements and above a sharply flaring shoulder, only a small portion of which remains. The vessel from which it came had a mouth diameter of about 17 cm.

Cultural material found in the test units includes one arrow point tip, two endscrapers, debitage, daub, ceramics, burned limestone, and a small amount of charcoal. The fact that very few artifacts were found below a depth of 20 cm in any test unit suggests plowing has disturbed the cultural horizon. No evidence of a house, beyond a small amount of daub, was found and no features were encountered. As the cultural horizon at the Johns Creek site is not horizontally extensive and is shallow, disturbed by plowing, and evidently lacking in

structural remains or features, it is not recommended for NRHP nomination.

The Warne Site (14JW8): 14JW8 is one portion of the Warne site, which covers a series of upland ridges for a distance of 1.5 km along the north side of White Rock Creek valley. First recorded as a much smaller site (14JW2) during the first Smithsonian Institution River Basin Survey work at Lovewell (Fenenga and Cooper 1951), Warne was later recognized as more extensive. In 1956 Neuman (1963) directed excavations in the western half of the site in an area now on private land. The site area (14JW8) investigated during the present project covers about 7.2 ha on the easternmost of two lobes of a northwest-southeast oriented ridge in the eastern half of Warne. Cultural materials in this area were discovered during survey of a wild game food plot in October 1991 and resurveyed in 1992 (Logan and Hedden 1992:38; Logan and Estep 1993:65). The site was more intensively surveyed and mapped in 1993, at which time a single 1x1m test unit was started (Logan and Banks 1994:4-9). The latter project was done as NRHP evaluation of the site, but work was curtailed by discovery of disturbed pit features at the nearby White Rock site that required salvage excavation. In 1994, the KAFS briefly surveyed the site, but did no test excavations (Logan 1995). In 2000, the senior author walked the site in search of obsidian artifacts, recovering one flake at that time; three flakes of that material had been found during prior surveys (Logan 2000). The purpose of the KAFS-2003 investigation, then, was to complete NRHP evaluation after a hiatus of nearly ten years.

This past summer much of the site was in milo, though the field was slightly smaller than that surveyed in 1993 and 1994. Surface visibility was very good. Our fieldwork included intensive surface survey and grab sampling of artifacts, plotting of selected surface artifacts, topographic mapping (precision upgraded from the transit theodolite used in 1993 to the EDM employed by the KAFS), and excavation of 15 test units. We found a relatively high-density lithic and ceramic scatter throughout the milo field, which was slightly smaller than the food plot surveyed in 1993 and 1994. Forty-one surface artifacts were mapped. These include rim and trail-decorated body sherds of Walnut Decorated Lip, the diagnostic ware of the White Rock phase (Rusco 1960; Neuman 1963), broken scrapers, knife fragments, modified flakes, an abrader fragment, and burned bone and burned limestone.

Test units were arbitrarily excavated in areas across the cultivated field where surface artifacts were visible. All but one of these revealed deposits of debitage and small pieces of pottery confined to a shallow (12-16 cm) plowzone. The exception, Excavation Unit (XU) 8, was laid out in a small area of conspicuously tall milo and where a few pieces of burned limestone were visible on the surface. Excavation of XU8 yielded the greatest concentration of cultural material below the plowzone of any unit and at greater depth, a shallow postmold or rodent burrow (Feature 1) and a pit (Feature 2).

Feature 2 was almost entirely within XU 8, though it extended a few centimeters into one of five adjacent units: XU10 (east), XU11 (south), XU12 (southeast), XU13 (west), and XU15 (this last was 0.5x1 m in area; all others were 1x1m). Of these, only XU13 contained a small portion of the feature. The other units yielded a few plotted artifacts that may have been associated with a thin midden that accumulated above and around Feature 2: XU10- three artifacts, XU11- three artifacts, XU12- three artifacts, XU13- 10 artifacts, and XU15- two artifacts. Forty-six artifacts were plotted in XU8 that proved to be within a shallow basin that sloped toward the pit, which yielded 206 mapped artifacts.

At a depth of 15-17 cm in the southeastern quadrant of XU8, an area of rodent disturbance that was first thought to be a shallow postmold, was defined as Feature 1. About 25 cm to its north another feature thought to be a small pit was discerned and defined as Feature 2. Cross-sectioning of that feature revealed more plottable artifacts in the presumed sterile soil around the "pit". XU8 was then cross-sectioned along an east-west line ca. 40 cm north of the southern edge of the unit to more fully expose the feature. From 17 cm to 23 cm, the northern portion of the unit contained more plotted artifacts, including bison bone, lithic debris, ceramics, and at the lower depth a human cranial fragment.

The human bone was not actually within the feature, rather it was part of an accumulation of debris around the edge of the shallow basin above it. The bone was identified as a frontal fragment by Prof. Michael Finnegan, Kansas State University, who completed a report that was submitted, along with the fragment, to the Nebraska-Kansas Area Office, Bureau of Reclamation on August 23, 2003. A report describing the discovery and context of the fragment was submitted to the BOR by the senior author on August 26.

The pit was irregular in outline, almost rhomboidal in plan view. It probably had been dug to a generally cylindrical shape, ca. 50 cm in diameter and 68-71 cm deep, but after having been filled with trash it was disturbed by rodents, particularly on the western side. More cultural material was found within the pit (i.e. below 23 cm) than above it, suggesting the pit had been intentionally filled with debris and that trash dumping above and around it subsequently declined.

A concentration of burned and fire-cracked limestone was found in the pit at a depth of about 40 cm within a thick matrix of ash, which extended below the stones to 55-58 cm (Figure 1). A near sterile, dark grayish brown silt, increasingly mottled with lighter silty clay was below the ash. This lower 10 cm of pit fill contained only a cluster of six body sherds from a single vessel. The sherds are decorated with opposed, trailed lines indicative of Oneota ware. Figure 2 shows the feature in cross-section, the ash horizon and the slope of the shallow basin towards the pit.

Figure 1. Northern half of Feature 2 showing concentration of burned limestone above ash layer at 40cm below unit datum (upper rebar in photograph)

An abundance of charcoal chunks and flecks was found throughout the basin and pit feature that will make it possible to radiocarbon date the feature. Radiocarbon assays for the White Rock phase are now limited to one from a pit feature at 14JW24 and a pair from each of two pits at the White Rock site (Logan 1995). These are the basis for attributing the White Rock phase to an Oneota migration to the

Central Plains ca. AD 1300-1450 (Logan 1998a; Ritterbush and Logan 2000).

Analysis of the faunal remains from Feature 2 will likely reinforce interpretation of White Rock economy as focused on bison hunting (Logan 1998b). With the exception of the human cranial fragment and one possible bird element, all bone from the pit appears to be bison. These include cranial (mandibles), axial (scapulae), and both upper and lower appendicular (e.g., humerus, metapodials and podials) pieces. Nearly all of the bones are fragmented, suggesting marrow extraction and bone grease processing.

Figure 2. Cross section of Feature 2 at 14JW8, northern half at 59cm below the southwestern corner of XU8. Note how the excavated ground slopes toward the pit, forming a shallow basin

Despite the evident shallowness of the cultural horizon at 14JW8, it is likely that other pit features remain and may yield significant information about the White Rock phase. For that reason, it is recommended that it be included with a multiple property NRHP nomination for the Lovewell Reservoir area that includes other White Rock phase sites.

Acknowledgments

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Archeology of Site 14ML417: A Summary

Mark A. Latham

Site 14ML417 is situated on a terrace in a cultivated field overlooking Limestone Creek in Mitchell County, Kansas. It is at the eastern fringes of the Glen Elder locality of north central Kansas, which is defined as the sum of the tributary basins feeding Waconda Lake (Latham 1996:3). This unit of the landscape includes all of the landforms and resources available to the prehistoric inhabitants in this portion of the Solomon River valley, including the Limestone Creek drainage. In June 1980, a Phase IV archeological investigation or excavation of the Solomon River phase house site 14ML417 was undertaken by the Kansas State Historical Society (KSHS) and the Kansas Anthropological Association (KAA). To date this site has not been completely reported, but because of the extensive research I conducted in the locality, I volunteered to write the site report for 14ML417. During the initial work on this task I worked closely with the late John Reynolds (then State Archaeologist), who "made" me promise I would finish the report and publish it through the KSHS. To fulfill my promise, I have spent much of my personal time for the last several years analyzing the artifacts and preparing the draft report. This paper is a summary of what has been done thus far.

In early 1980, archaeologists from KSHS were in the process of selecting the next site for the annual KAA training dig. The site they selected was 14ML417. On May 8, 1980 John Reynolds, Bill Brogan, Bruce Jones, and Don Rowlison initiated a limited proton magnetometer test of site 14ML417. To systematically conduct the test, a 1-meter grid, 20 m by 20 m, was established along the eastern edge of the north-south county road where a surface scatter of artifacts was observed and labeled Area 801 (Rowlison 1980). The magnetometer tests indicated that there was a strong possibility of buried features (Reynolds 1996, personal communication). With these findings it was decided that the KAA excavation crew would begin work in Area 801. The grid for Area 801 was a 20m^2 block along the edge of the county road. In June 1980, a crew of KAA members and KSHS staff conducted twenty-two 2 x 2 meter and fourteen 1 x 2-meter test units in Area 801, excavating a total of 116 m^2 or 29% of Area 801. These tests units were generally excavated to a depth of 30 cm below the ground surface of the cultivated field. The only feature found was that of a water line trench that was constructed a few years prior to these investigations.

When Tom Witty visited the excavation of Area 801, he found that the crew was recovering few artifacts and no features or intact cultural deposits. After hearing the frustrations of the excavators, Witty went down the terrace slope to another artifact concentration and conducted some soil core tests, which indicated subsurface deposits. In fact, he pushed the Oakfield corer through a pit feature within what would prove to be a house floor. With this new insight on the composition of the site, the investigation of Area 801 was abandoned and attention turned to the area where Witty found the subsurface deposits. This new area was labeled Area 802 (John Reynolds 1996, personal communication).

As the crew shovel-skimmed Area 802, several features became apparent that indicated the floor of a house. To control the excavation a little better, the first irregular shaped area shovel skimmed was called Area 802. As the excavation of the house floor continued, a third area was added, it was labeled Area 803. Area 803 was immediately adjacent to Area 802 and included portions of the house and exploratory trenches, which were excavated in search of external features/deposits adjacent to the house.

The portion of the house exposed was limited to the walls and interior features. The extended entryway was not excavated. The house was adjacent to a wheat field where excavations could not be conducted. Therefore the entryway was never excavated (Rowlison 1980; John Reynolds 1996, personal communication). Four interior storage pits were identified, along with a central hearth and 15 central support posts. A total of 49 exterior wall posts were excavated that average 12 to 20 cm in diameter. The house at 14ML417 measures approximately 10 by 11 meters and varies in several characteristics from those identified around Waconda Lake, in that it is "less extreme in its architecture" than those at the Sumpter site (14OB27) just upstream from the lake (Blakeslee 1999:70). A single radiocarbon date was obtained from material recovered from the hearth. The C-14 age was 850$\pm$50 B.P. (Beta 3334), with a calibrated age of 1160-1260 B.P. (Blakeslee 1999:41).

Excavation procedures for Area 802 and Area 803 were more expedient and less controlled than those of Area 801. Instead of defined excavation units, the area of the identified subsurface deposits was excavated by shovel-skimming the plowzone away. This procedure allowed for a more rapid exposure of

the features; a critical decision as the allotted time for the investigation was rapidly coming to an end.

In his 1980 field notes, Rowlison described the plowzone as being from the surface to around 15 to 20 cm below the surface. Thus, the excavation levels of 0 to 15 and 15 to 30 generally divided the excavation into plowzone (0-15 cm) and sub-plowzone (15-30 cm). The size and condition of the artifacts in the 15-30 cm level is more appropriate for analysis of the ceramics, faunal, lithics, and for the identification of features. In all, the best-preserved artifacts were within the house, especially in the pit features.

Area 801 may be an activity area adjacent to a house site. Such areas are common for similar habitation sites in the Glen Elder locality (Blakeslee 1999; Krause 1969, 1970, 1982; Latham 1996; Lippincott 1976, 1978), as many of the Solomon River phase sites that have been excavated in the locality have activity areas associated with houses. The main difference between the areas of these other sites and the one in Area 801 of 14ML417 is that many of the other such areas have associated features. These features range from a combination of storage pits and post molds to a series of storage pits. The lack of features in the work area of 14ML417 clearly separates inter-site behaviors within the locality.

The likelihood that Area 801 was an activity area is in question, as with questions relating to the scattering of artifacts reflecting the entire story or function of the human occupation. With a county road essentially defining the west boundary of the area, it is possible that features and structural remains are under or west of the road. The construction of the ditches has also adversely impacted the area. No radiocarbon dates were obtained from Area 801 and ceramic analysis indicates the area may not be directly related to the occupation of Area 802.

The author has completed the analysis for the ceramics, lithics, bone tools, and faunal and floral materials recovered from the site. These data are being used to study several different aspects of the site. A total of 137 ceramic jars have been identified during this analysis by comparing rim morphology, temper, paste, etc. Forty-seven vessels were identified from the activity area (Area 801) and 90 are from the house area (Areas 802 and 803). Comparing the characteristics of the rims in Areas 801 and 802 show a lot of similarities, but also show significant differences in zone decoration (Table 1). In general, Solomon River phase and other Central Plains tradition or mosaic variants, ceramic decorations were limited to the rims.

In Upper Republican sites, the majority of vessel rims were collared with decorated faces, while Smoky Hill and Nebraska phase ceramics had predominately plain direct rims (Figure 1 and Blakeslee 1999). The majority of Solomon River phase ceramics were divided between plain direct and plain collared rims. About 80 % of the identified vessels at 14ML417 had direct rims, with nearly equal percentages represented in Areas 801 (83 %) and Area 802 (79%). The differences between Areas 801 and 802 ceramics are noted in decoration zones.

In Area 802, the percentage of direct rims with modified edges is substantially higher than in Area 801. All of the complete and partial vessels recovered from within the house (Area

Table 1. Percentage of Ceramic Rim Styles, Site 14ML417

	Area 801	Area 802	Area 803	**TOTAL**
% Direct Plain	42.6	34.1	40	37.2
% Direct Decorated Lip	4	3.6	0	3.6
% Direct Modified Edge	8.5	25.9	20	19.7
% Direct Decorated Face	27.7	15.3	20	19.7
% Collared Plain	10.6	8.2	20	9.5
% Collared Modified Rim Base	6.4	1.2	0	2.9
% Collared Decorated Face	0	11.8	0	7.3
No. of Jars in Sample	47	85	5	137

802) have modified direct rims. Examination of the rims at the site shows an interesting pattern of increasing use of the modified edge decoration. A pattern of rough, poorly designed rim modification can be observed in many of the small rim fragments, thought to be from earlier pottery batches. The manufacturing techniques appear to be refined through time, as they appeared increasingly more polished. The progression of refining the modified rim design appears to show the development of a single potter.

Lithic analysis has focused on raw material procurement, chipped stone tool production and maintenance debris, and informal and formal tool identification and function. A total of 2,273 lithic artifacts were collected during the excavation, which have been divided between chipped stone (n=2,250) and groundstone and other raw materials (n=23). Of the chipped stone artifacts, 2,022 or 90% have been attributed to the production and maintenance debris, essentially the flaking debris byproduct from manufacturing and maintaining chipped stone tools. Most of the debris was Smoky Hill jasper flakes (Figure 2) from late-stage biface production or maintenance, which is typical at other Solomon River phase sites in the locality (Blakeslee 1999).

A total of 228 chipped stone tools were recovered from the site with essentially six forms represented, including projectile points, beveled knives, end scrapers, gravers, large bifaces, and retouched flakes. Several biface fragments and uniface tools were found that were labeled unspecified because the form and function could not be ascertained. Over half (59 %) of the chipped stone tools recovered from the site were made from Smoky Hill jasper, a pattern consistent in both Areas 801 and 802.

