Defining Central Plains Agriculture: The Arrival of the Common Bean (Phaseolus vulgaris)

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Over the past 20 years, archaeobotanical research in eastern North America has focused on identifying the earliest cultivated plants and defining the relationship between these plants and the people who selected them. In the midwest riverine region, attention has been directed towards indigenous species, especially goosefoot (*Chenopodium berlandieri* ssp. *jonesianum*.) marshelder (*Iva annua*), sunflower (*Helianthus annuus*), and wild squashes/gourds (*Cucurbita pepo* ssp. *ovifera*), which begin to exhibit morphological characteristics of domestication in the mid-Holocene period (Gremillion 1994; Smith 1992). The fleshy tropical cultigen, *Cucurbita pepo* ssp. *pepo*, was introduced into the region by the Late Archaic period. By approximately AD 200, maize, another tropical species, was introduced into the region but remained a minor dietary importance for several centuries. Other native species also became domesticated, including little barley (*Hordeum pusillum*), erect knotweed (*Polygonum erectum*), and maygrass (*Phalaris caroliniana*). By the Late Woodland period, maize consumption increased, such that by the following Mississippian period, it is interpreted as one of the primary crops of an agricultural economy. The common bean (*Phaseolus vulgaris*), yet another tropical domesticate introduced into North America, appears as part of this economy.

This research has been used as a model to help explain the dynamics of Central Plains agricultural origins (Adair 1988, 1996, 2001), especially for the eastern portion of the region. Models, however, do not require identical developments or sequences. This is particularly true for the Central Plains, where archaeobotanical assemblages do not include all of the domesticates recovered from eastern contexts, nor are the domesticates identical in successive cultural contexts (Adair 2001). Yet the adaptive strategies of mid-Holocene populations in both areas appear to have been a response to similar climatic patterns that may have initiated early horticultural practices. There is also good evidence, in the form of AMS dates on recovered cultigens, to document that indigenous species were unequivocally domesticated in both regions prior to the arrival of any of the tropical cultigens. In the eastern portion of the Central Plains, primarily along the Missouri River trench, analyses of archaeobotanical data from Late Archaic assemblages have yielded remains of the thin-shelled cucurbit (Adair 1998, 2001) while domesticated

marshelder has been directly dated to an Early Woodland context. Some of the differences between the two regions, while apparent, may be partially attributed to sampling biases. For example, small amounts of maize are associated with Plains Middle Woodland deposits but direct dates on some of these remains reveals their association with later occupations. In addition, chenopodium and sunflower seeds recovered from Plains Archaic sites do not exhibit morphological evidence of early cultivation, despite the fact that the former often dominates the archaeobotanical assemblage. Perhaps an even greater factor is the scarcity of sizeable assemblages from pre-Woodland contexts.

While the economic or dietary importance of native weedy annuals has received considerable research attention and is now seldom questioned as a critical component in agricultural developments, the presence and importance of maize still receives significant attention. Perhaps this is due to the fact that for many decades maize was viewed as the prime mover in the development and spread of Hopewellian culture and population growth. Maize also becomes the primary agricultural crop during the late prehistoric period throughout much of North America while its planting, growing, and harvesting cycles became entrenched in many Native American rituals and beliefs. The three introduced domesticated crops were, for many years, believed to have spread north from Mexico or Mesoamerica either as a group or individually as rapid waves over very short time intervals. The corn, beans, squash triad was often equated with historic period Native farming, giving some validity to its presence as an agricultural group prior to contact.

The common bean is clearly the last of the tropical cultigens to enter the eastern portion of North America, and thus, the presence of the species in an agricultural economy has not raised any serious questions. On several occasions however, examinations of older curated collections have documented the misidentification of this species. Morphological characteristics of the native wild bean (*Strophostyles helvola*) and the common domesticated bean are nearly identical, except for size. Wild beans are significantly smaller, measuring less than 3.5 mm in length. Lengths of domesticated beans recovered from several Nebraska, Glenwood, and Steed-Kisker phase sites range from 7.4 to 11.2 mm (Adair 1988, unpublished notes) (Figure 1), a size that cannot be confused with the wild variety. Other researchers have explained the scarcity of the domesticated bean in archaeological deposits as an indication of its lower economic value. Still others extol its nutritional value, especially as a dietary compliment to maize. The common bean is the last of the introduced species to appear and is almost always associated with the Mississippian or Village period in the east and in the Plains. However, its

exact arrival time and route may, in several ways, be one of the more significant agricultural or adaptive differences between the eastern margins of the Plains and the riverine midwest.

Figure 1. Beans – 25SY31

Recent AMS dates from several Steed-Kisker and Nebraska phase sites confirm an association of this crop with these cultural complexes (Table 1). Of particular interest is the fact that the ranges of the dates from several samples are centuries earlier than expected. This expectation is based in part on the recent AMS dating of the common bean from northern Eastern Woodland site contexts (Hart et al 2000), which suggests that the domesticate was first grown in this region during the 13th century. Further south in the American Bottom region, no domesticated beans were present in the Cahokia ICT-II (Interpretative Center Tract II) samples, nor have any been identified for any pre-Oneota sites investigated during the FAI-270 project (Johannessen 1984; Lopinot 1994). The absence of this domesticate in the American Bottom area has been interpreted to reflect its unimportance in the economy of Mississippian people (Lopinot 1994:139). This is clearly not the case in the eastern Central Plains. While bean remains do not dominate the assemblage, they are consistently represented within and between sites.

Table 1. AMS dates on the common bean (*Phaseolus vulgaris*)

Site	Provenience	Lab #	Age BP	2 sigma cal
25BO23	Fea 9301	AA41430	661+/-42	AD 1290-1415
25SY31	Fea 8407	AA36108	810+/-45	AD 1159-1285
25SY31	Fea 8411	AA36109	780+/-40	AD 1190-1292
25SY31	Fea 8411	AA36110	825+/-45	AD 1065-1282
23PL16	Feature 1	AA41431	656+/-68	AD 1258-1418
23PL16	House 1 hearth	AA41432	858+/-39	AD 1040-1264
23CL115	Feature 3	AA41433	804+/-42	AD 1161-1285
23CL109	Feature 5	AA41434	842+/-38	AD 1060-1277

The AMS dates raise two important questions. First, given the earlier than expected ranges from several of the Steed-Kisker dates, does this help bolster the recent suggestions for an earlier beginning of the Steed-Kisker complex? (see Logan 1988; Logan and Ritterbush 1994; Roper 1995). Eliminating the radiocarbon dates processed at the Gakushuin laboratories, considered unreliable, there are at least 25 conventional radiocarbon assays from Steed-Kisker sites (Logan 1996). The calibrated ranges for ten of these dates fall before AD 1100 (Roper 1995), with some falling within the 8th and 9th centuries. Do all of the available and acceptable dates suggest a continuous occupational sequence from the early 11th to the late 13th centuries, such as was the conclusion reached after investigations at several Mississippian sites in the American Bottom? The answer to this certainly awaits greater research, although there can be no argument that the AMS dates on an annually grown crop plant reflects human activity by the sites' occupants.