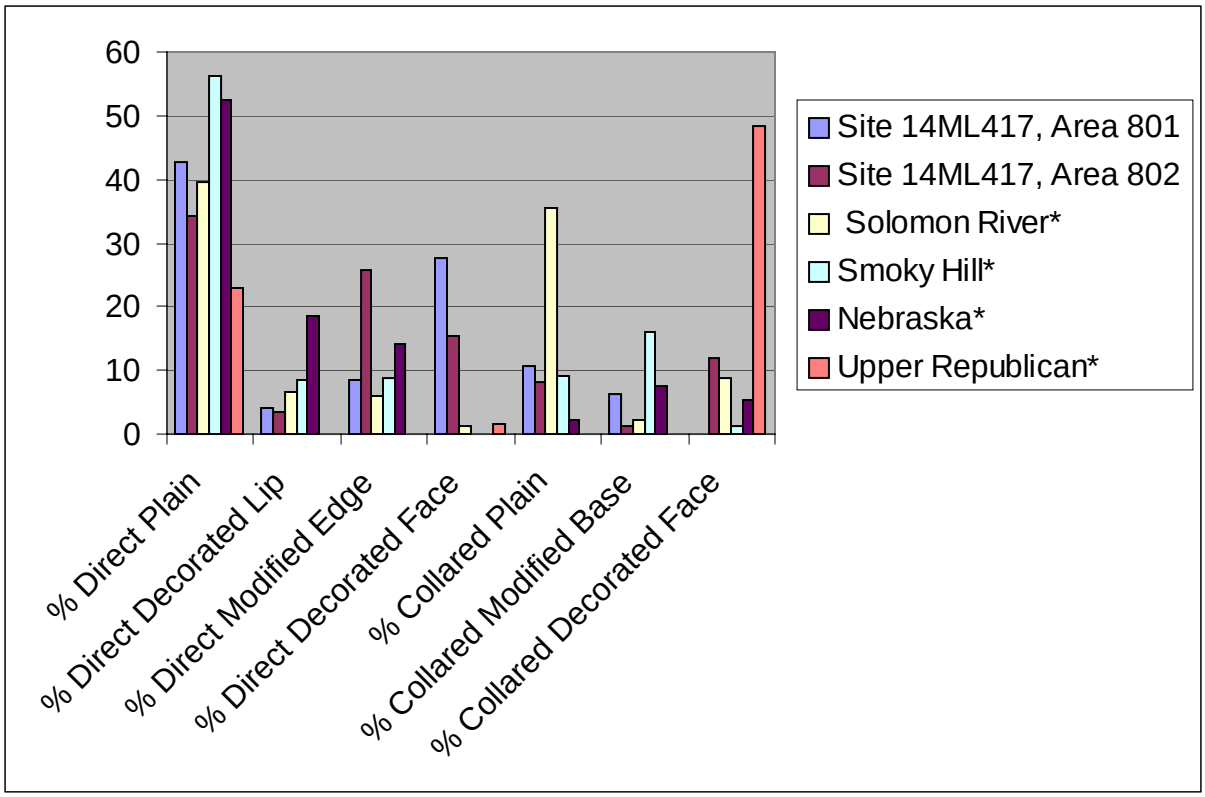

Figure 1. Comparison of Central Plains Rim Styles

Twenty projectile points made from five different materials were recovered from site 14ML417. Approximately a third (n=8) of these points were made from the locally available Smoky Hill jasper and seven from the Permian cherts found in the northern Flint Hills to the east of the site. Four of the points were made from raw material found in what is now the Texas Panhandle. The fifth material type is a brown agate, a material often observed in the stream cobbles of the region.

Groundstone tools recovered from the site were made from locally available sandstone and limestone, with some pumice. The most common groundstone tool was the grooved abrader. All eight abraders were made from locally available sandstone, the same material used in the tempering of several of the vessels identified. Other groundstone artifacts include a sandstone grinding slab and a limestone pipe.

Lithic procurement analysis indicates that no less than 15 different raw materials were used in the production of chipped stone tools. The ceramic and lithic data obtained is being compared to the results of Blakeslee's (1999) work on the Solomon River phase sites in the Waconda Lake project domain and other sites recorded in the Glen Elder locality (Latham 1996).

The most common bone tools recovered from the site were bison scapula hoes, of which many were fragmented. All six of the hoes were found within a pit feature of the house. Other bone tools and ornaments recovered included five awls, a squash knife, a worked ulna, six bone beads, three bone tubes, and several miscellaneous cut bone fragments.

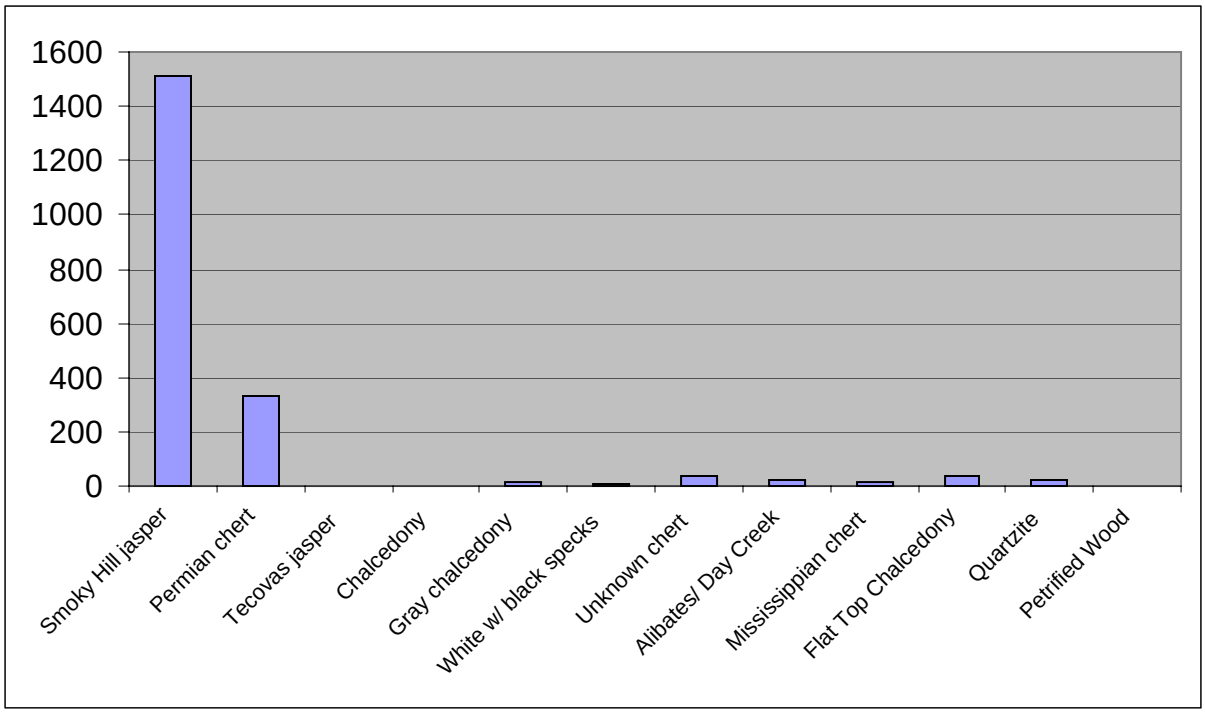

Figure 2. Site 14ML417 Lithic Debris by Raw Material

Faunal material at the site was very diverse, a factor common among such sites (Blakeslee 1999). The analysis and interpretation of these remains is based on a subsistence model for Upper Republican sites developed by Nepstad-Thornberry, et al. (2002). Faunal remains include five species of freshwater mussels and numerous mammals such as bison, white-tailed deer, rabbit, prairie dog, mice, gopher, mole, and dog. Birds, such as ducks, shore birds, perching birds, and upland game birds, were also identified in the faunal collection. Other elements included in the assemblage were from fish, reptiles, and amphibians. The floral materials were limited to corn kernels and cob fragments, walnut shells, Chenopodium seeds, and beans.

The results of these analyses are being drafted into report format. Other areas of the research focus on the architecture, spatial analysis of the site, and how the site compares with other similar sites in the locality. Any suggestions for this ongoing research will be considered and are appreciated.

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Great Bend Archaeobotanical Remains

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Analysis of archaeobotanical remains from eight Great Bend sites within the Arkansas City area was conducted with four primary objectives. First, these data will contribute to a general understanding of subsistence in the eastern part of the central/southern Plains in the 14th to 16th centuries. Second, the sites afforded an opportunity to observe the use of plants in different contexts and over a period of time. Third, there was a chance to look at inter-site variability by comparing samples from both similar and different features. Fourth, there was the hope of finding evidence linking plant use at these sites with one or more distant or related cultural complexes. This summary provides a very brief introduction of the on-going analysis.

Sites investigated included 14CO1, 14CO3, 14CO331, 14CO332, 14CO382, 14CO385, 14CO501, and 14CO1509. Samples were derived from both flotation and handpicking from areas of heavy charcoal deposits. Approximately 1500 flotation samples representing 15,000 – 18,000 liters of soil were analyzed from the 8 sites.

In an general sense, but based on somewhat limited data, the archaeobotanical assemblages from the 8 sites are typical of plant use on the eve of European contact across the eastern United States. Many populations throughout the Missouri and Mississippi River valleys were farmers focusing on a few crops, with maize clearly the dominant one. Squash, gourd, beans, and lesser amounts of sunflower, were

also planted and harvested. Collecting of wild resources, including nuts, fruits, and annual weedy seeds, was also a part of the subsistence practice. The most common identified archaeobotanical remains from the Great Bend sites include maize (*Zea mays*), beans (*Phaseolus vulgaris*), squash (*Cucurbita pepo*), sunflower (*Helianthis annuus*), marshelder (*Iva annua*), goosefoot (*Chenopodium* sp.), pigweed (*Amaranthus* sp.), several varieties of plum and cherry (*Prunus* spp.), grape (*Vitis* spp), little barley (*Hordeum pusillum*), spurge (*Euphorbia* sp), dropseed (*Sporobolus* sp.), black walnut (*Juglans nigra*) and tobacco (*Nicotiana* sp.). The quantities of the different taxa varied by site, but the overall diversity is quite low and fairly consistent between the sites.

Despite the somewhat uniform representation of plant remains, there is some interesting and unexpected information provided by the assemblages. Maize was recovered from almost every sample analyzed. Identified elements included kernels, kernel fragments, embryos that had popped out of the kernels, and cob fragments (cupules, cupule fragments, and glumes). A few complete or near complete cobs were also recovered. Morphological characteristics and discrete measurements can help describe the type of maize being grown, but may not be sufficient to determine the variety. For the Great Bend assemblages, five measurements could be easily taken on remains from almost every sample: cupule width, cupule length, kernel height, kernel width, and kernel thickness. When cobs or large cob fragments were recovered, cob dimensions, including overall size and shape, diameter, pith diameter, and row number were also calculated. Although the analysis is ongoing, the maize assemblage can be described as representing 8, 10, and 12-rowed cobs that varied from short cigar-shaped to long, slender and tapered cobs.

There are several varieties of plum and cherry represented in the assemblages, including wild plum (*Prunus americana*), black cherry (*P. serotina*), and choke cherry (*P. virginiana*). Although several of these species are also identified from earlier Woodland and Village period assemblages, the quantity is usually relatively low. At site 14CO385, the abundance of plum and grape pits in several features indicates a much higher utilization of this wild resource. The availability of these fruits may have increased as the amount of floodplain and terrace fields were tilled for crops. Perimeters of the crop fields would have provided ideal edge environments for fruits such as these to flourish.

Flotation samples from five of the sites (14CO331, 14CO332, 14CO382. 14CO501, and 14CO1509) yielded complete and fragmented marshelder (*Iva annua*) seeds and achenes. First recognized as a cultigen in the Early Woodland period (ca. 500 B.C.), marshelder was a common crop in the central Plains and eastern Woodlands. However, the large achenes, which are indicative of a domestication status, seem to disappear towards the end of the Village period and the crop is not currently considered to be present in early historic period economies. With the recovery of large marshelder seeds (all greater than 4.0 mm in length) from the five Great Bend sites, this consideration needs to be changed, as this size clearly indicates that domestication of this native plant continued into the 14th to 15th centuries. Within the Arkansas River valley, domesticated marshelder has also been identified at the Kuykendall Brake site, a 14th-16th century Caddoan mortuary complex. Although the contexts for the occurrence of domesticated marshelder differ from those of the Great Bend sites, the mere presence of this cultigen at this time period suggests that the crop did not rapidly disappear from Midwestern economies as once believed.

Implications of The Ceramic Assemblage in the Whiteford Site (14SA1, the Indian Burial Pit)

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The Whiteford site (14SA1), or Indian Burial Pit (or Salina Burial Pit), is reasonably well-known to most archaeologists in Kansas and to many beyond Kansas, too. At least this is true on a general level—in actuality, the history and archaeology of this site turn out to be more complex than they are usually made out to be. The full story is taking several hundred pages to recount and must be saved for elsewhere (Roper 2003b). Aspects of the site, however, are amenable to brief treatment, and among these is the ceramic assemblage. The pottery has already been described twice. One of these is as very general statements, along with photographs, in booklets by the site's excavators (Whiteford 1937; a second edition in 1941 [Whiteford 1941] has much of the same text but more photographs). The other is a more technical, but still rather condensed, account by Waldo Wedel (1959:518–519). The present account thus will be the third publication of this material. In it, I present the ceramic assemblage more fully than did Wedel, but still with less detail than in the full report of the Whiteford site, now nearing completion (Roper 2003b:302–337). My larger goal here, though, is to consider some of the implications of this assemblage for central Kansas and Central Plains tradition prehistory.

The Whiteford Site Cemetery

The Indian Burial Pit is, of course, a cemetery used over a period of probably about a century to a century-and-a-half in the twelfth and thirteenth centuries. It is attributable to the Smoky Hill phase of the Central Plains tradition and was, in fact, one of the sites Wedel (1959:563)[1] used to define the Smoky Hill phase. Various estimates have been made of the number of individuals interred in the cemetery. My estimate is 151, 102 of which are primary flexed burials and 49 of which are secondary burials of crania only. Individuals of both sexes and all ages are represented (Finnegan 1990), indicating equal access for all to cemetery burial. Burials preferentially were oriented with the head to the south, but no differences in other aspects of burial treatment (side lying on, direction facing, arm position, leg position, interment as primary or secondary burial) by age or sex are noted (Roper 2003b:367–401).

Funerary objects are not particularly abundant, nor are they diverse. Pottery is the most common artifact class represented, and is followed by shell beads and pendants.[2] Chipped stone objects include bifacial knives, a few projectile points from general context, and a small quantity of debitage. Several bifacial knives are comparable to what James Brown (1996:472), writing of these objects at the Spiro site, called a "generalized type of sword-form bifaces." John Reynolds (1990) described the complete specimens from the Whiteford site; fragments from several other knives also were recovered. Other miscellaneous funerary objects include a metate, a groundstone celt, a sandstone column, an abrader fragment, a bone awl, some corn, and some unworked mussel shells. Associations of funerary objects with

[1] As near as I can tell, Wedel subsumed house sites surrounding the cemetery on the same property under the "Whiteford site" designation, but I am quite certain he had the cemetery as well as the houses in mind when he defined the Smoky Hill phase. The houses on this property are now designated the Kohr site (14SA414) (Roper 2001).

[2] Beads would be, by far, the most abundant object class if we counted each specimen individually, but many beads occur on what obviously are necklaces, so the number of occurrences of beads is considerably more limited.

individual burials are extremely difficult to evaluate. Assuming even that many objects were placed with individuals and not as more general offerings, there is no apparent preferential association of types of objects with individuals of particular age or sex.

Methods

The human remains and funerary objects in the Whiteford site were, of course, reburied in April 1990. Funerary objects that had been removed during the 53–year period during which the site was displayed, but that were still with the site (some objects were and are missing) were replaced in their original positions for reburial. Prior to the reburial, the funerary objects were recorded three times. The Whitefords, the site's excavators, prepared a catalog with short descriptions of each feature (skeleton, funerary object) in the cemetery and often placed an illustration with the funerary objects (this catalog now is in the collections at the Kansas State Historical Society, catalog no. 71.138.3403). Waldo Wedel visited the site in June 1940 and compiled a feature-by-feature and object-by-object inventory. His greatest interest was in the funerary objects, so his notes include descriptions, with measurements, of each object (untitled notebook, Box 110, Wedel Papers, National Anthropological Archives, Smithsonian Institution, Washington, D.C.). And, finally, the material was again described, this time in greater detail, in field notes made early in 1990 by archaeologists from the Kansas State Historical Society.

My account, both here and in the full report, was produced not by actually handling the material, since it is reburied, but rather by drawing on the records, occasionally supplementing recorded detail with details observed on one or more of the numerous available photographs. It should be noted that some discrepancies are apparent among the various sets of records that make it difficult to even count the number of ceramic vessels represented in the site (some were missing and some are in poor condition, so, for some curious reason, no set of observers noted every vessel or sherd and, of course, each skipped over different objects), and certainly to be sure of which vessel is which. The only way to resolve this was to treat the records from the various descriptive studies not only as archaeological records, but also as historic documents, requiring external critique (cf. Wood 1990) prior to acceptance of certain information they contain (most critically feature designation and the provenience and association information the designation implies). Photographs often helped with this. I believe, however, that I was able to satisfactorily resolve all these discrepancies and that the inventory and descriptions I compiled are the most comprehensive account to date and the most accurate statement possible.

The Pottery

The ceramic assemblage from the cemetery includes 16 vessels that are either complete or nearly enough complete as to suggest they were put in the ground whole; 6 more vessels represented by 7 rim sherds that are enough incomplete as to suggest that it was in fact a rim sherd and not a whole vessel that was interred; and 3 vessels represented by body sherds that are enough incomplete as to suggest that it was in fact a body sherd and not a whole vessel that was interred. Wedel (1959:519), based on information in his notes, also indicates that "50 or 60 miscellaneous sherds" were collected. We have no idea of the provenience of these sherds within the cemetery. I would conjecture that some may represent individual offerings, but that at least some are fragments of the vessels that broke in the ground between their interment and their disinterment in the 1930s.

With the exception of one partial vessel, the pottery is characteristic Riley Cord-roughened ware, the diagnostic ceramic of the Smoky Hill phase (Wedel 1959:183-184). The

exception is one of the vessels represented by a rim section, but it is a large section and it is identifiable. It is from a bowl identified as Crockett Curvilinear Incised. This type was defined by Newell and Krieger (1949:98) for remains from the George C. Davis site in east Texas and has since been identified in sites throughout the Caddoan Area of Texas, Oklahoma, Arkansas, and Louisiana. It is found at the Spiro site in eastern Oklahoma, where it appears in Spiro II period grave lots dated to cal A.D. 1100-1250 (Brown 1996:358-360). Obviously, the type definition followed by some years the recovery of this sherd at the Whiteford site. The sherd was found early in the excavation, however, and correspondence from late 1936 between Wedel and the Whitefords shows that Wedel was already seeking the opinion of Caddoan Area experts as to its affiliation. He was able to give it a type name by the time he published *Introduction to Kansas Archeology* and he illustrated the vessel section with both a drawing and a photograph (Wedel 1959:520 and Pl. 91c). The fine hard paste shows it is not a local copy and is indeed an imported sherd in the Whiteford site. Regretfully, we do not know its provenience within the cemetery, nor do we know its association.

Table 1 lists major attributes of the Riley Cord-roughened vessels in the cemetery. The feature number listed here usually is that assigned by the Whitefords when the site was excavated; in a few cases, however, it is a number the KSHS investigators assigned in 1990, and in a few other instances of vessels whose provenience was never recorded, no number was ever assigned. Further details of feature numbering need not detain us here. The dimensions listed in the table are, of course, drawn from the records. While minimal, these are the only dimensions available for all pots. The dimensions are given to the nearest 0.5 cm, in part because the records for some vessels list dimensions no more precisely than that, and in part because a few dimensions had to be converted from the dimensions the Whitefords listed. Those dimensions were given in inches, generally to the nearest half-inch. Type identifications are mine, made after examining the records and photographs. They largely follow Hedden's (1992, 1994) Riley Cord-roughened pottery typology. Hedden's typology, however, does not accommodate what are here called "coconut pots." These vessels are recognized throughout the Central Plains tradition. They are a globular jar form with a constricted orifice, but no rim rising above the constriction. They often are referred to as coconut pots in the literature on account of their resemblance to a coconut. This may not be a great name and the type certainly needs to be more formally defined and named, but meanwhile, the term coconut pot at least communicates and fits a tabular entry.

We have it from both Wedel and the KSHS archaeologists that the Whiteford site vessels are grit-tempered and generally cord-roughened. Vessel shapes show some variation. The standard vessel shape is the globular to slightly sub-globular jar with a constricted neck and direct flaring or collared rim—the vessels numbered 73 and 84 (Figure 1) are examples. Vessel 88, however, while it has an overall globular body, has a sharp shoulder that gives way to a ledge that parallels the lip and meets the rim at a right angle (Figure 2). The direct rim is nearly vertical and may even slightly inslope. Another vessel is best described as heart-shaped (Figure 3). The shoulder is not as sharp as on vessel 88, but it is subangular and converges to the neck at an angle that is quite acute relative to the plane of the lip. The rim is vertical and may have a thin collar.

A notable characteristic of the ceramic assemblage is the overall small size of the vessels. Wedel (1959:518) briefly pointed this

Table 1
Whiteford Site Pottery Summary

Feature Number	Height	Shoulder width	Rim height	Type	Part
6	15	17.5	3.5	Riley Flaring Plain	complete
17	15	16.5	--	--	complete
28	9.5	11	1	Riley Flaring Plain	complete
54	15	13	1.5	Riley Flaring Plain	complete
55	12	13	1.5	Riley Flaring Plain	complete
56	15	15	n/a	coconut pot	complete
58	13.5	11	n/a	coconut pot	complete
65				body sherd	
73	20	17	2	Riley Flaring Plain	complete
84	13.5	15.5	2	Riley Collared Plain	complete
88	11.5	13.5	2.5	?	complete
110	15	15	n/a	coconut pot	complete
128	15		1.5	Riley Flaring Plain	complete
unnumbered	12	14	2	Riley Flaring Plain	complete
140	--	--	--	Riley Flaring Pinched	rim sherd
145	13	14.5	1	Riley Flaring Plain	complete
148				body sherd	
175	--	--	2	Riley Flaring Plain	rim sherd
179	13.5	15	2	Riley Flaring Plain	rim sherd
195				body sherds	
199	12	16	?	Riley Collared Pinched	complete
unnumbered	--	--	1.5	Riley Flaring Plain	rim sherd
unnumbered	--	--	3	Riley Collared Pinched	rim sherd
unnumbered	--	--	--	?	complete
unnumbered	--	--	--	Crockett Curvilinear Incised	rim sherd

out in his text, but since his vessel illustrations lack a scale of any kind, it is not overly apparent. As the data in Table 1 reflect, however, vessel heights for 16 vessels range from 9.5 to 20 cm, with a median of 13.5 cm and only one vessel taller than 15 cm. We may compare this with the height of vessels from house sites. For this, I used height data for two vessels from Saline County house sites, one of them 14SA415 (Roper and Reed 2003), the other Kohr House 1 (14SA414),[1] and for twelve vessels from the Minneapolis site (14OT5). These latter include nine vessels from House 23, curated at the KSHS, and three vessels the Nebraska State Historical Society excavated in 1934, also now curated at the KSHS (at least one or two of these vessels are the pots illustrated in [Wedel 1934:224]). Heights of these 14 vessels from domestic context range from 12.5 to 31 cm, with a median of 23.75 cm. This range shows

[1] The complete vessel from Kohr House 1 is not described in the report of that excavation (Roper 2001) because the vessel is not in the Whiteford Collection at the KSHS. Its whereabouts became known only after that report was published. It is in private hands, but I was able to examine, describe, and photograph it in October 2002.

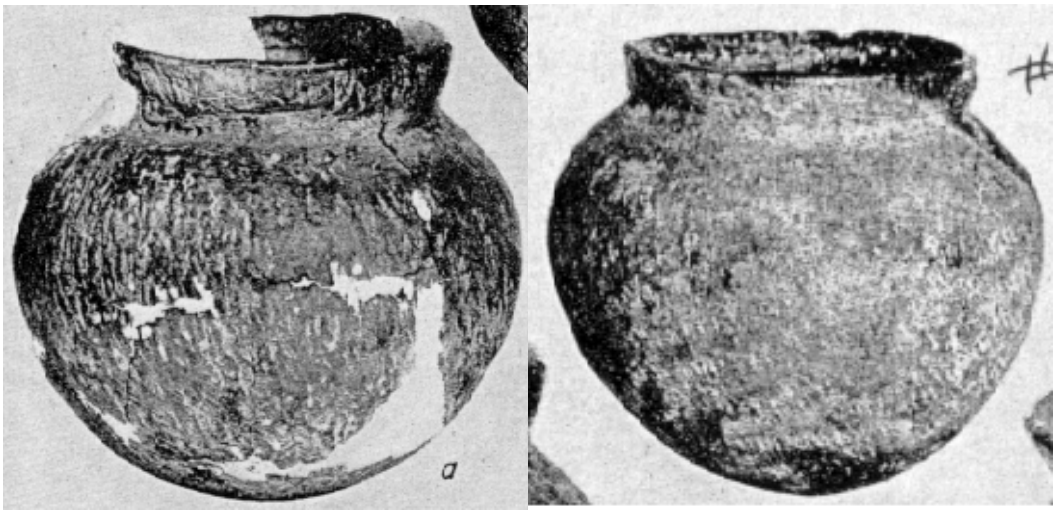


Figure 1. Vessels 73 and 84 (from Wedel 1959)

some, but overall little, overlap with the Whiteford site vessels (Figure 4). By way of further comparison, Feagins (n.d.) indicated that a single vessel in mortuary context from the Kingery site (14PH343) near Phillipsburg is 16.9 cm high, or just slightly larger than all but one Whiteford site vessel and smaller than most domestic context vessels, while Blakeslee (1999:103) indicated that complete or reconstructed vessels from domestic context at Waconda Lake areas sites range in height from 14 to 31 cm. The fact that the Kingery site and the Waconda Lake sites are called Upper Republican rather than Smoky Hill is irrelevant, for the distinction between Upper Republican and Smoky Hill is an arbitrary construction by archaeologists and not an identification of past social entities.

As the type name entries in Table 1 reflect, the Whiteford site pottery exhibits very little decoration. Three vessels—two of them represented by rim sherds only, the third one a complete, if damaged, vessel—show pinching on the rim or base of the collar. One "coconut pot" has several parallel incised lines encircling the uppermost part of the vessel, immediately below the lip. With one exception, this is the extent of decoration in this assemblage.

Figure 2. Vessel 88 (from Wedel 1959)

The exception is the heart-shaped, unnumbered vessel. This is a truly unique, almost bizarre, pot (Figure 3) that I have identified with a ? rather than a type name. The vertical rim with its faint collar is cord-roughened but undecorated. The body, however, from the shoulder nearly to the base, is decorated with a series of zig-zag, triangular, and spiral lines rather boldly incised over the cord-roughened surface. Although without precedent, this apparently is a

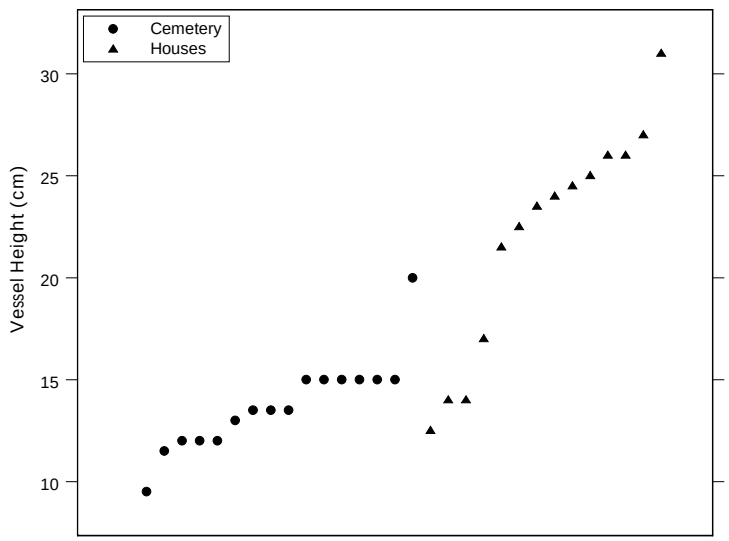
vessel of local manufacture. Wedel noted that except for the decoration, it otherwise does not differ from the other pottery in the cemetery. Similarly, Thies, describing it during the 1990 KSHS inventory, also found no reason to believe it is of other than local manufacture. One sherd in a small collection of unburied material from the site may be from this pot. The ceramic fabric is entirely consistent with the paste and temper characteristics of pots from nearby house sites. The vessel, of course, was reburied in 1990, but a cast remains in the KSHS collection.

Figure 3. Unnumbered pot, photo of cast at KSHS

Discussion

Other than the small size of the vessels, the most notable characteristic of the Whiteford site pottery is the low incidence of decoration. To understand this, we need only to look at the ceramics from the nearby excavated houses to discover that the incidence of decoration also is low in those assemblages. House 1 at 14SA414, with only 5 of 9 identifiable vessels being undecorated (Roper 2001:99-103) may not seem to support this statement, but 21 of 24 identifiable vessels in House 2 of this same site, 50 of 52 identifiable vessels from 14SA415, and 15 of 15 vessels from 14SA403, all sites within two miles of the Whiteford site cemetery, are undecorated. Smoky Hill phase pottery is known for the low incidence and simplicity of decoration, but the Salina-area/Whiteford site-area pottery shows an incidence of decoration unusually low even for Smoky Hill phase pottery, as I have more fully documented and discussed elsewhere (Roper and Reed 2003).

It is important for our studies of Central Plains tradition culture history and cultural dynamics that we recognize that this is <u>not</u> reflective of how Smoky Hill assemblages were composed at a particular point in time. That is to say, if we were to seriate ceramic assemblages from these and other sites in central Kansas, the assumption that we were placing these sites in relative temporal order would not be warranted. Certainly we could produce an ordering, but to assume that it is a temporal ordering requires that the criteria—pottery types in this case—be independently shown to be time markers. This has not been done and, I will suggest, cannot be done because, in fact, Riley Cord-roughened pottery types, like Central Plains tradition pottery types in general, as currently defined, are not time-sensitive. Again, this is more fully documented elsewhere, but accumulating radiocarbon evidence certainly does not support the interpretation of temporal change being the reason for variation among pottery assemblages.



heavily affected by this. In fact, when I took my first anthropological statistics class back in 1969, our textbook admonished us, in italics, to *never*—and that is the word it used—calculate a percent unless the number of cases is at least 50 or so (Blalock 1960:28). In the future, therefore, we will need to give more careful consideration to how we compare these small assemblages using any measurement that relies on proportions (cf. Drennan 1996 on these using proportions).

We may have other, methodological, reasons to also suspect the validity of many published seriations. In the first place, the number of ordering criteria often are low. The Smoky Hill phase pottery typology defines only six types. It is common that not all types are represented at all sites and that some of the types that are represented are represented by small numbers of vessels. In this case, the ordering is heavily influenced by perhaps no more than three or even two types. Unless assemblages contain identical numbers of vessels—and, while numbers may be similar they are rarely identical—the proportions of types will vary simply as a matter of arithmetic and rounding of numbers, and the small closed arrays will guarantee that a smooth ordering can be obtained along a single dimension. This problem will be exacerbated when the number of vessels is small. For the 9 vessels in Kohr House 1, each vessel represents 11.1% of the assemblage, while for the 52 vessels in the 14SA415 assemblage, each vessel represents 1.9% of the assemblage. Seriations represented as proportion diagrams or conducted using some coefficient such as the Brainerd-Robinson coefficient that ultimately rely on proportions or percentages, will be

I have yet one more reason to suspect the time-sensitivity of ceramic orderings—one that at this point is somewhat intuitive but I think a point to be considered. The Whiteford site cemetery did not accumulate rapidly and instead received the dead in the Smoky Hill–Saline rivers confluence area over a period that surely extended across a number of decades and probably even a century or more. Yet unless the ceramics were deposited during a very limited part of that interval, which I seriously doubt, they would show more variability if ceramic styles changed over time. In fact, radiocarbon age determinations for the nearby houses, for which ceramic assemblages match that of the cemetery, suggest a continuous presence in this area for well over a century, leading me to suggest this as an age and duration estimate for the cemetery itself (Roper 2003b:414-421).

Still, when Smoky Hill and western Central Plains tradition (Smoky Hill and Upper Republican and any taxon created to accommodate material at one time assigned to one of these) is viewed as a whole, ceramic variation is evident and this variation is not due to sampling error. At the broadest level, even the entirely arbitrary division of Smoky Hill and

Upper Republican is one manifestation of this. Although the variation is not in ceramics alone, ceramic variation is an important element in these phase distinctions. The ceramic typologies devised by Sigstad (1969) for the Upper Republican material in the Medicine Creek locality and by Hedden (1992, 1994) for the Smoky Hill material, are identical except that the Smoky Hill typology recognizes pinching as an attribute of the decoration dimension (plain or incised for Upper Republican, plain or incised/tool-decorated or pinched for Smoky Hill). All this really means is that pinching is spatially restricted. The simple incised (or tool-decorated) attribute of the decoration dimension is not sufficiently sensitive to show that certain incised motifs also are spatially restricted while others are widespread.

Within the domain of sites called Smoky Hill, examination of data for the ceramic assemblages from a number of houses spread over several counties (Beck 1998; Hedden 1992) also suggests a spatial ordering to the variation. Hedden's (1992:58) ordering of 10 assemblages from Ottawa, Clay, and Republic counties, for example, shows a strong spatial component. It should be remembered that Wedel originally used the Midwest Taxonomic Method and defined Smoky Hill as an aspect with two foci: the Manhattan focus and the Saline focus (1959:563). These two foci were spatially separate and probably, although this is not explicit, defined at least in part on the basis of ceramic variation. As one who would prefer less rather than more taxonomic pigeon-holing as a way of dealing with variation, I am hardly suggesting that we return to Wedel's original formulation. Rather, I am simply pointing out that spatial rather than temporal variability has long been recognized as the foundation of the western Central Plains tradition taxonomy.

Moving beyond taxonomy to the dynamics that I regard as the more interesting matter, the real question is what the spatial variation means or, more precisely for present purposes, what does the stylistic commonality in the Salina area sites signify? I will argue that it signifies a Middle Ceramic period multi-household community in the Smoky Hill-Saline rivers confluence area. The basic economic units of this community were the households that resided in lodges loosely dispersed along the low terrace edges adjacent to the meander belt of the main rivers. These households visibly reflect a reorganization of land use and resource use strategies as agriculture increased in importance to at least the point of a low-level food production economy (cf. Smith 2001). Investment in agricultural fields, housing, and perhaps other facilities in such instances encourages the development of a system of land tenure in which individual households lay claim to specific resource areas. The community, as a supra-household entity, will function to define access to those resources areas, negotiate disputes among community members who may lay claim to land and other resources, and exclude outsiders from using those resources (cf. Adler 2002). Goldstein (1980:8), extending the work of others before her, found that not only do groups that control access to resources maintain an well-demarcated area for disposal of the dead but, importantly for the archaeologist who is observing the material results and trying to infer the processes that generated them, the converse also is true and the existence of such an area is a good indication of the existence of such a group. In this case, then, the existence of the Whiteford site cemetery, particularly in concert with the ceramic style commonality expressed in the area surrounding it, seems a good indication of such a supra-household entity in this area at this time.