The second question takes into account the radiocarbon dates but focuses on the route by which the common bean entered the Central Plains. How did this species get to the Central Plains at this time? This is admittedly a difficult question to answer. Given the similarities in agricultural developments between the eastern Woodlands and the Central Plains, and the similarities in ceramic styles between Middle Mississippian groups in the two areas, there is a logical expectation for the eastern Woodlands to be the source of the common bean. As noted above however, this cultigen, has not been recovered to date from temporally equivalent eastern sites. The common bean is also not found in early village contexts in the Southern Plains (Drass 1995) or southeast Missouri (Lopinot 1999) or in late prehistoric sites in the northeastern New Mexico/southwestern Colorado region (Cassells 1997). Beans are however, identified in Late Archaic contexts in the Southwest (Wills 1995), but the route by which they could have traveled westward is anything but clear. If the common bean traveled through the southern Plains or the western region of the Central Plains before being grown by Steed-Kisker farmers, it should be present in the archaeobotanical assemblages of sites dating prior to the 11th century. Instead, flotation samples from the Late Woodland Two Deer site (14BU55) and the Bluff Creek phase Hallman site (14HP524), two sites which exhibit good evidence of farming, did not yield remains of the domesticated bean. In fact, AMS dates on three cultigens recovered from the Two Deer site indicate that the occupation of this site may have overlapped that of several Steed-Kisker sites by about 100 years.

It is beyond the scope of this paper to analyze the potential answers to the questions in greater detail. The summation points that should be

made at this time, however, are twofold. First, our understanding of the details involved in the development of farming simply cannot be enhanced without the aid of analytical techniques such as AMS radiocarbon dating of annual crop plants. Such dates eliminate the "old wood" problem that has plagued the less-than-abundant treed Plains region for years, and although AMS dates are still subject to the same calibration curves as all radiocarbon dates, they are dating the time span when a specific plant was grown. With a more refined temporal and spatial distribution of each crop that was grown by early Plains farmers, we are in a far better position to reconstruct how and when Central Plains farming developed, rather than evaluating how the Plains data fit models developed for the Midwest riverine region, or the greater Southwest. The Central Plains is not a region of agricultural origins on the scale defined for the adjacent areas; however, the beginnings of Plains agriculture must be approached with data specific to the region and evaluated within regional adaptive patterns.

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Temper in White Rock Site Ceramics

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One of the defining attributes of Oneota ceramics traditionally has been shell temper. Although an increasing number of studies has noted the presence of other types of temper, the majority of ceramics from Oneota sites throughout the Midwest is tempered with shell. This is not the case for ceramics from White Rock phase sites in north-central Kansas and southern Nebraska (Marshall 1969; Neuman 1963; Rusco 1960). The apparent lack of shell temper in sherds from these sites has until recently hindered the clear identification of these sites with the Oneota tradition. Analyses of samples of ceramics recovered from the White Rock site in the 1990s have revealed a much higher percentage of shell temper than was previously reported (Logan 1998; Logan and Banks 1994; Wininger and Logan 1995). This has raised questions regarding the actual composition of ceramic pastes used by White Rock peoples, identification of temper, and how past peoples selected tempering agents.

One objective of my on-going study of White Rock phase assemblages is to identify similarities and differences between White Rock phase ceramics and those of other Western Oneota manifestations. My hope is that these comparisons will lead to possible interpretations regarding relationships between these populations and modes of adaptation for Oneota populations in the Central

Plains. Part of this research involves reanalysis of ceramic paste composition. Preliminary data from a portion of this study are presented and discussed herein.

Background

The earliest study of ceramics from White Rock phase sites in north-central Kansas and southern Nebraska resulted in the definition of the Walnut Decorated Lip (rim) type (Rusco 1960). Ceramics included in that initial study were collected from the Green Plum site (25HN39) in 1946 and 1950, Blue Stone site (25HN45) in 1948 and 1952, Glen Elder site (14ML1) in 1937, and White Rock site (14JW1) in 1935 and 1937. The majority of sherds from these sites was classified as Walnut Decorated Lip type (Rusco 1960). The tempering agent of this type was defined as "moderate amounts of medium to coarse grained sand" (Rusco 1960:30). A small number of sherds from these sites did not appear to have all the attributes of the Walnut Decorated Lip and were described as various "miscellaneous" sherds. In some cases, these were tempered with something other than sand. For instance, seven body sherds from Green Plum and two from Blue Stone included "a white non-calcareous mineral"(Rusco 1960:34). The temper for one shoulder sherd from Blue Stone, 20 body sherds from White Rock, and 37 body sherds from Glen Elder was identified as shell (Rusco 1960:34,65). The brief descriptions of these sherds do not indicate that they vary dramatically from other "typical" White Rock phase (Walnut Decorated Lip) ceramics.

Two other studies of White Rock phase ceramics employed the classification system developed by Rusco (1960) and identified most analyzed sherds as Walnut Decorated Lip. Again, sand was listed as the dominant tempering agent. However, both Neuman (1963) and Marshall (1969) identified shell in the paste of several of the analyzed sherds. Neuman (1963:266, 272, 282) included among these one rim and three body sherds from the White Rock site, two rim and nine body sherds from the Intermill site (14JW202), and nine body sherds from the Warne site (14JW2). A larger number of sherds, including 15 rims, 133 body sherds, and four appendages, from the Warne site were classified as a separate group of shell-tempered ceramics (rather than as miscellaneous sherds) (Neuman 1963:281). Other than eight of the miscellaneous body sherds from Warne that have a cord-roughened surface treatment, these shell-tempered ceramics share many of the attributes of the Walnut Decorated Lip type. Noting the similarity of many of the shell-tempered sherds recovered from the Glen Elder site in 1937 and 1963 to the predominant sand-tempered Walnut Decorated Lip sherds, Marshall (1969:39) included three rims, 15 body sherds, and two appendages that were tempered with shell in the sample of Walnut Decorated Lip sherds from that site. Another sample of shell-tempered ceramics that includes five rims, 13

body sherds, and one handle were classified as an unnamed type different from Walnut Decorated Lip (Marshall 1969:38, 49-50). It is not clear from the written description of this second class of ceramics what the primary differences between it and Walnut Decorated Lip are, although lack of shoulder decoration and minor differences in handle width, sherd thickness, paste texture and color may have been defining attributes. The figure caption accompanying an illustration of one of the rim and handle sections for this latter type notes that it "resembles Fanning Plain ware," another Western Oneota ceramic type (Marshall 1969:Plate 16b, 123; Wedel 1959:145-148).

These early studies of White Rock phase ceramics indicate that the majority of sherds from White Rock sites share many similar attributes, including sand as the primary temper type. Although shell tempering has been noted in these assemblages, the frequency of sherds with this aplastic material is small, ranging from 0 to 6.4% (Logan 1998:261; Wininger and Logan 1995:64). In comparison with other Oneota assemblages, White Rock ceramics are very similar, especially in terms of rim form and decoration. However, the low incidence of shell tempering is one distinguishing attribute of White Rock ceramics.

Reanalysis of White Rock temper

A renewed interest in White Rock phase sites developed over the past decade. Between 1991 and 1995 Brad Logan of the University of Kansas Museum of Anthropology (KUMA) conducted field studies at Lovewell Reservoir with special emphasis on the White Rock and Warne sites. His analyses of materials recovered during those investigations and review of earlier findings led to definition of the White Rock phase as a western manifestation of the Oneota tradition (Logan 1995, 1998). Don Blakeslee of Wichita State University has also been involved with White Rock research through his reanalysis of materials from the Glen Elder site (Blakeslee, et al. 2001).

One of the noteworthy findings of Logan's analyses of ceramics recovered from the White Rock site in 1993, 1994, and 1995 is a dramatically higher frequency of shell tempering (51.1%) than was previously identified for White Rock phase sites (Logan 1998; Logan and Banks 1994; Wininger and Logan 1995:261). This observation led to a call for reanalysis of White Rock phase ceramics to determine if shell temper had been misidentified and to reconsider whether temper is a meaningful attribute in "cultural" identification (i.e., as a defining attribute of Oneota ceramics) (Logan 1998:261). This preliminary report addresses the first of these two issues. A future report will present results from a broader study of White Rock ceramics that will address both issues.

In an attempt to determine if shell temper has been misidentified in previous studies of White Rock ceramics, I reanalyzed sherds recovered from the White Rock site in 1935 and 1937. The assemblages from these field projects were combined and originally curated by the Nebraska State Historical Society before being transferred in 1987 to the Kansas State Historical Society. Rusco (1960:63-65) analyzed the 2,242 sherds in this original assemblage. The reanalysis described herein included 2,126 of those sherds in addition to ten others held by the University of Michigan Museum of Anthropology (transferred there in 1939). Sherds with illegible or missing catalog numbers were not included in the reanalysis. (The condition of many of the curated ceramics suggests that they may have suffered water or other damage since their original recovery.)

Identification of aplastic inclusions in the paste was difficult due to a variety of factors, including size of the inclusions, deterioration of the sherds, and others. It became necessary to inspect each sherd under low-power (10x) magnification. Sherd edges (commonly weathered), as well as the exterior and interior surfaces were inspected for inclusions or other signs of the use of tempering agents.

Some materials noted within the paste may represent natural inclusions rather than cultural additives. For instance, small reddish brown to nearly black non-siliceous particles were visible in more than one-third (34%) of the sherds. These are believed to be particles of hematite and were likely incorporated naturally into the ceramic paste. Hematite was found in varying quantities alone and in combination with other inclusions.

Sand is another material that may have been incorporated into the ceramic paste as a natural inclusion. It appears to have been assumed in previous analyses of White Rock phase ceramics that its presence indicated the purposeful action of a ceramicist adding sand to the paste as a tempering agent. This seems to be a plausible assumption for the sherds that contain relatively coarse sand grains or relatively dense concentrations of fine sand. A wide range of variation exists in the relative size and concentration of sand grains in the White Rock site sherds. It is possible that sand, especially very fine-grained sand, may occur naturally in local clays used for ceramic production. Due to my inability to distinguish between sand as a tempering agent and as a natural inclusion, its presence was noted as possible temper whenever two or more individual grains were identified under low magnification. (Single grains were noted, but were not counted as temper due to the good possibility that they were natural inclusions or were incorporated accidentally in the paste during ceramic production.) All stone particles were classified as sand since they were generally rounded and exhibited little angularity.

The presence of shell particles in ceramic pastes is assumed to represent temper rather than natural inclusions. It is assumed here that when Rusco, Neuman, and Marshall identified shell as a tempering agent of White Rock ceramics that they saw white platy calcareous inclusions in the paste. I identified shell particles like these in 34 (1.6%) sherds. In all cases the shell particles were sparsely distributed and quite small (unlike what this researcher has commonly noted in other Oneota assemblages, such as the Leary site assemblage). These characteristics (combined with the consistent use of magnification) may explain the discrepancy between my observation of 34 sherds and the 20 shell-tempered sherds noted by Rusco (1960:65). Despite this infrequent observation of shell in the White Rock ceramics, shell is believed to have been a much more prevalent form of temper than this statistic reveals.

It was noted, especially under magnification, that many of the White Rock sherds had platy voids in the paste. Like actual shell particles, these voids were small and commonly sparsely distributed. In several instances shell remained in part of these voids confirming that they were produced by the decomposition of finely ground shell. Brad Logan (and former KU student Derek Wininger), who identified the temper in the White Rock site ceramics held by KUMA, classified sherds with platy voids as shell tempered (Logan, personal communication). This explains the higher than expected frequency of shell temper found by Logan and Wininger. It is suggested here that the low frequency of shell temper found during earlier White Rock ceramic analyses is due to the lack of observation or identification of shell voids in those ceramics.

Many different combinations of aplastic inclusions were identified in the paste of the White Rock site ceramics. These range from no visible or clearly identifiable inclusions, fine sand sparsely or densely concentrated, coarse sand particles, sparse shell particles, sand and shell, shell voids, sand and shell voids, and, possibly, bone. These are summarized as five classes of aplastics (Table 1). The classification of 'shell' includes sherds that contain shell, shell voids, or a combination of the two without any visible sand particles. The class of 'sand' was reserved for sherds with more than one visible sand grain and no evidence of shell inclusions. The sand particles ranged from fine to coarse and from sparsely to densely distributed in the paste. (In some instances sand particles protruding on the surface of the sherd gave it a granular or "gritty" texture; however, this was not true of all sherds including sand particles. A similar texture is also produced in some cases by hematite, rather than sand, particles.) It was not unusual to find both sand and shell or shell voids in the same sherd; thus, these were classified in a combined class of 'sand and shell' although the relative

concentration of each was not measured. A class of possible 'bone' temper is noted here. These sherds included small white particles that were non-calcareous and not platy in appearance. Finally, it was impossible to clearly identify aplastic inclusions in a number of the White Rock site sherds. Many of theses 'indeterminate' sherds have a clean, very fine paste that appeared to have no added inclusions (although its sparkling appearance under intense light and low magnification suggested that very fine silica particles may be present). In a few instances a single sand grain, single shell void, or few non-platy voids may be visible under magnification. These were considered too few or of questionable origin to classify as possible sand or shell temper. The presence of hematite in the White Rock site sherds is not recorded in Table 1. As noted earlier, hematite is considered here to be a natural inclusion in the paste and was found in combination with sand, shell, and bone.

Table 1. General classes of aplastic inclusions in sherds recovered from the White Rock site in 1935 and 1937

Temper Type	Number (#)	Percentage (%)
Shell	630	29.5
Sand	1,179	55.2
Sand and Shell	126	5.9
Bone	3	0.1
Indeterminate	198	9.3
Total	2,136	100.0

Summary

Reanalysis of aplastic inclusions in sherds recovered during 1935 and 1937 from the White Rock site (14JW1) indicates that in addition to sand, shell was used alone or in combination with sand (or natural sand inclusions) as a tempering agent for White Rock ceramics. More than one-third (35.4%) of this sample of White Rock ceramics contained shell additives. This is a much higher frequency than originally identified by Rusco (1960) for the same assemblage. The discrepancy between these observations is likely due to the method of data collection and present knowledge that shell temper may be visible as platy voids rather than as actual pieces of crushed shell. The observations made here are more like those made by Logan and Wininger for a more recently obtained sample of ceramics from this site (Logan 1998, Logan and Banks 1994, Wininger and Logan 1995). They too found shell more prevalent in the White Rock site ceramics than previously reported, although at an even higher frequency (51.1%) than identified here. A more complete study of the entire assemblage of White Rock site

ceramics (combination of collections recovered in 1935, 1937, 1956, 1993, 1994, 1995) is presently underway. A careful search for shell and shell voids in ceramics from other White Rock phase sites is needed for comparative purposes.