Whether this community has parallels elsewhere in the Central Plains tradition is a subject for continuing research. Although it is another subject, reworking our approach to

ceramic analysis not only will be helpful, but is a must. Only then will we be able to more closely examine the spatial (and temporal, as long as we also augment our chronological data base) distribution of ceramic styles and evaluate the results. I suspect, however, that we will find the upper Kansas River basin to be not so much a landscape filled with communities of dispersed agriculturalists as a landscape across which social and economic organization varied considerably. Elsewhere (Roper 2003a; also, but only briefly, 2002:193-194) I have presented a scenario for the western edge of the Central Plains tradition that suggests cyclical occupation and abandonment of even such favored areas as the Medicine Creek valley. These cycles likely were driven by resource instability, a problem not so evident in central Kansas. Ceramic heterogeneity and the strong symboling reflected in a high proportion of ceramic decoration, along with the apparent lack of community mortuary facilities of any note may be one reflection of this.

It is because the Whitefords excavated not only the Whiteford site cemetery but also some nearby houses, and because the Reeds have also been active in documenting Smoky Hill phase houses in the same area[1] that we have the data base to identify the twelfth-thirteenth century community in the Salina area. Further study of remains from this area will be essential to a better documentation of the social and economic organization in this locality. Equally critical, however, will be similarly-conceived studies of other localities to determine parameters of social organization over a wider area at this critical period. The results, I believe, have considerable implications for understanding cultural evolution on the Central Plains.

[1] The Reeds' ceramic collections from these sites are, with one exception (Roper and Reed 2003), not quantified, but I have done a preliminary examination of the material from many sites and enter these results into my argument.

Acknowledgements

My work on the history and archaeology of the Whiteford site is being conducted under contract with the Kansas State Historical Society. My thanks to everyone in that office for help of some kind during this study. My thanks also to the KSHS for separately funding a trip to Washington to retrieve Wedel's notes from the National Anthropological Archives. It may not be obvious here, but the full study will show how critical those notes were for accurately matching vessels to features. Harold and Margie Reed have also shown me many wonderful things in their collections and this has immensely increased my understanding of the situation in the Middle Ceramic period Smoky Hill-Saline rivers confluence area. Chris Garst facilitated my measurements of the Minneapolis site vessels that I used in the comparison in Figure 4. Finally, and importantly, my dog Bonnie, although demanding her exercise and food, is also amazingly tolerant of the amount of time I spend reading and writing about all this stuff.

Note: "Wedel's" photographs reproduced herein are actually photographs made and originally published by the Whitefords.

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Archaeological Investigations at the Evans Locality, Stranger Creek Valley, Northeastern Kansas-2003

Brad Logan, Kansas State University

Introduction

From May 19th through June 6th, 2003 eight students of the Kansas Archaeological Field School (KAFS), sponsored by the Division of Continuing Education, Kansas State University, investigated a series of sites at the Evans locality, a ca. 120-acre tract at the confluence of Stranger Creek and its tributary, Little Stranger Creek, in Leavenworth County, Kansas. The project continued from June 10th through June 13th with help from five members of the Kansas Anthropological Association. Previous surveys and excavations had documented several sites in the locality, three of which were targeted for more exploration: Paul (14LV1043), Evans (14LV1079), and Scott (14LV1082). The goal of the project is to determine the National Register of Historic Places (NRHP) eligibility of Evans and Scott and to conduct more extensive surveys at Paul and elsewhere in the locality. Follow-up analysis, report preparation, and completion of NRHP nomination forms is supported by a grant from the Historic Preservation Fund, National Park Service, awarded by the Kansas Historic Preservation Office, Kansas State Historical Society.

Evans Locality (Figure 1): I had surveyed the locality in 1979, 1981, and 1982. No sites were found during the first survey by a team of two persons in the portion that later proved to contain sites 14LV1043, 14LV1082 and 14LV1083 (Logan 1981). In 1981, intensive survey by a crew of 19 persons in other areas located three lithic scatters of unknown prehistoric affiliation (14LV1034, 14LV1036, and 14LV1037) and one historic site (14LV1035) (Logan 1983:77). Flooding in June 1982 exposed two other sites that were found by Jerry Paul, a local artifact collector. Later that summer, I reviewed his collection from the sites and, in his company, inspected them. One of the sites (14LV1044) is a rocksheter ca. 1m high, 1.75 m wide, and 2.5 m deep in the sandstone (Tonganoxie member) cliffs that are the western

bank of Stranger Creek a short distance downstream from its confluence with Little Stranger Creek. Over time, the shelter had filled with sediment. Paul removed this fill, recovering a small sample of debitage, one biface, and some charcoal associated with a "burned area" on the floor (Logan 1983:79-80, 144-145, 166). The second site (14LV1043) found by Paul was included in the KAFS investigations this past summer.

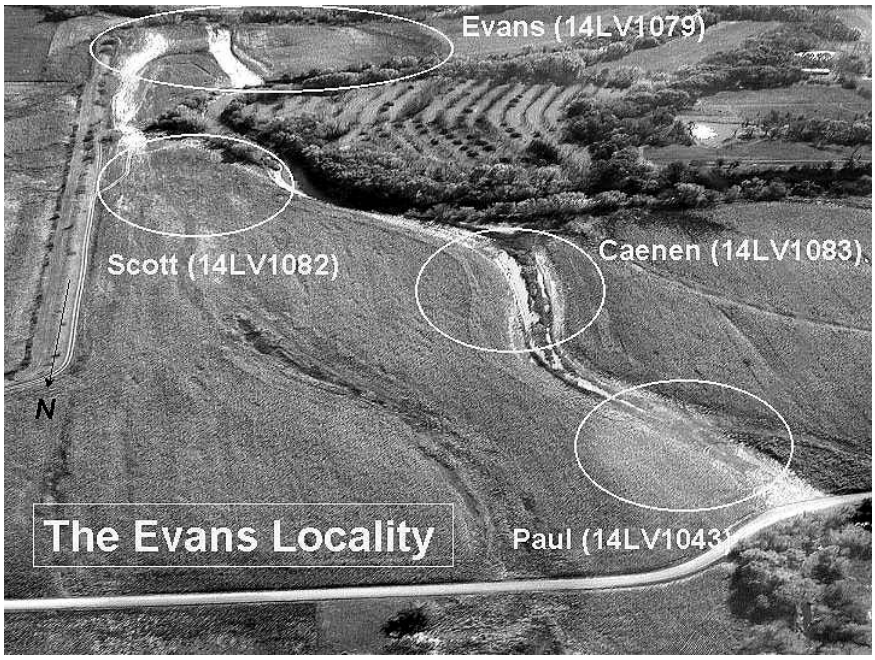


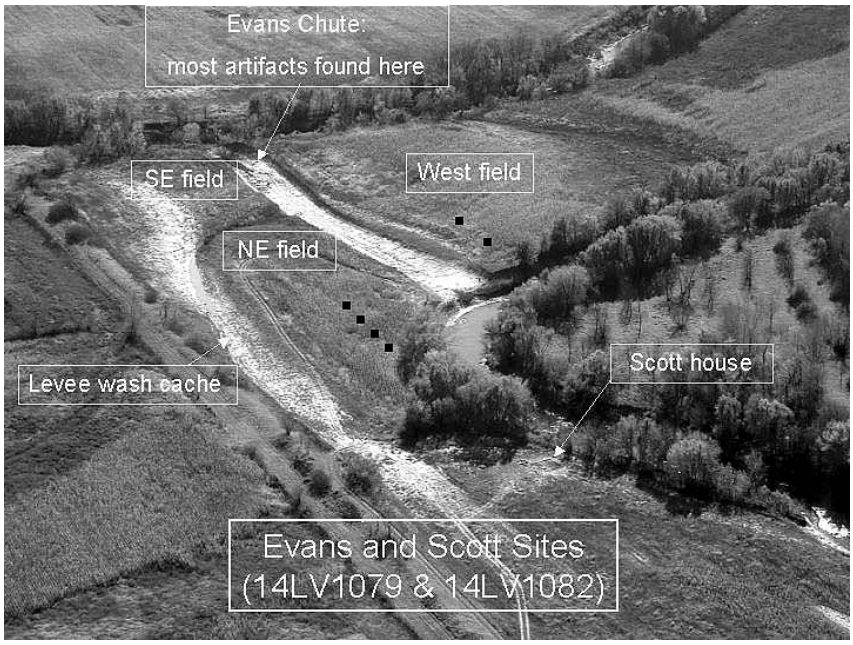
Figure 1. Aerial photograph taken October 2001 of the Evans locality showing locations of sites discussed

It is apparent that the Evans locality was favored for settlement over an extended period, but only within the past year has it become more clear that this span began at least as long ago as the late Middle Archaic, during the waning years of the Altithermal climatic episode. Perhaps during that post-Pleistocene time of maximum aridity much of Stranger Creek watershed dried up (cf. Grüger 1973:245 for the adjacent Delaware River drainage) and hunter-gatherers then focused resource procurement and settlement activities on the lower portion of the major valley. Yet, as the following site descriptions indicate, the locality continued to be occupied, at least intermittently, during the Late Archaic, Middle Woodland, and Late Prehistoric periods.

Evans Site (Figures 1-2): In July 1999 Scott DeMaranville informed me about this site, which I named for the brothers John and David Evans, owners of the locality. After I reviewed his collection, we visited those areas, scoured during times of flood, where Scott had collected many chipped stone tools. These include a wash that extends north to south across the entire locality from Little Stranger Creek to Stranger Creek. For much of that length it runs near the west side of an artificial levee that is the eastern boundary of the Evans site. This levee is indicative of the frequency of flooding in this part of the valley and the pooling of water (but for the dike) along its margins. Several years ago (the late 1990s) a "pothunter" excavated a pit in the base of this wash at the Evans site where scouring had apparently exposed a cache feature. While we do not know what artifacts were then removed, we are fortunate the vandal was not thorough in artifact recovery. In the backdirt from the pit, Scott found 39 bifaces, including 13 ovate and triangular performs of an exotic chert (Permian?), a complete corner notched dart point, and the base of a contracting stemmed point. He also recovered dozens of pieces of shattered debris, obviously fragmented during "excavation," and from these he mended a few of the bifaces.

Scott also collected chipped stone tools, including Woodland corner notched projectile point-knives (PPKs) and Late Prehistoric

Figure 2. the Evans site showing locations of areas and features investigated and the six test units dug in 2003



(notched and unnotched) arrow points from scoured portions of areas that I have defined as the West Field and Southeast Field. A chute (here dubbed the Evans Chute) that separates these fields has formed, according to Scott and the tenant farmer, within the past 15 years. It cuts across a tight meander of Stranger Creek, one that obviously cannot be negotiated during times of peak flow. Scott has collected several corner notched and contracting stemmed PPKs from the chute, primarily from a lag deposit at its downstream end. That many of these artifacts belong to a Middle Woodland component is suggested by the few sherds of plain surfaced, sand tempered ware found in the West Field at the margin of the chute. One of these exhibits rocker markings, an attribute of Kansas City Hopewell pottery (Wedel 1943; Shippee 1967). Forming the western boundary of the site is an older, inactive chute. A few artifacts have been found along its slopes, indicating erosion penetrated at least one buried component.

The KAFS at Evans included excavation of four 1x1m test units along a north-south line across the center of the Northeast Field. The pot-hunted cache feature described above was in the wash adjacent to this field on the east and pieces of fire-cracked quartzite were exposed in a buried soil on the eastern side of the Evans Chute at a depth of ca. 1.35 m, suggesting excavation of test units to that depth in the Northeast Field might reveal intact cultural deposits. However, excavation of three of the units to depths of 1.5-1.65 m did not encounter significant cultural deposits. Only one yielded artifacts, two moderately sized pieces of unmodified ferrous oxide that may have been manuports for pigment processing. One of these was found at 1.45 m and the other at 1.62 m.

Explorations in the West Field and Evans Chute were more productive (Figure 2) During survey of the recently disced West Field, we found a concentration of lithic and ceramic debris in its southern portion and another along the northwestern margin of the chute, beveled by the surge of floodwater from Stranger Creek in June 2001. Of the two test units dug on the higher ground beyond the beveled surface, one (TU5, Figure 3) yielded artifacts to a depth of 60 cm (excavation of TU6, which contained no artifacts, was stopped at 30 cm). Artifact frequency data from TU5 (Table 1) support the interpretation that the many artifacts on the beveled surface were a lag deposit from a component that extends below plowzone (i.e., below ca. 20 cm) in the area not affected by scouring. Most of the artifacts, all chipping debris, were found from ca. 25 to 45 cm. That the buried component is Middle Woodland is suggested by blocky and conical scrapers found

on the beveled ground a few meters from TU5 and by surface finds of Scallorn points and plain, sand tempered pottery in the southern West Field.

Table 1. Frequency of Artifacts in Test Unit 5 at the Evans Site

Level Number/Depth (cm)	Number of Flakes	Mass of Flakes (gms)
1/0-10	1	0.7
2/10-20	1	1.7
3/20-30	16	8.4
4/30-40	62	59.1
5/40-50	28	15.0
6/50-60	1	<0.0

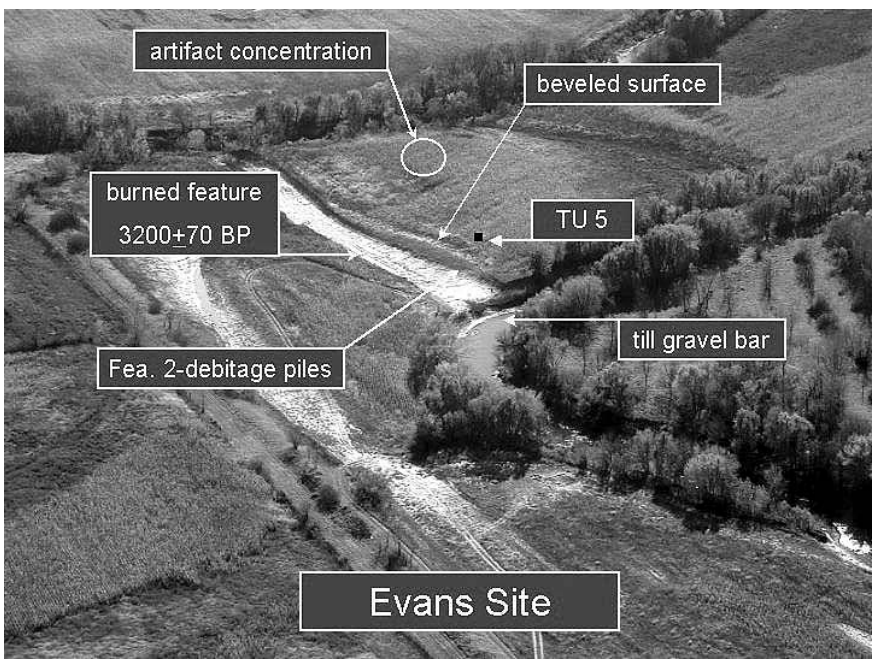


Figure 3. Aerial view of the Evans site showing the locations of the artifact concentration, Test Unit 5, and the beveled surface in the West Field, Feature 2 and the naturally burned and C14 dated feature in Evans Chute, and the gravel bar at the north end of the latter

One student noticed a cluster of flakes of Toronto chert in a rill on the western side of Evans Chute below the beveled surface. Initially attributed to redeposition from the latter, these proved upon excavation to be part of a concentration of debitage consisting of two piles surrounded by a lighter scatter of small and large flakes at a depth of ca. 1.88-2.0 m below the beveled edge of the chute (Figures 2-4). The elevation of the piles is 2.3m below the southwestern corner of TU5, indicating the depth at which their cultural horizon might be found if it extends to that area. Though no diagnostic artifacts were found with the feature, we can be reasonably certain from geoarchaeological data that this is evidence of Late Archaic flintknapping. During their inspection of the Evans locality this past summer, William Johnson (Department of Geography, University of Kansas) and his graduate assistant, Abby Varner, recovered charcoal from a naturally burned feature on the eastern side of Evans Chute about 30 m south of the debitage piles. A sample of charcoal from the feature, collected at a depth of 2.20 m, returned a date of 3210±70 BP (delta C13 value= -26.0) (ISGS-5374). Since that feature is in the same stratigraphic unit and at approximately the same depth as the debitage piles, it is reasonable to infer a comparable age for the latter.

Artifacts from earlier Archaic activity in the Evans locality were found on a gravel bar at the north end of the Evans Chute (Figures 3, 5). Interestingly, Scott had never seen the bar before, but drought conditions this summer lowered the stream sufficiently to expose it. It

resolved one problem- the source of fire-cracked pieces of quartzite seen *in situ* in the aforementioned paleosol at the northern end and on both sides of the chute at depths of ca. 1.35 m. These apparently belong to yet another component that is between the previously described Middle Woodland and Late Archaic components. Pieces of this material also occur in greater concentration, albeit *ex situ*, at the southern end of the chute. It is likely that the source of these hearthstones is either this bar or one like it in the channel of Stranger Creek. In addition to numerous quartzite cobbles, the students also found a few bifaces and biface fragments. One is a patinated, complete Scallorn arrow point, but most are older. These include a few side-notched points, indicative of Middle Archaic activity. Most of the artifacts are patinated from exposure to stream action. However, two have no patina and are in perfect condition, suggesting they eroded more recently from their primary context, perhaps not far from the bar. One is a Logan Creek projectile point the blade of which has a plano-convex cross-section, reflecting minimal retouch along the edges of one face. The other is a square-stemmed, concave-based PPK of Plattsmouth chert found on the bank about 30 cm above the bar. If the original depth of this artifact was near its place of discovery, it points to an Archaic horizon older than that of the debitage piles in Evans Chute.