Interpretation of the significance of sand and shell tempering in White Rock sherds will be presented in a future report of on-going analyses of White Rock site ceramics. However, it is noted here, that although shell temper is now known to have been used by White Rock peoples, interpreted as Oneota migrants in the Central Plains, this ceramic attribute remains unlike that commonly found associated with Oneota sites. Shell temper is clearly the predominant temper type for Oneota ceramics found outside the Plains. This temper is not only more common at other Oneota sites but is less difficult to identify, often visible macroscopically as platy shell particles of some size and density. Differences in frequency, form, and density of shell temper between the White Rock and other Oneota site ceramics likely reflect an adaptive response to life in the Plains as bison hunters and farmers. Other ceramic attributes (e.g., rim form and design elements), as well as other archaeological signatures (e.g., form of chipped stone and ground stone artifacts, settlement types and patterns) clearly identify White Rock phase remains as Oneota. This identification remains despite variation in the attribute of temper type and form.

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Excavation of the Scott Site (14LV1082) A Steed-Kisker Phase House in Stranger Creek Valley

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In June 2001 heavy rains in the upper part of its watershed sent a torrent of water down Stranger Creek, a north-bank tributary of the lower Kansas River that drains parts of Atchison and Leavenworth counties. The flood revealed a concentration of pottery, some lithic artifacts, and burned timbers to Scott DeMaranville, a local collector who contacted the author in mid-June. I visited the site with DeMaranville on June 26 and again on the 28th in the company of archaeologists from the Kansas State Historical Society. The obvious significance of the site, a single house of the Steed-Kisker phase, and its vulnerability to any future plowing led to a collaborative salvage excavation that enlisted help from several institutions from July 16 to August 1.

The flooding that revealed the Scott site (14LV1082) warrants some discussion as it was only a more dramatic example of periodic inundations of Stranger Creek valley. As I noted in my doctoral dissertation, Stranger Creek averages three flood episodes annually and, assuming this process has characterized the stream throughout the Late Holocene, it was suggested to have removed some sites and buried others in the major valley

(Logan 1985, 1988a). The flood that occurred this past June was described by one local as "a wall of water" that surpassed the intensity of the Great Flood of 1993. Following a six inch overnight rainfall, Stranger Creek overtopped its banks at its confluence with Little Stranger Creek and, instead of following a series of southward draining sloughs that generally drain floodwaters, the combined force of both streams stripped the plowzone from the corner of an extensive field of corn between two previously recorded sites, 14LV1043 and 14LV1079. Ironically, the field had been surveyed by the author in 1979-1980 as part of the Stranger Creek basin survey, at which time no cultural material was seen (Logan 1981). Still, the presence of a buried component there was not surprising. After flooding of part of that area in 1982, another local collector had discovered a Late Prehistoric site (14LV1043; Logan 1983) a few hundred meters north of the Scott site. Erosion along a chute, or trench created by overbank flows across a meander, about 250m south of the Scott site resulted in the discovery of the Evans site (14LV1079), a multicomponent occupation that I recorded in 1999. At that site, a buried Archaic component(s) is exposed at a depth of about one meter, attesting to the long history of occupation along this reach of Stranger Creek. The alluvial contexts of 14LV1043, 14LV1079, and 14LV1082 reveal contrasting aspects of the stream's dynamic nature: 1) valley aggradation through periodic overbank flows that buries prehistoric sites, and 2) lateral planation and horizontal scouring that subsequently exposes and erodes them (cf. Logan 1985:281-285, 305-307).

DeMaranville's investigation included surface collection and the excavation of a shallow (ca. 10cm), irregularly shaped pit over an area of ca. 1.5m square. The pit yielded several sherds, including some impressively large, vessel fragments, suggesting the site contained a high density of ceramics. This was also evident in his surface collection of more than 100 sherds from a ca. 100m square area around the pit. Nearly all of the pottery is Platte Valley ware, which is diagnostic of the Steed-Kisker phase (Calabrese 1969; Chapman 1980; O'Brien 1978; Shippee 1972; Wedel 1943). Represented are examples of both Platte Valley Plain and Steed-Kisker Incised jars, a "seed bowl", and the rim of an obliquely incised "water bottle" with a horizontally oriented loop handle (another portion of the same vessel was recovered from the block excavation). Rims of two other vessels from the pit are examples of Nebraska phase pottery. Other sites in Stranger Creek basin have comparable associations of Steed-Kisker and Nebraska pottery, and of Steed-Kisker and Pomona variant ceramics. I have suggested that these are evidence that the watershed was the shared frontier of interacting groups centered to the east (Steed-Kisker), west (Pomona), and north (Nebraska) (Logan 1988, 1990).

Our excavation of a 32 square meter block of 1x1m units revealed an estimated 60% of the house floor. The two weeks allotted for the dig and the dimensions of the quonset-style tent that sheltered excavators and excavation alike dictated the extent of the block. In laying it out we were guided by the exposed, charred timbers and the notable depression that contained them (Steed-Kisker houses were generally of sub-surface construction). Although there were no apparent peripheral postmolds, we were able to delineate the northern and western edges of the structure from the contrast in artifact density in units along those margins of the block. A basin hearth of highly oxidized soil was found in the southeastern quadrant of the block. Since hearths were placed centrally within Steed-Kisker houses, this supports the inference that the excavation encompassed the northwestern quadrant of the lodge, as well as adjacent portions of the other quadrants.

One large cache pit was found in the southwestern corner of the block. Bell-shaped, with a maximum diameter of 95cm and an identical depth below the lodge floor, the pit yielded a rich variety of pottery, a few chipped stone artifacts (e.g., one arrow point) and a few poorly preserved bones (e.g., a bone pin or awl, turtle carapace and plastron fragments, and a deer mandible fragment). The density of pottery in the pit mirrors that of pottery throughout the block. Of the 501 piece-plotted artifacts from the excavation, 361 are sherds and sherd complexes (i.e., concentrations of possibly conjoinable fragments). Lithic artifacts were relatively rare, though at least a half dozen arrow points and a few end scrapers were recovered from the floor. Other items include several small, faceted pieces of hematite indicative of pigment processing (larger examples of these were recovered by DeMaranville from the surface of the house area), a few sandstone abraders, and a small amount of groundstone rubble that includes one possible metate fragment. Bone from the floor was very poorly preserved but includes deer mandible fragments and the scapula of a medium sized mammal.

Interpretation of house architecture will be aided by the location and orientation of several fragments of charred wood that were from 30 to 100cm in length and from 10 to 15cm in diameter. Most were lying on the lodge floor and a few had obviously tapered ends; at least two were vertically oriented with traces of postmolds below them. Their spatial arrangement and eventual species identification promises information about lodge construction and the builders' wood preferences. Charred roof supports have been found at other Steed-Kisker sites, including Cloverdale, Maclarnon, and Gresham in Platte County, Missouri (Shippee 1972), but those from the Scott site appear to be more numerous and their curation at KUMA makes them available for future analyses. Samples

from two beams have been submitted for radiocarbon dating, though the results are not yet available. AMS dating is also planned for some of the burned annual plant remains (nutshells and seeds) that were also recovered.

The fill from the site was waterscreened to enhance total artifact recovery and flotation samples were collected from all features and the southwestern quadrant of each unit. The spatial distribution of daub and burned earth found in varying amounts throughout the block will also aid in reconstructing the nature of the wattle-and-daub structure. For example, Calabrese (1969) noted that the daub in the houses at the Friend and Foe and Butcher sites in Smithville Reservoir, Clay County, Missouri, was more abundant at the center of the structures. We will be able to test the model provided by those sites with the material from the Scott site (cf. Logan and Hill 2000).

At this writing, we plan to return to the Scott site to excavate as much of the remaining portion of the house as circumstances permit. The anticipated long-term analysis of the recovered data will include studies of ceramic variability, household activities, spatial behavior, and "frontier" relations.

I would like to take this opportunity to thank the many persons who selflessly contributed to the excavation of the Scott site. Most of them represent one of the following organizations: Kansas State Historical Society, Kansas State University, Kansas Anthropological Association, Archaeological Association of South Central Kansas, and the Kansas City District, U.S. Army Corps of Engineers:

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An extra dose of thanks goes to the following persons from the KSHS, who set aside other projects to help get the project going, map the site, and move more than their fair share of dirt: Will Banks, Bob Hoard, Martin Stein, and Virginia Wulfkuhle. Dick Keck, KAA president and the only person to attend every day of the dig, has my undying thanks for serving as the field director. Thanks are also due the following persons from the Department of Geography, University of Kansas: Bill Johnson and Rolfe Mandel, who volunteered geomorphological expertise and radiocarbon dating, and Josh Campbell, who collected and processed

GPS data from the site area. I am especially grateful to John Evans, the landowner, and to Henry Caenan, the tenant, for allowing our investigation. Special recognition, of course, goes to Scott DeMaranville for bringing the site to my attention and for donating to KUMA all of the material he recovered from his initial investigation.

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A Pawnee Hunting Camp in the Solomon River Valley

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Documentary evidence for the mid- to late-eighteenth century and the nineteenth century shows that Pawnee hunting territory extended into modern Kansas, encompassing much of the upper Kansas River basin and extending even as far as the Arkansas River valley (Holen 1991; Roper 1992). Pawnee hunting camps, therefore, should be found in Kansas, and they are, although we are only beginning to recognize them. In this brief report, I describe one such site, studied during a routine compliance survey in the valley of the South Fork of the Solomon River. I also solicit information on other such sites.

The Project

During the summer of 2001, the Historic Preservation Office (HPO) requested an archaeological survey prior to expansion of the sewage treatment system for the City of Osborne, Osborne County, in the valley of the South Fork of the Solomon River. The HPO request noted that a previously-recorded site, 14OB6, was in or near the project area. The city retained me to conduct the survey and one of the first things I

did was obtain a copy of the 14OB6 site form. It is minimally detailed but it does list diagnostic artifacts, including a triangular point and "decorated sherds, parallel lines and herringbone." No cultural affiliation is offered. The study area is just upstream from Waconda Lake, and we know that portion of the Solomon River valley contains numerous Middle Ceramic period sites in (Blakeslee 1999) and earlier studies cited therein. Blakeslee (1999:17) indicates that Great Bend aspect hunting camps also are recorded in the Waconda Lake area. The 14OB6 description sounded consistent with neither cultural affiliation, however. Parallel incised lines on the rim are common on vessels from Middle Ceramic period sites, and triangular points may appear, but a herringbone motif on the pottery is unlikely and triangular points really are far more common on Late Ceramic period sites. A point from a Late Ceramic period Great Bend aspect site likely would be triangular, but pottery decorated with either parallel lines or a herringbone motif is unlikely. "Herringbone" decoration on pottery in combination with the triangular point, though, suggested to me that the site might be Pawnee—the parallel incised lines also are consistent with this identification, although not exclusive to it. The site form indicates that the collection is curated at the Museum of Anthropology at the University of Kansas (KUMA), but this project developed very quickly and there was no time to inspect the collection before conducting the survey.

The survey was conducted in early August. The plotted location of 14OB6 is a short distance east of the sewage cell area. Unfortunately, an airport runway, constructed after the site was originally recorded, now crosses the plotted location. Moreover, borrow dirt for runway construction was taken from the area immediately adjacent to the runway and this is the area to be affected by sewage cell construction. The project area was surveyed under excellent conditions (100% surface visibility, adequate rainfall since last disced), but most of the area is now altered and our collection amounted to one flake fragment and an ungulate metapodial that may or may not have been part of the 14OB6 assemblage. We briefly inspected undisturbed ground east of the runway (beyond the project area) on the off-chance that some additional material might extend that far east or that the site might have been plotted slightly inaccurately, but we found nothing there either, in spite of excellent visibility. I concluded that the site has been destroyed (Roper 2001:22) and filed a revised site form indicating this.

Unable to contain my curiosity in light of my previous work with Pawnee hunting camps in Nebraska and my continuing interest in them (Roper 1989, 1991, 1994, 1997), though, I examined the 14OB6 collection at KUMA a few days later. In short, the site is (or was) a Lower Loup/Pawnee hunting camp, now existing only as a museum collection.

In the remainder of this paper I describe the site and the material collected when Don G. Wyckoff recorded it on an unlisted date.

Site Description

Site 14OB6 is in the valley of the South Fork of the Solomon River. It lies at an elevation of 1540 feet amsl at the front edge of a broad terrace on the north side of the river. The terrace edge here is abrupt and well-defined, rising to a terrace tread that stands about 20 feet above the floodplain. The river channel currently is about 200 feet away horizontally and at least 30 feet lower in elevation. The low and gentle valley wall rises above the terrace about 4000 feet to the north. This location adjacent to a main river is entirely characteristic of the Lower Loup/Pawnee hunting camps I have previously studied and know of in Nebraska. A hunting party probably was following a trail along the river when this encampment was made.

The Collection

The museum collection contains 39 potsherds, one projectile point, five biface fragments, segments of two endscrapers, and at least 68 pieces of unmodified lithic debitage, including flakes and shatter. All sherds are small and all are body sherds. Paste is fine and compact, with sparse temper. Surfaces are yellowish-red, with grey firing cores on many sherds. Thicknesses of 33 sherds with both surfaces intact range from 2.7 to 5.4 mm with a mean and median of 4.2 mm. Exterior surfaces are smooth or simple-stamped. Red filming appears on both surfaces of one sherd. Trailed lines appear on some sherds and two sherds have incised decoration. One tiny sherd has the remains of 5 parallel incised lines; another slightly larger sherd has remains of 6 parallel lines diagonally opposing 3 incised lines, suggesting a herringbone or filled chevron motif. These sherds are small, but yet they are diagnostic. Simple-stamping in the Central Plains appears during the fifteenth century. Other characteristics of this pottery, including the characteristics of the ceramic fabric, the sparse temper, trailed lines, and incised decoration that must have come from other than the rim, are consistent with an identification of this material as Lower Loup/ Pawnee (see (Grange 1968) on Lower Loup and Pawnee pottery typology). Mean sherd thickness for the 14OB6 material is the same as that of the body sherds from at least one other known Pawnee hunting camp (Roper 1994:66).