Scott Site: Scott DeMaranville discovered this site after severe flooding in June 2001. Excavations in July and October of that year and May 2002 uncovered the most complete remains of a Steed-Kisker phase structure in Kansas, as well as a rich assemblage of pottery, chipped stone tools, groundstone tools, and burned plant remains that include several pieces of the supporting framework of the house (Logan 2001, 2002; Figure 6). A radiocarbon date of 630±70 BP (AD 1275-1428, calibrated two sigma range) was obtained on a sample from one of the burned beams. Other radiocarbon dates are pending.

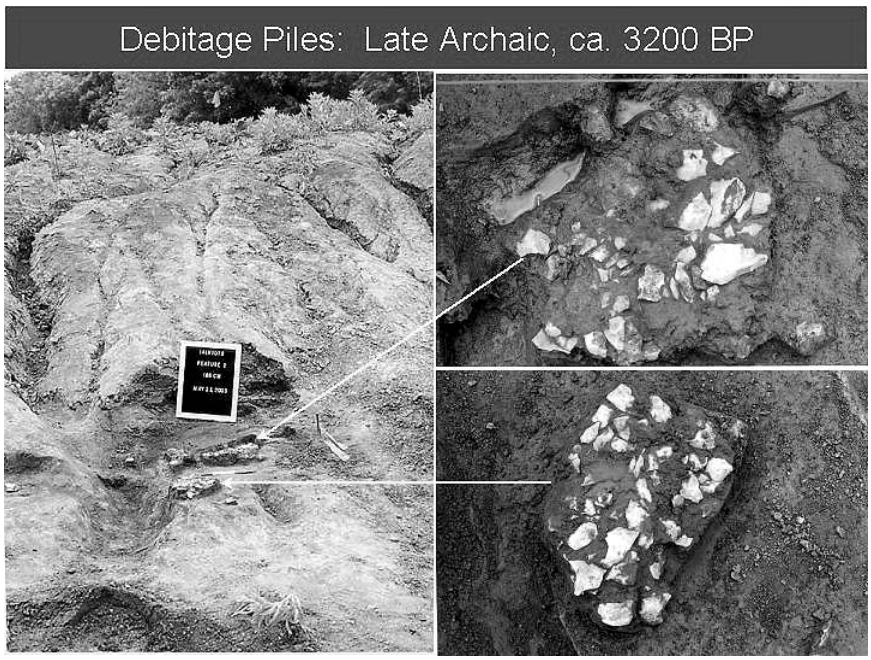


Figure 4. Feature 2 in Evans Chute with close views of the piles of Toronto chert debitage

The goal of the KAFS work at Scott was to better determine the horizontal extent of the site and to explore beyond the house for features and activity areas. While we could trace the limits of the site by the distribution of a light scatter of ceramic and lithic debris, we were disappointed in our search for features and activity loci. We dug 11 test units, including seven 1x1 m units and four others that exposed 2x1 m areas. In most of these we found shallow deposits (10-15 cm) in an equally thin plowzone. We excavated seven units east of the house in a light scatter of

lithic and ceramic debris and one to the north of the house where only a few items were seen on the surface. None yielded more than a dozen pieces of debitage and pottery and no features were discerned. We also dug three units along a north-south line a few meters south of the house, just beyond its extended entryway. Here Stranger Creek had developed a natural levee and we hoped gentle overbank flows had buried evidence of outside activities, such as flintknapping or hide and food preparation. In fact, no concentrations of chipping debris, scraping tools, or a hearth were found. Indeed, excavation of each unit to 30-35 cm, below the elevation of the house floor nearby, failed to yield any cultural material.

It is peculiar that a house with an abundance of cultural material and several sub-floor features has so little occupational debris around it. Flood scouring may account for some of this. The house floor was preserved because it was semisubterranean, from 20-25 cm below the adjacent surface, and its discovery was timely. Preservation of the rest of the site appears to have been less fortunate. Still, extramural hearths and pits (the latter were numerous at the Steed-Kisker type site; Wedel 1943) may yet be found at Scott. It is unlikely that they will be found by traditional methods of probing or testing at surface artifact concentrations. Remote sensing methods, beyond the budget of the KAFS and the HPF grant, should be applied in the search for such features.

In addition to the significance of the house, itself sufficient grounds for NRHP eligibility, there is a more deeply buried component at Scott. Evidence of this is a large hearth composed of highly oxidized soil, charcoal, and a few pieces of fire-cracked Sioux quartzite that was discovered by Rolfe Mandel in June 2001 (Figure 7). The feature is exposed on the cutbank of Stranger Creek ca.160 m upstream from the Scott house. It has been incised by a narrow but deep gully and the depths of the burned soil layer differ on either side. On the upstream side of the gully it is 3.0-3.2 m below surface and on the downstream side it is 3.65-3.80 m in depth. It is unclear whether the feature reflects one or two burning episodes. Bill Johnson explored the feature in more detail, collecting soil magnetic profiles and radiocarbon samples. A ^{14}C assay on charcoal from the upstream part of the feature at a depth of 3.00-3.05 m returned a date of

Figure 5. Bifacial tools from the gravel bar at Evans Chute; upper left- side-notched projectile point-knives (PPKs); upper right- unstemmed biface and fragments; lower left- square-stemmed, concave-based PPK and Scallorn arrow point; lower right- corner- or basal-notched PPK

5270±70 BP (delta C13 value= -25.6) (ISGS-5460). Evidence of Middle Archaic activity in the region contemporary with Horizon III at the Coffey site in the Flint Hills (Schmits 1978), this hearth is now the oldest documented occupation in Stranger Creek basin.

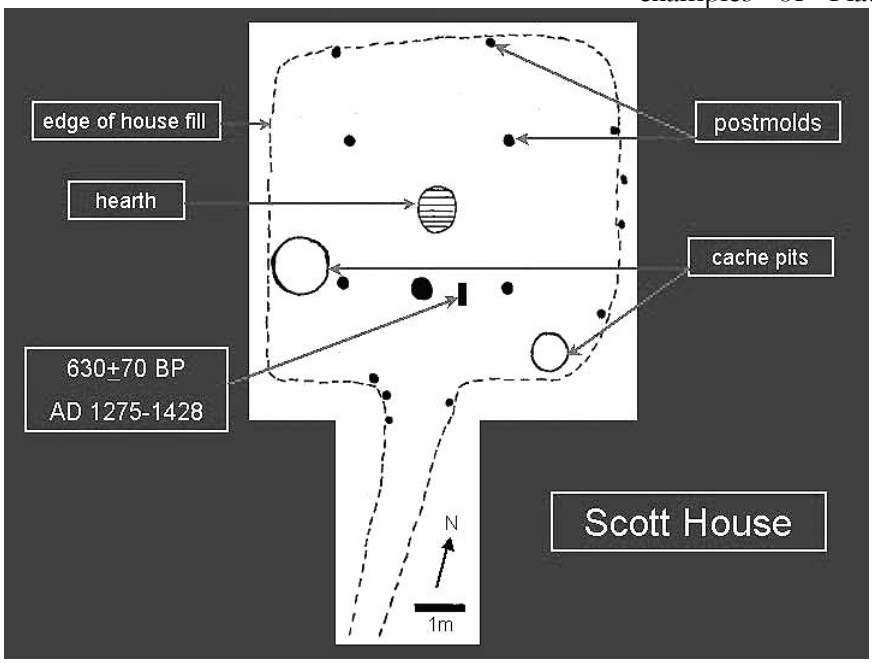


Figure 6. Plan view of the Scott house floor

Paul Site (Figure 7): According to Jerry Paul, the flood of spring 1982 "removed all the tilled soil" along a wash from Little Stranger Creek and exposed a small number of artifacts. His collection from the site includes a few side-and-basal notched arrow points and sherds of Pomona pottery (photographs on file, University of Kansas Museum of Anthropology). During survey of the site that year, we saw only a few pieces of debitage (Logan 1983:79).

When the site area was systematically surveyed by the KAFS on May 19, we saw a few flakes on the surface east of the wash (during a subsequent traverse, Scott collected a single sherd of Pomona ware). Evidence of what may be a buried component was found within the wash in a concentration of chipped stone debris and fire-cracked quartzite. From it we collected a possible hammerstone and 114 flakes (mass=487.5 gm). Of the latter, 110 are Toronto chert and the others are singular examples of Plattsmouth, Mississippian, and unknown cherts, and quartzite. The predominance of Toronto chert debitage from the wash is reminiscent of the piles of that material in the Evans Chute and, like them, may be evidence that occupants of the Evans locality preferred that local raw material.

Caenen Site (Figure 7): This site was recorded as a result of the KAFS following a lead from Scott DeMaranville. When I told him about our findings at the Paul site, Scott said that he had found a few artifacts at the lower end of the wash along which it is located. Scott and I walked that area, recovered a few pieces of debitage, and noted a few pieces of fire-cracked quartzite. When asked if he had ever found cultural material on the surfaces adjacent to the wash, Scott said he had seen only a few flakes. We then walked the field immediately east of the lower wash and noted a concentration of daub, debitage, and pottery. I then led the KAFS students and visitors Lauren Ritterbush and Eli Logan on a systematic survey that delimited the boundaries of the site (or at least its upper component), which are discrete with respect to the nearby Paul site.

We named the site after Henry Caenen, the tenant farmer who has graciously accommodated our fieldwork over the past three

years. I soon learned this was both appropriate and ironic when Scott told me that Henry (who subsequently confirmed this) was among the first to find artifacts in the lower end of the wash. In the mid-1980s it was considerably shallower and a scouring flood had exposed several chipped stone tools to one of Henry's helpers. A journalist of the Tonganoxie *Mirror* who heard about the discovery interviewed Henry and the worker and Scott's reading of the resulting newspaper story prompted him to initiate his surveys of the Evans locality.

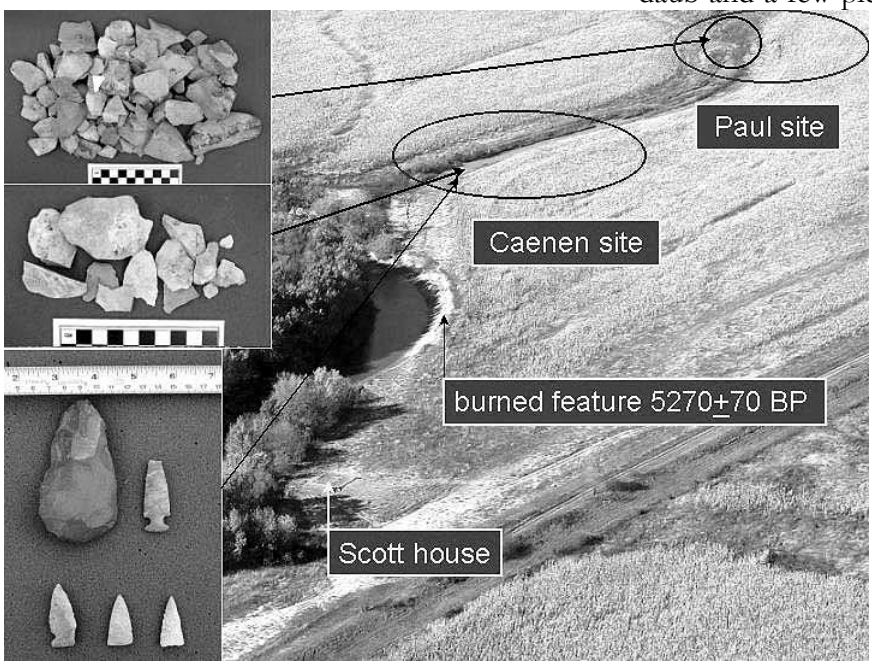


Figure 7. Aerial photograph taken October 2003 showing locations of the Scott site house and burned feature, Caenen site, and Paul site. Insets show artifacts recovered from the wash at the latter two sites during the KAFS surveys. DeMaranville collection from the wash at the Caenen site is lower left

During our survey of Caenen we noted a concentration of daub from the remains of at least one house. The dozen sherds plotted on the surface, all cordmarked and either grog or shell tempered, point to a Pomona affiliation. Other surface finds are the basal portion of an unnotched arrow point of burned chert (Permian?) and two corner-notched dart points of Toronto chert. The latter were found on either side of the wash, though only a few flakes and pieces of daub were noted in the field on the western side. While the dart points may be from an earlier Woodland occupation, such points are not unusual at Pomona sites and may reflect the culture's Woodland origin.

We devoted two days to excavation of three 1x1m test units at Caenen. Each yielded daub and a few pieces of debitage. From one of the two units believed to be within the house itself, we recovered a dozen sherds of Pomona ware, a sandstone shaft abrader, and an arrow point preform of Toronto chert. Most of the daub in each unit was found in the upper two levels with notable decreases from the lower portion of the second through all third levels (Table 2). While this indicates most of the house plaster is within the plowzone, its presence below 15 cm suggests this debris from the structure's roof and walls may rest on a relatively intact floor. During previous traverses of the site area, only a few flakes and no daub or pottery had been seen (Scott DeMaranville, Dick Keck, and Jerry Paul, personal communications, May 29, June 1, and June 13, 2003 respectively). This suggests that recent tilling, fortunately shallow, has exposed the house remains. Caenen, now vulnerable to future plowing, may provide insight to Late Prehistoric relations among groups assigned to different archaeological cultures. I have suggested that associated Pomona and Steed-Kisker wares at sites in Stranger Creek basin reflects the

interaction of two populations in a shared frontier, that is, where their core areas overlapped (Logan 1985, 1988, 1990). The Caenen and Scott house remains and assemblages present an opportunity, perhaps singular, to investigate the relations of these cultures.

Table 2. Mass and Relative Frequency of Daub in Test Unit Levels at the Caenen Site

Unit/Level	148N 84E	150N 88E	156N 88E	Totals
0-10cm	208.2g 40.2%	2072.2g 72.9%	731.4g 36.3%	3011.8g 57.1%
10-20cm	204.1g 39.5%	84.7g 24.1%	1117.4g 55.4%	2006.2g 38.0%
20-30cm	105.0g 20.3%	85.3g 3.0%	167.2g 8.3%	57.5g 4.9%
Totals	517.3g 100%	2842.2g 100%	2016.0g 100%	5375.5g 100%

The artifacts in the wash at the site may be part of a buried component. They may have been associated with a well-developed soil found at ca. 1.5 m in a core extracted at Caenen by Bill Johnson with a Giddings machine. Testing at the Paul site may encounter the same cultural and soil horizons and point to an extensive buried component.

Conclusions and Prospectus

Though analysis of the KAFS data is in progress, the following tentative conclusions are offered:

1) The valley fill in the Evans locality dates to at least ca. 3200-5270 BP, with the younger date derived from a naturally burned feature in a stratigraphic unit exposed in the chute at the Evans site and the older one from a cultural feature on the cutbank of Stranger Creek at the Scott site.

2) The fill contains Late and Middle Archaic components at depths from ca. two to four meters, with the shallower depth represented by debitage piles in the Evans site chute and the greater depth represented by a deeply buried hearth at the Scott site. Middle Archaic side-notched projectile point-knives from the gravel bar in the channel of Stranger Creek at the northern end of the Evans Chute may have been redeposited from the older fill nearby.

3) A Middle Woodland component at the Evans site is ca. 25-45cm below surface. Erosion of the Evans Chute and adjacent fields has deposited lithic tools from that component, primarily at the southern end of the trench. Other diagnostics occur as a lag deposit from that component on the beveled surface adjacent to the western side of the chute.

4) Late Prehistoric components are exposed on the surface at all four sites here discussed and extend to a depth of at least 30 cm. The Scott house had features (a hearth, postmolds, and cache pits) beyond that depth and this may be the case at the Caenen site as well.

5) The Late Prehistoric occupations include both the Steed-Kisker phase and Pomona variant

6) Both the Evans and Scott sites are recommended for nomination to the National Register of Historic Places. This status is warranted because of the stratified nature of their cultural horizons and their potential for contributing to a greater understanding of culture history and change in northeastern Kansas through Archaic, Woodland, and Late Prehistoric time.

Preliminary survey and testing of the Caenen site and recovery of a greater sample of material from the poorly known Paul site indicate these sites deserve NRHP evaluation. Toward that end, the following research goals are proffered:

1) Expand the geoarchaeological database for the Evans locality through the extraction of cores parallel to the Caenen-Paul wash and a transect from there to the Scott site. Determine the extent of the buried soil detected at Caenen.

2) Locate buried components at both sites, define their horizontal extent, and determine their age(s). Are these associated with paleosols that reflect periods of floodplain stability in Stranger Creek valley? Test the hypothesis that the presence and ubiquity of Toronto chert debitage in the wash at both Paul and Caenen reflect Late Archaic procurement comparable to that tentatively inferred from the buried debitage piles at the Evans site.

3) Excavate the Caenen house, which is threatened by plowing, in order to verify its suggested cultural affiliation (Pomona variant), determine its age and configuration, document any features, and record and recover its associated artifact assemblage.