The single projectile point is a complete unnotched triangular specimen. It is 16.0 mm long, 13.5 mm in maximum width, which is at the base, and 2.7 mm in maximum thickness. The basal concavity is 2.5 mm deep. The point was made of white Smoky Hill jasper. Its form, size, and raw material are within the range of points from other Lower Loup/Pawnee sites.

Also present in the collections are two endscraper fragments, each of Smoky Hill jasper. One is very thick,

16.1 mm, and has a squared-off appearance. The other is manufactured on a piece of tabular chert. Endscrapers are abundant on Late Ceramic period sites of several tribes. This particular scraper, however, does not resemble the forms usually found on Great Bend aspect sites, and, as with the pottery, is more nearly consistent with a Lower Loup/Pawnee identification.

The biface fragments are mostly indeed fragmentary and undiagnostic. All are Smoky Hill jasper. Smoky Hill jasper also is the predominant raw material in the debitage, accounting for 57 flakes or pieces of shatter. The piece collected in August 2001 is another broken flake of Smoky Hill jasper. Another 7 flakes in the museum collection are Florence cherts from the Flint Hills east of the study area. The remainder of the flakes are miscellaneous pieces of quartzite, probably from cobbles.

Discussion

For the reasons enumerated above, an identification of this site as Lower Loup/Pawnee seems supportable. It is not possible to assign a specific age, although, on ethnohistoric grounds, the chances would seem good that it dates no earlier than the late 1700s or early 1800s. Nor would I hazard an assessment of which Pawnee band occupied this camp. The use of Smoky Hill jasper might seem more consistent with a Skiri than a South Bands identification (Holen 1991), but further work would be required to make such an identification reliable.

Attempting to determine the function of 14OB6 within the Lower Loup/Pawnee hunting system is not particularly reliable on the basis of a surface collection, particularly since we know so little about the circumstances of its collection. That said, though, it might be notable that this small aggregate contains pottery, weapons, scrapers, fragments of bifaces, and debitage—a rather rich assemblage for its size and one completely consistent in content with what I elsewhere called a hunting base camp (Roper 1991:206-207). The recovery of a single bone during the August 2001 survey also fits the pattern, although we do not know for sure if this bone is from the site.

It is unfortunate that we will never be able to more fully investigate this site to better evaluate its assemblage, determine whether or not features were present, and search for evidence that could be used to place it more precisely in time. There must be more such sites out there, though, and I would solicit such information as anyone has and can provide.

Acknowledgements

I thank Jeanette Blackmar and Mary Adair for access to the 14OB6 collection at KUMA. The survey of the site area was conducted for the City of Osborne as part of a sewage system improvements project. I assured the city, however, that I had no knowledge of the nature of 14OB6 when I quoted them a fee and that they did not finance my trip to Lawrence for what arguably is personal research. And a note of

recognition to Linda Williams and my dog Bonnie for accompanying me in the field on one of those searingly hot early August days we had this year—at least Bonnie had the good sense to stay under the truck most of the time.

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Historical Archeology Projects Recently Conducted by the Kansas State Historical Society

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(formerly of the Kansas State Historical Society)

Two major and several minor historical archeology reports were completed during the past year by Marsha K. King at the Kansas State Historical Society [KSHS]. In February Marsha left KSHS to begin work in a newly created archeologist position in the Environmental Services Section of the Bureau of Design at the Kansas Department of Transportation [KDOT].

Hollenberg Pony Express Station

In September 2000 Marsha K. King completed Results of Archeological Metal Detector Survey in the vicinity of the Hollenberg Pony Express Station (14WH316), Washington County, Kansas. Between 1997 and 1999 KSHS staff archeologists, funded by a matching grant from the National Park Service [NPS], conducted metal detector survey designed to investigate the 160-acre parcel around the Station once owned by Gerat H. Hollenberg, including both publicly and privately owned land. Hollenberg's original 160-acre tract was located at the junction of four sections (including the SW ¼ SW ¼ of Section 2, the SE ¼ SE ¼ of Section 3, the NE ¼ NE ¼ of Section 10, and the NW ¼ NW ¼ of Section 11) in Township 2 South, Range 5 East in Washington County, Kansas. Historically this parcel was the location of a segment and creek crossing of the Oregon-California Trail, a trail campground at the Cottonwood Creek crossing, and the Hollenberg home, which served as a Pony Express Station and stage station. The Hollenberg Pony Express Station Historic Site, administered by KSHS, consists of part of the homestead with one historic building (Hollenberg's house and Pony Express Station) and a visitor's center. Outbuildings associated with the Hollenberg homestead are thought to have been located to the east on adjacent private property. Visible ruts of the Oregon-California Trail and archeological remains of the Cottonwood Creek campground are situated south of the state-owned historic site on privately owned land.

As part of the NPS sponsored project, previous archeological investigations at the site were reviewed; previously unstudied portions of the 160-acre parcel were investigated using metal detector surveys; additional archeological sites were documented and delineated; and artifact assemblages from these sites

were collected, processed, cataloged, and analyzed. The five sites now recognized in this vicinity are: the Hollenberg Ranch and Pony Express Station (14WH316), the Oregon-California Trail Segment & Cottonwood Creek Crossing (14WH333), the Cottonwood Creek Trail Campground (14WH334), an Historic Trash Dump (14WH335), and the Cottonwood Creek Prehistoric Site (14WH332). Historic land use within Hollenberg's 160 acres was investigated and locations of outbuildings contemporary with Hollenberg's use of the property and later farmstead activities were more accurately defined. The route of the Oregon Trail in the vicinity of the historic site was examined and the limits of the campground used by Oregon Trial emigrants were determined. Finally, maps were produced showing artifact concentrations and probably building locations to be used for future archeological research and cultural resource management purposes. Results of this survey and site analysis should provide useful information for better defining site boundaries, revising the National Register of Historic Places nomination form, and improving the interpretation of the Hollenberg Pony Express Station. Only a limited number of copies of this report were printed, so it was not widely distributed.

Five Historic Sites in Manhattan

In the winter of 1994 and the spring and summer of 1995, archeologists from the Kansas State Historical Society conducted intensive Phase III investigations in southeastern Manhattan, Kansas, to locate, evaluate, and document the remains of five historical sites: a residence (14RY380), a hotel (14RY381), a restaurant (14RY382), another residence (14RY383), and a blacksmith shop (14RY384). The sites were all located within 2 blocks of one another and were all expected to be destroyed to provide entrance/exit ramps for a new bridge alignment across the Kansas River on Kansas Highway 177.

At least five flood episodes during the last 150 years affected the four-block Kansas River Bridge Replacement project area and the subsurface deposits at the sites. Each flood buried previously-deposited cultural material under a layer of sterile alluvium. As a result, the sites were determined to have the potential of yielding pockets and layers of encapsulated features and artifacts that would reflect short-term activity histories. Such archaeological components could be used to infer the lifestyles of similar households and businesses in Manhattan (and elsewhere in Kansas) during each identified occupation period. This was the reason for Phase III archaeological investigations proposed at sites 14RY380, 14RY381, 14RY382, 14RY383, 14RY384, and 14RY365.

The Phase III historical archeological investigations determined that none of these sites retained sufficient integrity for listing on the National Register of Historic Places. Significant portions of each site had been damaged or destroyed by subsequent construction and land use activities. No evidence of structural remains or features associated with the Cedar Park House (117 Colorado Street) remained at 14RY381, which had served as a hotel or boarding house from ca 1885-1915. Two small refuse disposal features containing large quantities of artifacts associated with food preparation, food serving, and food remains were identified at the Johnson/Polmore Restaurant Site (14RY382), located across from the depot in the 100 block of Yuma Street. No structural remains of the restaurant, which operated from ca 1903-1920s, were uncovered. Remnants of a cellar and outbuilding foundations and several privy and trash pit features were identified at the Kalloch/Sigman/Burger Residence Site (14RY383) in the 300 block of South Wyandotte Street. This residence was occupied from ca 1860 to 1901. Remnants of the late-nineteenth-century blacksmith shop foundation and floor, as well as two privy pits associated with this shop at 322-½ South First (later Second) Street, were discovered at the ca 1872-1897 Rehfeld Blacksmith Shop Site (14RY384). Three other refuse disposal features and three utility features identified at the Blacksmith Shop Site were determined to have been associated with the domestic use of this lot by occupants of the nearby Residence at 322 South Second Street (14RY365). The site of the Hanagan/Nelson/Purcell Residence (14RY380) was destroyed before archeological work began.

Text for the report, Results of Phase III Historical Archeological Investigations of Five Historic Sites (14RY380, 14RY381, 14RY382, 14RY383, and 14RY384) in Manhattan, Riley County, Kansas, authored by Marsha K. King, Christopher M. Schoen, and Will Banks, has been completed and graphics should be finished soon.

Minor Reports

Among the minor reports completed during 2000 by Marsha King while at KSHS were two associated with the US-59 highway corridor between Lawrence and Ottawa. In Results of Phase III Historical Background Research on the John C. Davidson Farmstead Site (14DO333) within the US 59 Highway Improvement Corridor in Douglas County, Kansas, the conclusions based on archival research conducted on the Davidson Farmstead Site suggested that the site was likely the original ca 1854-1863 homestead of John C. and Sophie F. Davidson and was probably not occupied after 1863. The site was considered to be significant on the local level as a late-Territorial to early-Statehood period farmstead. The short occupation of the site by a

single family suggests that the site may provide an opportunity for archeological investigation of research questions regarding agrarian lifeways without the analysis challenges caused by long-term, multiple, and/or multi-generational occupations. This site was considered potentially eligible for listing on the National Register of Historic Places. Phase III field investigations were recommended to determine whether intact archeological deposits are present at the site.

The other report, Historical Background Research on Four Historic Sites Identified Within the US 59 Highway Alternate Corridor in Douglas and Franklin Counties, Kansas, investigated the history and locations of four sites lying in or near the proposed highway corridor in southern Douglas and northern Franklin counties. 1) The Josiah S. Fletcher Farmstead/Cornfield Skirmish Site (14DO331) was identified as a family farm established during the territorial period by the Josiah S. Fletcher family. On August 21, 1863, the cornfield behind Fletcher's farmhouse was the site of a skirmish between Quantrill's raiders retreating from Lawrence and the Free-State militia and military pursuing them. 2) A small town was established along the Santa Fe Trail about nine miles south of Lawrence in southern Douglas County during the territorial period. The town of Brooklyn (14DO330), alternately spelled Brooklin or Brookline, was incorporated by the territorial legislature in 1858. The vicinity had previously been platted, and/or incorporated as Hickory Point, McKinney Post Office, Salem, Louisiana, and Pacific City. After sacking Lawrence on August 21, 1863, Quantrill and his raiders rode through Brooklyn and set fire to several structures. The town was not rebuilt after this incident. Documentary evidence suggested that the dispersed community was located in the west part of Section 19, Township 14 South, Range 20 East, and the east part of Section 24, Township 14 South, Range 19 East, with the range line forming the central north-south road through the town. 3) A site in the SW ¼ of Section 24, Township 15 South, Range 19 East, in northern Franklin County was identified as the Reuben Hackett/W.H. Tennison Farm Site (14FR313). This was one of the earliest homesteads in the county, established by Reuben Hackett with the construction of a cabin on the site in early June 1854. The Hackett family owned and occupied this site until January 1867 when they moved a few miles west. Hackett, who played an active role in territorial politics, was one of the first justices of the peace appointed by Governor Andrew H. Reeder. He fought with John Brown during several incidents, was injured at the Battle of West Port in 1856, and served during the Civil War in Captain James' Company in Pennock's Regiment. Hackett opened and developed a coal mine on Hackett's Hill in northern Franklin County. The site was apparently occupied by William R. and Martha J.

Briles (1867-1881) and subsequently by the W.H. Tennison family (1883-1905). 4) Little information could be obtained about the Potter Cemetery (Franklin County Cemetery #47). Records suggest that at least three internments were made during the 1850s, all apparently members of the Mewhinney family. Displaced stones indicate the interments as: "Ray Mewhinney" (probably the son of Thomas J. and C. Mewhinney), who died April 21, 1855, aged two years, ten months, eight days; "FM" (possibly Fremont Mewhinney, the son of Samuel and D.M. Mewhinney), who died July 24, 1855, aged eight years, one month, and 25 days; and "Catherine Meuh" (probably Catherine Mewhinney, the wife of Thomas J. Mewhinney), who died December 25, 1862. The exact location of the cemetery is unclear as no headstones remain in place and the presumed location has been plowed.

Since the proposed route of the US-59 highway alignment did not impact the Josiah S. Fletcher/Cornfield Skirmish Site, the Brooklyn Town Site, or the Reuben Hackett/W.H. Tennison Farm Site, no further archeological investigations were recommended at these three sites. Since the exact location of the Mewhinney internments in the Potter Cemetery could not be determined, archeological testing and/or site monitoring was recommended should this highway corridor alternative be selected.

Data Recovery Investigations at the Site of Fort Ellsworth (14EW26)

Robert J. Ziegler
U.S. Army Corps of Engineers, Kansas City District

The Fort Ellsworth site is located on Federal Government land at Kanopolis Lake, Ellsworth County, Kansas. In June, 1996, the Kansas Archaeology Training Program (KATP) was held at Fort Ellsworth and nearby Fort Harker. In June, 2000, the KATP returned to Fort Ellsworth. Sponsors for both training programs at Fort Ellsworth were the Kansas State Historical Society, the Kansas Anthropological Association, and the U.S. Army Corps of Engineers, Kansas City District. Corps archaeologist Robert Ziegler served as principal investigator.