4) Compare the Late Prehistoric assemblages from Scott and Caenen in order to verify or reject contemporaneity (within the limits of radiocarbon dating) and to find evidence that Late Prehistoric groups of different material cultures (and ancestries?) were in contact in northeastern Kansas. Determine the nature of relations between these groups.

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Kansas Archeology Training Program Field School, 2003

Virginia A. Wulfkuhle, Public Archeologist, Kansas State Historical Society

The Kansas Anthropological Association and the Odyssey Archaeological Research Fund at the University of Kansas formed a partnership to carry out the 2003 Kansas Archeology Training Program field school, July 12-20, at the Claussen site (14WB322) in Wabaunsee County. Landowner Dr. Verne Claussen of Alma generously granted access to the site. Two components of the site were investigated, one dating to Late Paleoindian/Early Archaic and the other to the Ceramic period.

Rolfe Mandel and Jack L. Hofman of the University of Kansas were principal investigators on the lower component. KU graduate students Chris Widga, Shannon Ryan, and Kale Bruner served as site supervisors. Donna Roper of Kansas State University and Virginia Wulfkuhle directed the upper component work, and Martin Stein guided a survey of stream cutbanks in the Mill Creek valley. The follow three articles overview the findings of these efforts.

During the nine-day field school and the following day (July 21), 93 volunteers contributed

3,581 hours of skilled labor to the project. Still, the upper component required another 535 hours from 22 volunteers to excavate the exposed cultural features, bringing the total number of donated hours to 4,116.

In addition to the excavations, other essential elements of the field school were the artifact processing lab and classes. Christine Garst, Anita Frank, and Mary Conrad supervised lab workers, and Anita managed the project records. Classes were taught by Jean Howell (orientation and Principles of Archeology), Tim Weston (Basic Archeological Excavation), Will Banks (Kansas Prehistory), and Bert Wetherill (Introduction to Lithic Identification Techniques).

Evening programs included a barbecue provided by Alma Chamber of Commerce in Alma City Park; "Wabaunsee County Territorial History," a talk by Michael Stubbs; Collectors Night; bus tour of the Claussen Site; musical jam session at KOA Campground in Paxico; and resume and supper with meal provided by the businesses of Paxico.

Preliminary reports of the project were published in Volume 25, Nos. 1, 5, and 6 of *Kansas Preservation*. Chris Widga and Jack Hofman prepared a poster session about investigations on the lower component for the Plains Anthropological Conference in Fayetteville, Arkansas, in October 2003. Donna Roper will produce a technical report on the upper component under contract with the KAA.

The 2003 Odyssey/KATP Excavations at the Claussen Site (14WB322)

Chris Widga and Jack L. Hofman, University of Kansas

The Claussen site is a deeply stratified site located in T-2 deposits of Mill Creek, near Paxico, Kansas. Since its discovery in 1999, the Claussen site has been periodically visited by University of Kansas and Kansas State Historical Society personnel, when surface artifacts have been mapped in place and collected. During the summer of 2003, the Kansas Anthropological Association hosted its annual field training program at Claussen (KATP), providing the opportunity to examine larger areas of both the Paleoarchaic and Late Prehistoric components.

At least four components have been defined at the Claussen site ranging in age from historic to possible Clovis-age. The 2003 joint Odyssey/KATP investigations focused on the late prehistoric component on the surface of the T-1 fill (810±70), and a lower Paleoarchaic component (8800±150 RCYBP).

In the lower component, a total of 11.5 1x1 m units were placed along 25 meters of the Mill Creek channel. The upstream units yielded an abundance of cultural materials distributed throughout the uppermost Paleoarchaic horizon. The downstream units were placed on an eroded segment of the original surface, and 5 of these units were excavated to the water level. Most of the cultural materials in this area were distributed throughout talus deposits. Both areas had high numbers of gastropods.

There are 185 mapped items from the Paleoarchaic component including: chipped stone, bone, shell and charcoal samples. Notable peaks in the vertical distribution of cultural materials and the absence of obvious sorting based on size, shape or material suggests that the spatial integrity of this component is relatively intact (Figure 1). Vertical and horizontal concentrations of charcoal and burned earth,

(i.e., a possible burned feature), were noted in unit 32R-25. Burned bone was also common in this unit.

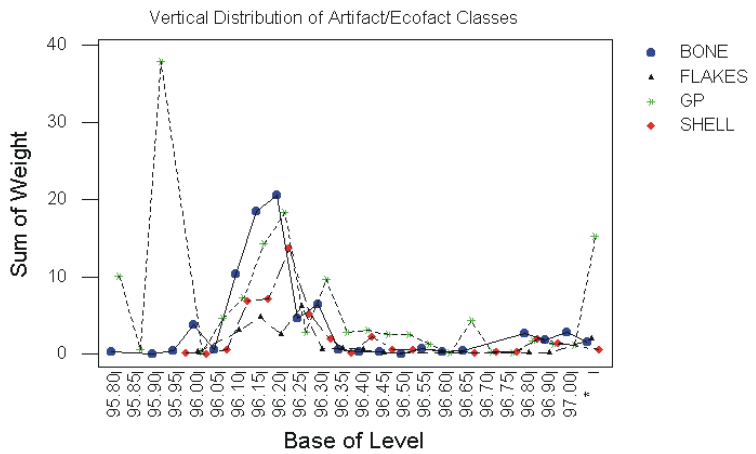

Figure 1. Vertical Distribution of Artifact Classes in 32R-25

The Archaeofaunal Assemblage

A variety of vertebrate and invertebrate species were recovered during the 2003 investigations (Table 1). Medium ungulate taxa (*Odocoileus* or *Odocoileus/Antilocapra*) were the most common economic species, however avian species, notably *Meleagris gallopavo*, also made up a significant portion of the archaeofaunal assemblage. Bison (species indeterminate), *Vulpes velox*, lagomorph and rodent taxa are all represented by single individuals and low NISPs. Preliminary identification of the mussel fauna indicates the presence of three species: *Amblema plicata*, *Quadrula quadrula*, and *Fusconaia flava*.

Burned bone specimens make up 23% of the mapped faunal sample and 37% of the bone recovered in the screens from 32R-25, the most productive unit. Burning on both the interior and exterior of bone fragments suggests that most heat modification occurred post-consumption.

The Chipped Stone Assemblage

No diagnostic artifacts have been found within the 8,800 year old component(s). Diagnostic Dalton and lanceolate projectile points have been found in the stream gravel below the site.

Lithic materials identified to date are all derived from local or nearby sources of Permian (Florence) formation cherts.

The occurrence of refits (Figure 2), the wide range in sizes and shapes of recovered pieces, and the lack of evidence for edge abrasion or stream rolling suggests that post-depositional alluvial transport has not been significant.

The few tools identified include two modified flakes and three flaked and battered cobbles (core/hammers). All are expedient tools that were made, used, and discarded at the site. One flake tool refits with one of the cobbles, which was apparently collected from the stream gravel in Mill Creek.

The high proportion of flakes which have platforms (75% platform remnant bearing based on piece plotted and ¼" screen samples) indicates that post manufacture breakage due to factors such as trampling has been minimal. This suggests an occupation or activity area usage of relatively short duration.

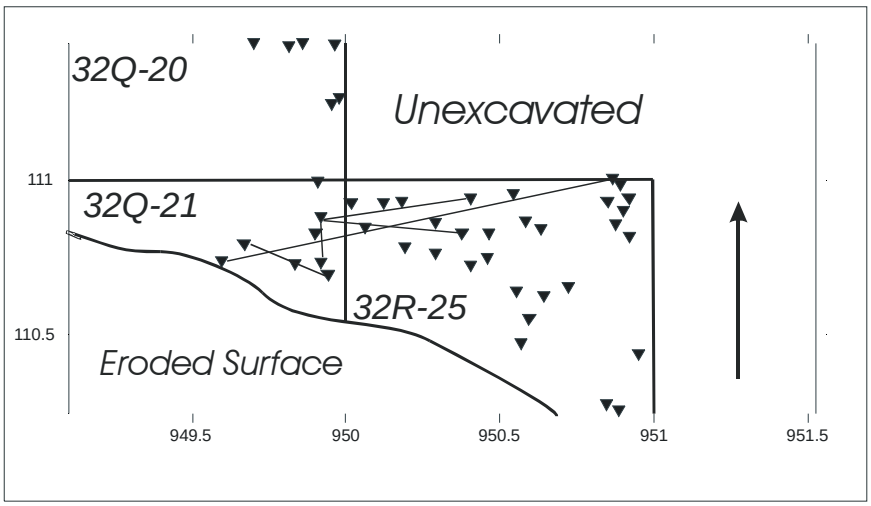

Figure 2. Refitted Chipped Stone Specimens

The rarity of burned lithics (n=5, 6% of piece plotted and ¼" sample), which does not include the large core/hammers, suggests that burning of lithics was incidental and related to hearths rather than to general surface fires or natural burns.

The presence of late stage thinning and retouch flakes from bifaces indicates that tools were present which have not been recovered. In addition to flake tools, bifacial knives or projectile-point/knives were apparently used and resharpened, or possibly manufactured, at the site.

Summary

Limited testing undertaken at the Claussen site in July of 2003 indicate that, at least in parts of the site, there are intact cultural deposits dating to about 8800 BP. Chipped stone, mussel shell, gastropods, charcoal and vertebrate fauna were recovered. Preliminary analysis of the chipped stone assemblage suggests a short-term occupation where local Permian chert sources were emphasized. Deer, turkey, and mussels made up a large portion of the identifiable fauna.

While almost all inferences regarding the function and spatial organization of the Claussen site must remain tentative at this time due to the small, excavated sample, material recovered in 2003 has allowed us some insight into subsistence and technological parameters of Paleoarchaic groups occupying the Prairie-Plains border. Future analyses will focus further testing of the lower Paleoarchaic components, as well as determining site seasonality, and refining interpretations of technological processes evident within the extant artifact assemblage. These studies will complement ongoing geochronological investigations of Dr. Rolfe Mandel.

Acknowledgements

Support for the 2003 excavations at the Claussen site was provided by the Odyssey Geoarchaeological Research Fund, Kansas State Historical Society and the Kansas Anthropological Association. Shannon Ryan, Kale Bruner, Rolfe Mandel, Virginia Wulfkule, Anita Frank, Darcy Morey, Elizabeth Beavers and Dr. Verne Claussen also contributed in a variety of ways to the success of the Claussen investigations. Finally, this would not have been possible without the persistent and ever-cheerful cadre of volunteers who gave their time and expertise during the hottest week of the summer.

14WB322 Upper Component

Donna C. Roper, Kansas State University

The archeological record at the Claussen site (14WB322) in Wabaunsee County's Mill Creek valley spans much of the prehistoric period, from the late Paleoindian/early Archaic to a series of Ceramic period occupations. Like the older remains, the younger materials are buried beneath flood-deposited sediment. Therefore, while we do not really know how extensive this more recent archeological record is, we do know that artifacts, rock from hearth features, and mussel shells are exposed at two places along the Mill Creek cutbank. Part of the summer 2003 Kansas Archeology Training Program field school effort was directed toward testing these upper, younger cultural horizons.

At the northern of the two places where material is exposed, it actually appears that no fewer than five cultural horizons are stacked one above another. They are separated from each other by sediments laid down by repeated flooding, with a total thickness of the deposits from surface to lowest observed horizons measured at about 4.5 meters. It was obviously impractical to attempt to reach any but the uppermost of these cultural horizons during the nine-day field school. That horizon is slightly less than a meter below the present surface, so a backhoe removed overburden in a block set a short distance back from the cutbank. Hand excavation in five 1-x-1 m squares followed and went completely through the cultural horizon. The few artifacts recovered include several small ceramic body sherds that place the occupation in the Early Ceramic period but provide no more specific indication of cultural affiliation. The nature of the occupation was not apparent.

The situation was quite different at the southern of the two places where material is exposed on the cutbank. Here, a single cultural horizon was observed extending for perhaps 8 meters or so along the bank. A previously obtained radiocarbon age (810±70 rcybp) suggested an occupation in the Middle Ceramic period or, more specifically, in the late twelfth or the thirteenth century (calibrated dates). The specific cultural affiliation was not identifiable from the few artifacts recovered from the cutbank, however, nor was it known what whoever occupied this site was doing there. Because the location was an active floodplain at the time of the occupation and some of the material observed on the cutbank was mussel shell, a good starting guess was that the site represents a short-term occupation during which mussels and perhaps other fauna from Mill Creek were used. A good horizontal exposure was needed to more fully document this. This cultural horizon was buried beneath about 2½ meters (over 8 feet) of flood sediments, so a backhoe removed overburden to a point just above it, and hand excavation proceeded from there. An area of about 22 square meters eventually was excavated during the nine-day the field school, a tenth day in July, and 11 more fall weekend days ending November 1.

The exposed area held extensive evidence of in-place burning and yielded a large amount of faunal material, accompanied by a modest quantity of artifacts. The faunal assemblage is indeed dominated by resources from Mill Creek. Mussels, many of them quite large, are abundant, and fish also were well represented. Turtle was present. Waterfowl, or birds of any kind, seem to be absent. A small amount of mammal bone is very poorly preserved and will not be identifiable.

James Theler (1987:54-55) has written that only two ways of processing these resources are feasible: breaking open the shell with a rock or other heavy object or steaming them open. Because the Claussen site shells are whole and largely undamaged, the steaming method must have been used here. The evidence for burning is consistent with this. Rather than a single pit or basin, though, the complex burn pattern suggests fires built on the surface or in shallow depressions, probably with wet grass used to cover the mussels to steam them. In fact, charred grass stems are tentatively identified among the extensive amount of charcoal recovered. The fish could have been cooked along with the mussels.

The artifacts included both pottery and chipped stone objects. Several dozen pottery sherds appear to be from a single vessel. That is a shell-tempered bowl with incised decoration on the shoulder. A short, solid cylindrical handle has a simple representation of a human face on the end (Figure 1). As this is an area where food was cooked directly in the fire, one might wonder what a pot—and possibly a special vessel at that—was used for? A good guess would be to boil corn that might have been brought with the people who used this site. Residues were collected from both the interior and exterior of the vessel and will be analyzed to determine if this guess is correct.

The chipped stone artifacts include several small arrow points, a few drills, some large flakes that were modified to produce single-use tools, and unmodified, mostly small flakes that tended to occur in clusters and probably represent individual episodes of tool-making or repair. The drills are particularly interesting as they are not common on Middle Ceramic period sites used over a period of years, yet at least three of them were lost or discarded on this short-term-use site. Their function here is another question to be addressed during the analysis.

The types of artifacts found should allow us to determine cultural affiliation, but in this case they do not. Pottery usually is the best indicator. Here, however, while the effigy is of a form known from some northwest Missouri sites—and may be the first of its kind reported in Kansas—shell-tempered pottery, including vessels with shoulder-incised decoration, is found over a large area of the upper Midwest and eastern Plains and as far west in Kansas as the Salina/ Minneapolis area. It is not unique to any culture defined in the region. In fact, it will be pertinent to compare paste and temper characteristics with shell-tempered and grit-tempered pottery from over a wider area to see if this vessel is an import or a local copy.

Figure 1. Field Photograph of the Ceramic Effigy

While the chipped stone tools are not unique to a specific Middle Ceramic period taxon, the raw material, Permian chert from the Flint Hills, may provide some clue to who was here. Chipped stone tools in the Smoky Hill phase sites in an area from around Manhattan to Salina/Minneapolis are usually made of Flint Hills cherts, and shell-tempered vessels sometimes occur in these sites as well. The popular perception of these house sites is that people were settled at them year-round and that they relied on bison, deer, and other mammals, along with corn and several other crops. While

this is not totally wrong, it is increasingly recognized that the subsistence base was more diverse and that fish and mussels were important in the diet. We also are now starting to sense that people at this time did move around some. We do not yet understand this very well, however, and the Claussen site excavation provides some of the best evidence to date for what Middle Ceramic period people of eastern Kansas were doing away from their farms.

Note: With some minor changes, this article also appears in Kansas Preservation*, Vol. 25, No. 6, 2003.*

Reference Cited

Theler, James
1987 *Woodland Tradition Economic Strategies: Animal Resource Utilization in Southwestern Wisconsin and Northeastern Iowa.* Report 17. Office of the State Archaeologist, University of Iowa, Iowa City.

The Survey

Martin Stein, Kansas State Historical Society

The survey component of the 2003 Kansas Archeology Training Program field school, which was carried out from July 13 to July 19, focused on locating cutbanks (or sections) along Mill Creek and its tributary streams and examining them for buried archeological features. Mill Creek is a southern tributary to the Kansas River located in Wabaunsee County, Kansas. Its headwaters are found in the southern part of Wabaunsee County along the divide that separates the watersheds of the Neosho and Kansas rivers. The three main branches of Mill Creek, called the West, South, and East, flow in northerly directions to the Alma vicinity, where they unite to form the main stem. A short distance north of Alma, Mill Creek takes an eastward turn and continues in that direction past the communities of McFarland and Paxico for approximately 14 miles to a point near Maple Hill, where it once again turns north and empties into the Kansas River.

The method employed for this survey was to first examine 1991 aerial photographs of the course of Mill Creek to identify possible cutbanks, which appeared as gaps in the tree lines along the creek margins. In the field these gaps proved to be the relatively "clean" and vertical cuts that provide the best conditions for seeing archeological features. (One site was found below a bank with trees, however.) Landowners were then contacted for permission to examine the cutbanks identified through study of the aerial photographs. Some landowners also volunteered information about other cutbanks on their properties. The survey was conducted with the advice and assistance of Rolfe Mandel of the Odyssey Archeological Research Fund, Kansas Geological Survey, University of Kansas.

Some cuts could be approached overland and a path found or cut down to reach the face of the bank. Others were reached by water, using at various times a canoe, a johnboat, and a kayak. The face of each cutbank was searched for charcoal, mussel shell, stones, or artifacts sticking out of the bank. If such items were seen, a square or rectangular area surrounding the exposed item was shaved with a trowel to provide a clean view of the soil. Troweling thus exposed concentrations and showed the horizontal and vertical dimensions of the feature. Individual items or artifacts fallen from above and resting on more gentle slopes also were

positively identified by troweling. A number of sections had surface sites located above them, and in some instances stone flakes or chipped stone tools were found on the cutbanks below, but these were artifacts out of context. Maturing soybeans and corn crops obscured the ground surface in most cultivated fields, so it was not possible to accurately gauge the size of surface sites or to do a systematic collection of artifacts from them. However, surface sites associated with cutbanks were included in the site recording.

The survey concentrated on the main stem of the creek, but three cutbanks on the South Branch, three on the West Branch, and two on Spring Creek (a western tributary of the West Branch) also were surveyed. A total of 26 cutbanks were examined, and archeological features were found in 5 of them: 4 on Mill Creek and 1 on the South Branch. One section had three stratified features; the other sections each had a single feature, for a total of seven buried archeological features. The features were primarily mussel shell concentrations, but other materials, such as burned earth, possible fire-cracked rock, and turtle shell, were sometimes present.

The five buried sites were recorded, as well as four surface sites. No diagnostic artifacts were found in the buried sites, but Mandel's preliminary evaluation of three of the cutbanks suggested that two sections are between 5,000 and 7,000 years old. A site located in the Honey Creek soil member probably dates to the Late Archaic or Early Ceramic Period, approximately 2,000 years ago. The cut containing three stratified features within the Gunder member and another site that has a mussel shell concentration located deep within the section just above a gray clay at the waterline probably also are affiliated with the early part of the Archaic Period. Neither has yet been examined by Mandel, so the age estimate for these sites is unconfirmed. One surface site is affiliated with either the Late Archaic or Early Ceramic period, based upon projectile point styles that came from its surface.

Many of the cutbanks that were examined were obscured to a greater or lesser degree by soil slumping and vegetation growth. The fact that archeological features were not seen at some cutbanks during this survey does not mean that these banks have no future potential. A period of heavy rainfall in the Mill Creek drainage could clean the cutbanks of slumped soil and vegetation and provide a clean "window" into the accumulated soil. The cuts on the main stem, in particular, could be reexamined at such a time.

Pitfalls in Typological Classification and Pattern Recognition Research: A Case Study Involving Two Paleoindian Projectile Point Isolates from Kansas

Janice McLean, University of Kansas

Distributional studies based on diagnostic Paleoindian surface artifacts have become popular adjuncts to the study of excavated site assemblages (Beaver 1998; Blackmar 1998, 2001; Brown and Logan 1987; Hofman 1994; Hofman and Hesse 2002). Distinctive fluted and stemmed projectile point/knife isolates sorted by type have served as the baseline data in several pattern recognition studies involving Kansas Paleoindian landscape and lithic resource use (e.g., Blackmar 1998, 2001; Hofman 1994; Hofman and Hesse 2002; Holen 2001).

Unfortunately, not all Paleoindian point types are so easily classified. Examples of concave-based lanceolate points with variable flaking patterns, e.g., Goshen / Plainview / and early stage Dalton points, among others, have become classification challenges at many sites in the Great Plains (e.g., Bamforth 2002; Frison, Haynes and Larson 1996; Hofman 1996; Irwin-Williams *et al.* 1973; Knudson 2002). Such types have proven more difficult to incorporate into pattern recognition research, with the consequence that their unknown distributional extent leaves major gaps in our understanding of Paleoindian landscape use.

Published accounts of Paleoindian isolates serve as one key source of data for distributional / pattern recognition research on the Paleoindian occupation of Kansas (e.g., Banks and Stein 2000). Additional unpublished data is stored in the Kansas State Historical Society's archaeological site file and also with Jack Hofman at the Department of Anthropology, University of Kansas–Lawrence (Hofman, Logan, and Adair 1996:209-210). This paper adds two artifacts from private collections to the published record of projectile point isolates.

Both points reported here possess morphological attributes that make them difficult to classify into a single established type. However, since a type assignment is a prerequisite for their successful inclusion in distribution research, I realized I had to try to overcome this obstacle for the information to be of use to Paleoindian researchers. Sometime during this pursuit, it finally hit me how profoundly the act of making a type assignment shapes and distorts our understanding of the Paleoindian record, and how my experience working with these two examples could serve as a case study to that effect. Problems related to Goshen, Plainview, and Dalton–the types directly involved in this artifact classification exercise–are outlined, and an attribute scatterplot technique for dealing with type-resistant specimens is introduced. Final comments critique the practice of using diagnostic artifact type counts as the baseline organizational structure in pattern recognition studies.

Artifact Descriptions

Rintoul-01

The first artifact (Rintoul-01) is a complete lanceolate projectile point discovered in 1995 on a gravel beach at River Pond State Park by David Rintoul, Associate Professor of Biology, Kansas State University–Manhattan. The author and Holly Raab met with Rintoul on July 26, 2003 at the Tuttle Creek Lake Headquarters to record the specimen in conjunction with a Phase II survey project at Tuttle Creek Lake funded by the Army Corps of Engineers. The artifact was digitally photographed and documented according to the standardized format used by the University of Kansas Great Plains Paleoindian Projectile Point Survey (cf. Wetherill 1995:A-2)[1]. During the initial recording session, the point was tentatively identified as a Dalton point, although considerable overlap with the Plainview type was also noted.

The Rintoul projectile point (Rintoul-01) is a complete concave-based lanceolate manufactured on a bifacial preform (Figure 1a,b). The stem has one straight and one very slightly incurvate edge with one straight and one slightly excurvate blade margin. The base is heavily ground but the lateral margins are only lightly ground up to a maximum of 18.7 mm from the base. The right lateral margin (Figure 1a) above the point of edge grinding has been slightly beveled, indicating that point was resharpened while hafted. The blade

[1] All original artifact documentation is on file with Jack Hofman, Dept. of Anthropology, University of Kansas–Lawrence.

edges are also lightly serrated. The flaking pattern varies from non-patterned invasive flaking on Side A to serial transmedial terminations on Side B. The lithic material is a fossiliferous gray chert that compares favorably to locally available Permian chert from the Florence Limestone Member of the Barneston Formation. The dark brown & tan discoloration visible on both sides of the specimen is a dark patina common to artifacts found in fluvial contexts. Specimen attributes measured to the nearest 0.1 mm include: **Specimen Length**: 76.7; **Specimen Width**: 20.7; **Base Width**: 22.6; **Tip Thickness** (from 1 cm below tip): 5.6; **Maximum Midsection Thickness**: 6.1; **Base Thickness** (from 1 cm above the maximum basal depth): 4.5; **Basal Concavity Depth**: 4.0; **Weight** (g): Not Available.

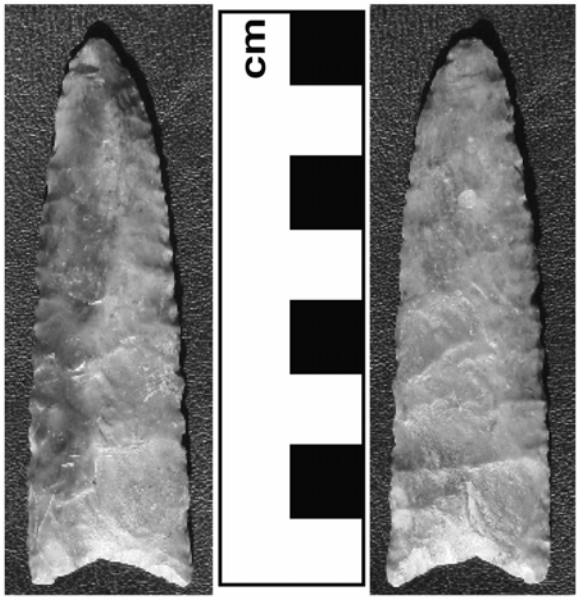

Figure 1. Digital images of Rintoul-01 scaled to actual size using Photoshop

14WCTEMP-134

The second artifact (14WCTEMP-134) is from Phillip Bussen's private collection[2]. This particular specimen was first recorded for the University of Kansas Great Plains Paleoindian Projectile Point Survey by the author and Jack Hofman on 5/23/1995 at the home of Jerome Bussen in Wallace, Kansas. In 1995, based on its association with a handwritten note containing locational data, this specimen was recorded as being from 14WC76. In early January 2003, while recording some supplemental data on the specimen, we finally realized that the note had inadvertently been recorded as associated with 14WCTEMP-134 during the 1995 documentation session, and that the note actually belonged with a Clovis point recorded at the same time. That Clovis point, once Specimen No. 14WCTEMP-133 (McLean 2002:65, Figure 1A), is now 14WC76/0001. On January 6, 2003 I met with Phillip at his home in Wallace, Kansas in an attempt to clarify the provenance of 14WCTEMP-134. However, at that time Phillip could only remember that he found the point somewhere in Wallace County, Kansas. A line drawing of side A of this specimen, identified in the figure caption as a Goshen point, was included in a recent summary of Paleoindian artifacts found during the Fort Wallace Dornic Club surveys in Wallace and Logan Counties (McLean 2002:65, Figure 1C). Goshen points also overlap technologically with Plainview points (Bradley and Frison 1996), but because they occur in pre-Folsom contexts in the Northern Plains and post-Folsom contexts on the Southern Plains, the exact nature of the relationship continues to be the subject of much debate (Kornfeld and Frison 2000:131).

The lithic material used to manufacture specimen 14WCTEMP-134 is opaque reddish brown jasper that compares favorably to the

[2] Phillip Bussen is a nephew of Jerome and Richard Bussen who participated in many archaeological projects associated with the Fort Wallace Dornic Club (FWDC), a group of avocational archaeologists loosely affiliated with the early Kansas Anthropological Association that met in Hays, Kansas (McLean 1996). Rather than merge his artifact finds with FWDC collection curated by his uncles, Phillip chose to keep and organize his own substantial collection. It mirrors the FWDC collection in many ways.

finest quality Niobrara Jasper, but it lacks the minute chalk particles that would secure identification based solely on macroscopic criteria. Table Mountain red jasper is an alternative, albeit speculative, candidate based on published descriptions and well-documented Paleoindian utilization (Kornfeld and Frison 2000; Naze 1986:27). This material originates in Miocene-age basalt flows at Table Mountain and possibly Grouse Mountain in the Middle Park section of the Colorado Rockies. It can also potentially be found in gravel deposits associated with the ancient Colorado River drainage network (Kornfeld and Frison 2000:132). However, until samples of Table Mountain red jasper have been obtained and directly compared to the actual 14WCTEMP-134 specimen, it is properly regarded as having no lithic material source identification at all[3]. Other potential sources of red jasper/chert do exist, and while some can be ruled out based on macroscopic criteria, others may prove more difficult to eliminate from consideration (Naze 1986:27).

Specimen 14WCTEMP-134 is a concave-based lanceolate stem / blade fragment with an extensively reworked, but unbeveled, distal blade remnant (Figure 2a,b). The distal blade margin exhibits an oblique bending fracture, a common break type that can occur at almost any stage in an artifact's use-life (Whittaker 1994:165), but appears to have occurred at the very end for this exhaustively utilized tool. The point was retipped while still hafted, apparently multiple times since the tip angles are very steep, and the tip is essentially congruent with the stem with very little blade intervening. Edge grinding occurs right up to the point of reworking / fracture on both lateral margins. Flaking patterns differ on each side. Figure 2a exhibits an alternating sequence of three transmedial parallel flake removals executed at right angles to the long axis of a late-stage bifacial preform prior to final shaping and basal thinning. In contrast, the flake pattern shown in Figure 2b is better characterized as random, a term rejected by some lithic analysts in favor of *selective sequencing* (Bradley 1997:44-45). Basal thinning on side B also occurred during the final stage of manufacture, as did the lateral and basal grinding. Attributes measured to the nearest 0.1 mm for this specimen include: **Specimen Length**: 31.8; **Specimen Width**: 24.8; **Base Width**: 22.2; **Maximum Thickness**: 4.1; **Basal Concavity Depth**: 1.6; **Weight** (g): 4.5.

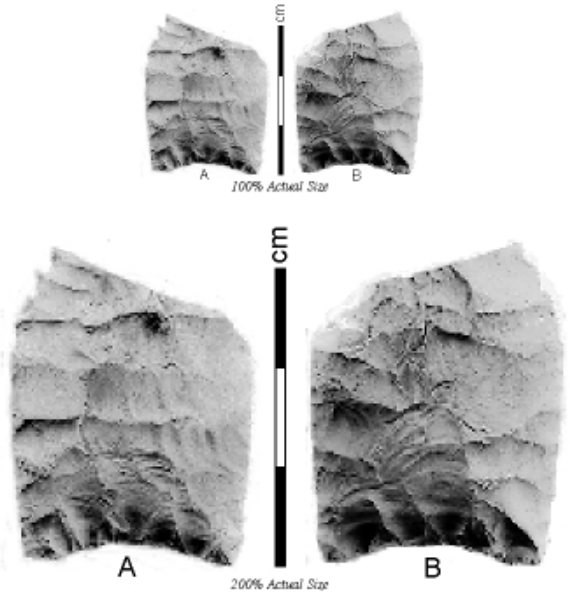

Figure 2. Front and Back views of 14WCTEMP-134 at 100% size to show scale, and at 200% size to show flaking detail. The source images, scanned 35mm color slides, were cropped, resized, converted to grayscale, inverted, auto leveled, and sharpened using Adobe Photoshop's Unsharp Mask filter before final composition in Freehand 10. This digital process produces a negative effect once only achieved in artifact photography by lightly dusting artifacts with aluminum powder before photographing them in black and white

Discussion of the Rintoul-01 and 14WCTEMP-134 Type Identifications in Relation to Conventional Wisdom Regarding the Goshen, Plainview, and Dalton Types

Some archaeologists argue that Goshen-Plainview points are simply an early northern manifestation of a long-lived type tradition that stratigraphically precedes Folsom on the Northern Plains and ends up outlasting Folsom on the Southern Plains (Kornfeld and Frison 2000:144). However, there is clearly no universal consensus on, or even interest in, the subject of Goshen-Plainview relationships among Plains archaeologists. For instance, the Goshen taxon is not even mentioned in several recent Southern Plains studies (e.g., Ballenger 1999: Hatfield 2001:54-55), or in a prominent Texas type identification guide (Turner and Hester 1999). Goshen is a construct created, debated and kept alive by Northern Plains researchers based on scant stratigraphic evidence from the Hell Gap site, a more substantial single component site (Mill Iron), and data generated by on-going investigations in the Middle Park section of the Colorado Rockies (e.g., Frison, Haynes and Larson 1996:206; Irwin-Williams *et al.* 1973; Kornfeld and Frison 2000). However, recent radiocarbon dates might eventually change the perception that the Goshen can just be ignored outside the Northern Plains. Dates on bison bone from a Goshen bonebed at the Upper Twin Mountain Site (5GA1513) overlap with some of the oldest Plainview dates (Kornfeld and Frison 2000:144). A series of 10,200-10,000 RCYBP dates from the Jim Pitts Goshen site in South Dakota (Ray 2000:42) bring the complex in line with average Plainview age determinations of 10,000 RCYBP at the Lubbock Lake site in Texas (Kornfeld and Frison 2000:131).

The generic term Goshen-Plainview (Bradley and Frison 1996) would make sense as a typological designation for the 14WCTEMP-134 specimen, but what exactly, if anything, does that mean? A composite Goshen-Plainview typological construct spans several millennia and has a spatial distribution that encompasses the entire Great Plains plus portions of adjacent border regions including both mountain and woodland environments. The fact that the artifact is made of homogeneous red jasper foreign both to Kansas and the Southern Plains supports the original (northern) Goshen assignment for this particular artifact . . . but, doesn't that makes it the only publicly documented Goshen point in a state where Plainview points are considered fairly common (Brown and Logan 1987)?

Both Dalton and "Plainview" points have been recovered from gravel bars in the lower Kansas River basin (Rogers and Martin 1983; Wetherill 1995), as surface finds in Kansas (Brown and Logan 1987; Weston 1993), and in buried, albeit redeposited, context at the DB Site (14LV1071) in the lower Missouri River uplands (Hatfield 1998; Logan and Johnson 1997). The Laird Site (14SN2), a bison kill located in Sherman County, Kansas, is thus far the only excavated single-component Dalton site in Kansas. Bison bone from the site has been AMS dated to 8,495±45 years B.P. (CAMS-82397) (Blackmar 2002) or 9,506+22 calBP. This is several hundred years younger than the proposed age range of 10,500-9700 B.P. for Dalton in the Southeast (Hofman 1996:75), or the 10,200-9700 calBP age range estimate for Zone 88 Dalton assemblage at the Red Smoke site in southwestern Nebraska (Knudson 2002:96). The relative ages, duration and validity of the Goshen/Plainview complexes are part of a long-standing debate, but further research into the age of all three complexes in the Central Plains is clearly in order. Unfortunately, these two finds have no potential to yield datable material or stratigraphic context relevant to this debate.

Both of the artifacts documented herein were assigned reasonable type identifications during their initial documentation process based on morphological similarities to illustrations, and textual descriptions of Goshen, Plainview, and Dalton types (Bradley and Frison 1996; Bradley 1997; Hartwell 1995; Hofman 1996; Irwin-Williams *et al.* 1973; Knudson 2002; Krieger 1947; Myers and Lambert 1983; Morse 1997). However, additional research caused me to question both conclusions based on those identifications as well as the identification process itself. A closer look at the similarities between the Goshen, Plainview, Dalton types is needed to establish how these types overlap before beginning to think about what that overlap might mean for Paleoindian research in general, and pattern recognition research in particular.

According to archaeologists familiar with the both the Mill Iron and Plainview assemblages, Goshen and Plainview points are technologically identical concave-based lanceolate points with ground lateral edges and basal thinning. Both types exhibit great variability in flaking patterns, base, stem, and blade shapes (Frison, Haynes, Larson 1996:205-207; Hofman 1996:64). Arguments that Plainview type site points tend to be made on thin flake blanks rather than on bifacial preforms (Knudson 1983, 2002:119-121) have persisted despite evidence that Ryan's Site Cache Plainview points are manufactured more often from bifacial preforms than on flake blanks (Hartwell 1995:176). Both manufacturing trajectories should be expected for both types. In contrast, Dalton points begin as bifacial preforms. They become concave-based lanceolates that develop progressively indented stems due to lateral blade and stem beveling, margin serration, and serial pressure flaking. Technological fluting and extensive basal thinning are also common, and the end forms of the Dalton multi-stage type are highly distinctive (Bradley 1997). Unfortunately, during the preform to intermediate stages, Dalton points resemble Goshen-Plainview points (Bradley 1997:54, 57).

The major alleged difference between the Goshen-Plainview and their look-alike Dalton counterparts is that Goshen-Plainview points are supposed to lack any evidence of margin beveling, serration, or technological fluting (Bradley 1997:57). However, others counter that "Meserve" beveled points/knives are actually late stage lanceolate points easily subsumed within either the Dalton or Plainview types (Hofman 1996:75; Turner and Hester 1999:154). The true extent of variation in attributes like blade beveling in Goshen-Plainview samples is actually a contentious issue since some points classified as Plainview exhibit blade beveling (Hatfield 2001:224) and Meserve (or "Meserved") points are commonly identified constituents of both Central and Southern Plains Paleoindian artifact assemblages (Hofman 1996:74-75). Goshen-Plainview points are not described as serrated, but neither are all Dalton points, especially ones in the early stages of manufacture / use (Morse 1997:21). Dalton points are also described as technologically fluted, but this characteristic only has typological significance in cases where evidence of fluting has not been removed by serial pressure flaking (Bradley 1997:55).

The Rintoul-01 point was tentatively assigned to an initial stage of the multistage Dalton type because of its concave-based lanceolate morphology and slightly beveled right blade margin (Myers and Lambert 1983:110). However, the specimen lacks the pronounced incurvate stem / excurvate blade argued to be an integral part of the completed preform / initial stage Dalton type as defined by Myers and Lambert (1983:110). Furthermore, an indented stem (Dalton) vs. straight stem (Goshen-Plainview) distinction (Myers and Lambert 1983:111) is complicated by the existence of indented stem

Plainview points from Perry Ranch (34JK81) as well as the Plainview type site (Johnson 1989:47-48). The single Goshen point from Hell Gap, the Goshen type site, also exhibits an indented stem-excurvate blade with a deep basal cavity that looks very Dalton-like (Irwin-Williams 1973:Figure 4.1), as do several Goshen points from the Mill Iron site in Montana (Bradley and Frison 1996:Figures 4.1f and 4.3c). Blade / stem shape attributes are clearly not useful as diagnostic criteria for these types.

Flaking pattern has also been proposed as a diagnostic non-metric attribute by Bradley (1997), who distinguishes between serial (Dalton) vs. well-spaced selective [random] (Goshen-Plainview) pressure flaking. I feel this is a very subjective distinction, and one that is difficult to observe without access to original specimens, casts, or high quality images. In another context, Bradley characterizes Goshen points as having "well controlled and evenly spaced pressure flake scars that include comedial and transmedial flake terminations. Flake scar orientations are mainly perpindicular to the point axis, except for the basal thinning flakes, which are parallel with it" (Bradley and Frison 1996:43). The same thing could be said about the points from the Plainview site based on published illustrations, although Krieger places greater emphasis on irregular and comedial flaking in his textual description of the Plainview sample (1947:942).

Interestingly, both the 14WCTEMP-134 and Rintoul-01 points exhibit broad, serial transmedial flaking on one side, and irregular flaking on the other. However, on the Rintoul-01 specimen the flaking pattern is slightly oblique and occurs just above the extent of stem grinding: an indication that it was resharpened using transmedial flaking and beveled while hafted. On 14WCTEMP-134 the flaking pattern is perpendicular and present on the stem itself. Goshen points from the Mill Iron site exhibit remnants of perpendicular stem flaking left over from the preform stage, and evidence of resharpening while in the haft is common. In contrast, on Dalton points from the Sloan site (Morse 1997), serial stem flaking is largely obliterated by extensive basal thinning / fluting / shaping that occur throughout the manufacturing and rejuvenation process. These observations, combined with the tip resharpening evident above the extent of lateral grinding on both the 14WCTEMP-134 and several Mill Iron specimens (Bradley and Frison 1996), suggest that Goshen-Plainview points were fixed in their hafts until broken or exhausted while Dalton points could be removed for maintenance. The presence of unbeveled, basally ground, concave-based lanceolate points at the Sloan Site (Morse 1997:21), some of which do visually resemble Plainview-Goshen points, suggest the existence of some variability in Dalton haft technology. If so, clear differences should be evident between types in attributes like basal concavity depth and base width, and within type clusters if a dual hafting methods were in use. An investigation of the hypothesis that metric stem attributes can be used to differentiate samples of Goshen-Plainview from look-alike Dalton points is a focus of the analytical section of this paper.

To briefly summarize, extant Dalton / Goshen / Plainview type definitions don't really work very well for differentiating between these two isolate specimens, but careful evaluation of descriptive data suggests a possible typological distinction based on stem flake patterning and stem attribute data that merits additional investigation. The recent reassignment of the Zone 88 assemblage from the Red Smoke site (25FT42), "perhaps the best known and documented Plainview assemblage in the Central Plains region" (Hofman 1996:65), to the Dalton Complex (Knudson 2002) raises serious questions about the validity of distinctions between the Goshen, Plainview and Dalton types

in the Central Plains in general, and further reinforces the need to investigate attribute-level variability within and between these types.

Analysis of Intra- and Inter-Type Variation in Projectile Point Stem Attributes

The development of replicable classification criteria for dealing with variability in lanceolate projectile points is a prerequisite to studies aimed at documenting their spatial distribution and temporal range. Exploratory data analysis (EDA) encompasses a suite of pattern recognition techniques that emphasize the visual display of data rather than summary statistics. The use of EDA is advantageous in this context because it bypasses the statistical assumption of normality (Daniel 1998:49), an assumption certainly not warranted whenever inter-observer variability is itself a probable source of both intra- and inter-type variation.

In this study, a scatterplot comparison (Figure 3) of basal width and basal concavity depth in key reference specimens is used to test the hypothesis that stem attributes cluster according to type-specific variation in hafting methods. If the data sets from all three types overlap, then my hypothesis that hafting technology produces distinctive stem configurations with typological significance should be rejected. If type clusters appear to isolate Goshen-Plainview points from Dalton points, then the hypothesis fails to be rejected, and the reference data sets can be used as a baseline against which to evaluate the tentative type assignments for the specimens documented in this article.

These expectations are complicated by the fact that a prominent Texas typology reference advocates dividing concave-based lanceolate points into greater than 4 mm (Golondrina), and less than 4 mm (Plainview) categories (Turner and Hester 1999), and that this distinction is clearly being used to justify type assignments (e.g., Hatfield 2001). Golondrina points have been shown to be statistically distinct from Plainview points (Hatfield 2001:58), which are also older, but they've remained associated in the literature for lack of suitable comparanda from their 9030-8780 B.P. temporal range (Hatfield 2001:58). Until the publication of the extremely late date of 8,495±45 years B.P. on purified bison bone collage from the single component Dalton-age Laird site in Sherman County, Kansas (Blackmar 2002), comparisons between Golondrina and Dalton seemed unwarranted. However, the flared basal ears and heavily ground basal concavities characteristic of Golondrina points rather unambiguously identify them as early stage Dalton variants. In particular, Golondrina points overlap morphologically with a small sample of unbeveled, unserrated, and basally ground specimens present in the Sloan Site sample (Morse 1997:21). Therefore, in an effort to reduce the risk of reasoning errors, a sample of Golondrina points from the Triple S Ranch locality, a multi-component Paleoindian-Late Prehistoric site in Texas, are also included in Figure 3. If my interpretation about the typological affiliation of Golondrina is correct, then the Goshen-Plainview and Golondrina-Dalton data sets should cluster accordingly.

Metric stem attributes for the 51 artifacts included in Figure 3 are listed in Table 1. The selected stem attributes include MW= Maximum Width; BW=Basal Width; and BCD=Basal Concavity Depth. Artifacts that function in this analysis as key reference specimens for their respective types include 7 points from Plainview and 12 from Ryan's site for the Plainview type (Krieger 1947; Hartwell 1995); 16 points from the Mill Iron site for Goshen (Bradley and Frison 1996); and 16 points from the Sloan site for Dalton (Morse 1997). All artifacts with complete measurements for the selected stem attributes were included in the analysis except for the

Dalton sample, which was deliberately constructed to isolate the Goshen Plainview-like variability from the unambiguous Dalton forms present in the Sloan assemblage. The sample includes artifacts described as large points, unbeveled points, or preforms, and all bear some morphological resemblance to Goshen-Plainview types based on artifact illustrations and/or written descriptions (Morse 1997). Basal width was not recorded for the Mill Iron Goshen projectile point assemblage (Bradley and Frison 1996), so I substituted specimen width. Finally, attribute data on the Plainview site specimens were only recorded to the nearest mm (Krieger 1947).

Figure 3 illustrates cluster patterning along Goshen-Plainview and Golondrina-Dalton type lines, so the hypothesis that stem attributes pattern according to type-specific variation in hafting methods cannot be rejected. Goshen specimens appear to be, on average, wider than Plainview specimens, but I believe this to be a fallacy produced by the unavoidable use of maximum width rather than actual base width to characterize the Mill Iron Goshen sample. The single Golondrina artifact that overlaps with the Goshen-Plainview cluster falls so clearly outside the >4mm type definition referenced in Hatfield's (2001:58) discussion of the type that is best explained as a data recording error. This preliminary effort suggests intensive research on stem attributes of concave-based lanceolate projectile points is justified since it could lead to robust metric criteria for distinguishing Goshen-Plainview from Golondrina-Dalton look-alikes.

The next stage in the analysis is to insert the attribute data for the two artifacts described in this paper. To make things more interesting, Figure 4 is a scatterplot comparison of the same stem attributes presented in Figure 3, but expanded to include 69 additional specimens from multi-component localities in Kansas, Missouri, and Texas for a grand total of 121 data points. The supplemental sample includes five early stage Dalton points and one Goshen-Plainview point found in surface contexts at the multi-component Big Eddy locality in Cedar County, Missouri (Ray 2000). There are many other projectile points from Big Eddy that I would have added to this study, but base width and basal concavity depth are not artifact attributes included in the chipped stone tool data appendices included in the two published site reports for this site (Lopinot, Ray, and Conner 1998, 2000). Ten Golondrina and 25 Plainview points appear courtesy of Ginny Hatfield's M.A. thesis on the Paleoindian to Archaic surface assemblage from the Triple S Ranch Locality in Hamilton County, Texas (Hatfield 2001). Finally, 25 initial-early stage Dalton and 2 Plainview points were included from Bert Wetherill's M.A. thesis on the Bonner Springs Locality (Wetherill 1995). To facilitate examination of data in Figure 4, all Plainview specimens were assigned square patterns, Goshen circles, Dalton triangles, and the Golondrina sample is marked by diamonds. The two specimens from this study are large green squares with x and + motifs. The reference sample data points are twice as large as the supplemental data points and are also distinguished by a white border.

Several interesting trends are apparent in Figure 4. First, the Dalton-Plainview identity crisis causing so much consternation at Medicine Creek (Bamforth 2002; Knudson 2002) is clearly also a problem well outside that valley. The majority of the points present in the gray area in between the reference sample core clusters are Dalton points from the Bonner Springs locality. It's unclear at this time if the inter-cluster data from Kansas reflects real variability in Dalton Complex hafting strategies, perhaps specialized for bison hunting in the Central Plains, or simply indicates a certain amount of classification error. The fact that one each of two Plainview points

recorded from Bonner Springs Locality fall solidly within opposite clusters suggests that latter scenario is a factor at work in this particular context. Luckily, the Bonner Springs Locality sample is sufficiently well-described (Wetherill 1995) so that the type assignments for each specimen can be reevaluated at a later date. Several Plainview points included in this analysis clearly have basal concavity depths well outside the range of the <4mm type definition for Plainview (Turner and Hester 1999), and by definition probably should have been coded as Golondrina, if not Dalton.

Reanalysis of the problematic artifacts shown here might produce a cleaner scatterplot, or they might not. However, that really falls outside the scope of this particular exercise. My intention in pointing out the disparities in the data illustrated in Figure 4 is to set off alarm bells about the use of type count data derived from multiple sources in Paleoindian distribution studies. Type counts are human decisions, inherently prone to error and subject to both random and systematic biases. If they are used, adequate artifact documentation is needed to ensure that the type labels and conclusions based on them can be independently verified. Even then, *caveat emptor*. We've got a lot of artifacts to document before we can get a handle on the differences between Dalton Complex technology on the Plains as opposed to the Eastern Woodlands.

After this brief foray into the Dalton-Goshen-Plainview vortex, I can certainly empathize with what Bert Wetherill must have experienced while collecting the Bonner Springs Locality data for his M.A. thesis. As for my untyped specimens, the 14WCTEMP-134 specimen falls solidly within its original Goshen type designation, and the material type lends additional support for the Northern Plains label. In contrast, the Rintoul-01 specimen falls on edge of the Goshen-Plainview cluster where it is surrounded by artifacts classified as both Dalton and Goshen-Plainview points. The Rintoul-01 point was definitely hafted during resharpening / edge beveling, but I'm not quite sure how to interpret the hafting information at this point in time. To the best of my knowledge, the existence of a fixed / removable hafting dichotomy within the Dalton multi-stage type is merely a plausible fiction at this moment in time, but it may be a factor influencing the scatter between the dominant clusters and therefore merits further consideration. I'm not at all confident yet about stem flaking or flaking patterns in general being legitimate diagnostic criterion for either Goshen-Plainview or Golondrina-Dalton, but I'm willing to argue that they deserve further study. The serration and edge beveling should technically clinch the type assignment: it's a Dalton according to the Bradley (1997:57) paradigm. Still, I'd like to see some comparative presence / absence attribute data for a large Goshen-Plainview sample other than Mill Iron. Hatfield coded five Plainview points at the Triple S Ranch site as having blade beveling, while 13 additional artifacts were coded as indeterminate (2001:224). To me, her sample seems to negate Bradley's observations entirely.

I prefer leaving Rintoul-01 as unidentified at this time rather than see it used / abused in Paleoindian distribution studies. Admissions of defeat, or temporary retreat, with respect to type assignments are an honorable way out of a scholarly impasse. In such cases, the recorder bears the burden of making sure the artifact doesn't fall through the cracks forever by leaving behind adequate documentation of its existence and unique characteristics.

Conclusion

Like the Medicine Creek valley, the geographic position of Kansas qualifies it as an ecotone where a tremendous range of variability

in Paleoindian types is to be expected. Private collections are the repositories in which that variation lies: they have, and will, continue to provide tremendous amounts of data useful for framing the Paleoindian occupation of Kansas. Consequently, misidentifications made in the context of Kansas distributional studies have the potential to impact Paleoindian research throughout the Great Plains, as well as skew our perceptions about what happened in our own backyard. Selective use of EDA methods can potentially enhance the accuracy, precision, and replicability of type identifications, thereby facilitating the eventual integration of more "problematic" types into Paleoindian land-use research.

That said, EDA methods are also really convenient for summarizing large attribute data sets while simultaneously preserving the variability within them (Daniel 1998). This is a major boon for proponents of a comparative research paradigm founded on the abandonment of type labels in favor of copious descriptive content and a healthy aptitude for negative capability (e.g., Knudson 2002:137)[3], and for the study of variation within, between, and in lieu of type constructs in general.

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[3] Negative capability implies an innate ability "to see things that are hopeless and yet be determined to make them otherwise" (Jones and Wilson 1987:245).

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