Fort Ellsworth was established in June, 1864, to secure routes of transportation and protect local settlements from Indian attacks. Company H of the 7th Iowa Cavalry, under the command of 2nd Lieutenant Allen Ellsworth, constructed the fort

along the Smoky Hill River near the junction of two trails, the Smoky Hill/Denver Express Road and the Fort Riley/Fort Larned Road. Built only as a temporary installation, the fort consisted of hastily-constructed dugouts and log huts. A succession of troops served there, including Company C of the 2nd U.S. Volunteers, one of the units of "Galvanized Yankees," or Confederate prisoners who earned their release from prison by volunteering for Western duty. In November, 1866, Fort Ellsworth was renamed Fort Harker, and the following year a new Fort Harker was established on higher ground approximately one mile to the northeast while the old site along the river was abandoned. Fort Harker is well documented in the historical record and four of its buildings remain standing. On the other hand, Fort Ellsworth is poorly documented and consists solely of subsurface remains. Extensive historical research at the National Archives, the Kansas State Historical Society, and other archives has failed to locate plans, sketches, or photographs of Fort Ellsworth.

Research at Fort Ellsworth in 1996 focused on a better understanding of: (1) the fort's physical structures; (2) everyday life at the fort; and (3) the Frontier Army's commitment to supplying the fort. A systematic metal-detector survey, and unit and block excavations were undertaken at Locality 6 at Fort Ellsworth, which contains a series of 14 depressions along the high bank of the Smoky Hill River near the swale of the Fort Riley/Fort Larned Road. Block excavations at two of these depressions exposed the remains of the post bakery and a living quarters. The bakery was an 18 x 14 ft. dugout constructed by setting logs vertically in a trench, a method known as *poteaux en terre* construction. At the back of the dugout, carved into the high bank, was a 10 x 6 ft. bakeoven constructed from large flat sandstones and arched over with soft hand-made bricks. The second dugout, a 19 x 15 ft. quarters also constructed using the *poteaux en terre* method, featured a sandstone fireplace.

Analyses of the archaeological data recovered in 1996 have produced interesting results. An analysis of the faunal assemblage by John Bozell (2001) indicates a diet dominated by cattle, swine, and chicken with smaller amounts of deer, pronghorn, rabbit, fish, and turtle. Large domestic mammals comprise 70% of the sample by number and 96.6% by bone weight. Botanical remains analyzed by Mary Adair (2001) represent a mix of both domesticated foods and locally-available wild plants. In analyzing the artifact assemblage, Richard Fox (2001) suggests that Fort Ellsworth's troops were supplied with then-modern arms, equipment, and accouterments, but poorly furnished with construction materials. Ziegler (2001) explains that the substandard physical facilities at Fort Ellsworth can be understood in terms of an Army policy that usually did not provide for the expense of more substantial physical facilities because the Indian

frontier shifted frequently and was expected to soon disappear altogether. When Army officials perceived that there was a need for a continued military presence in the region, they were willing to incur substantial costs to build a "permanent" Fort Harker.

The 2000 data recovery investigations at Locality 5 of Fort Ellsworth focused on three large features (surface depressions) some 100 meters north of the dugouts investigated at Locality 6 in 1996. Dugout floors and wall lines were identified in two of the features, however the function of the third feature is unknown. Clay was used extensively in the construction of one of the dugouts. Evidence of the *poteaux en terre* method, or any form of log construction, was absent. Military insignia, a variety of other artifact types, and food remains, were recovered from all three features. Interestingly, the presence of women is suggested by small decorated mother-of-pearl buttons, an intact pin with yellow-colored stones, several jewelry fragments, and portions of a watch.

Currently there are no plans for further archaeological work at Fort Ellsworth. Corps personnel monitor the site and additional protective measures will be implemented in the future. For a complimentary copy of the report of the 1996 investigations, contact Bob Ziegler at robert.j.ziegler@usace.army.mil or 816-983-3138. A forthcoming report will detail the 2000 investigations.

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Archaeology at Wichita State University

Donald J. Blakeslee
Wichita State University

Field Research

Donald Blakeslee continues work on the Jimmy Owens site, a Coronado-era campsite in west Texas. Coronado's army had two main campsites in Texas, with the longest occupation being only two weeks long. All of their other camps were occupied only for a single night and are not likely to have left much of an archaeological footprint. It is likely that the Owens site is the second of the two longer-term camps, one at which the army stayed for two weeks before proceeding back to New Mexico.

The most recent work at this site has finally begun to reveal an internal structure to the site. Work at the Owens site has been hampered by the presence of post-Coronado materials over the whole surface, materials that date between about 1750 and the present. Indeed, the later metal objects far outnumber those from the Coronado occupation and are not well separated from them stratigraphically. This has meant that the Coronado-era signal has been swamped by the later material, no matter what technique was used to detect the metal targets.

To resolve this difficult, a ten meter wide transect of the whole site (350 meters long) was gridded and mapped with metal detectors. Each target was excavated, and pin flags were left to mark only the Coronado

materials. (All Coronado materials were collected and replaced with plastic beads so that the exact locations of the metal targets are preserved but the metal will not interfere with magnetometer surveys planned for the future). This procedure revealed four concentrations in a 250 meter span of the transect. Metal detectors were then used to survey around the excavated concentrations, with all targets flagged but not excavated. This survey was extended in all directions until the density of targets fell off.

The result was four fairly linear distributions of metal artifacts, up to 70 meters long and 10-20 meters wide. These were roughly parallel to one another and separated by distances of 60-70 meters. The transect happened to run at a diagonal to the rows of targets, and when an area not yet cleared of mesquite trees was checked to the west of the four concentrations, a fifth one was found but could not be mapped until the trees are cleared. Of interest is the fact that the muster roll of the expedition lists five standard bearers, apparently one each for the five units of the site.

We had planned to do a magnetometry and resistivity survey of the transect and may still do so, but such survey of one or more of the concentrations of targets would be more likely to produce useful information about how the camp was laid out. Luckily, one of the excavated targets turned out to lie in a hearth, so that when the magnetometry survey is done, we can compare the results to a known hearth. This is important, because all of the hearths discovered so far are poorly preserved because the Spaniards camped on a surface that remained stable for hundreds of years, allowing scattering of the material from the hearths.

Most of the metal targets turned out to be nails, some of which were used as horseshoe nails. Evidence that the Spaniards were conserving iron comes from the used horseshoe nails. We found more snipped-off nail tips than head and shank portions, even though the tips are much smaller and hence harder to detect. At the same time, however, there are a sizeable number of nails that were not used in horseshoes, and we suspect that these were used to build temporary shelters.

The next trip to the site will focus on locating the Mexican Indian portion of the camp. The muster roll indicates that Coronado had about four times as many Mexican Indian allies with him as Spaniards, people who probably had little access to metal artifacts. The fact that the Spanish artifact distribution ends about 70 meters from the edges of the river terrace suggests that the camp may have consisted of a Spanish core surrounded by Indian allies. Since metal detectors have not located Coronado-era artifacts in this zone means that we will have to use other techniques such as trenching in order to detect diagnostic materials. The Mexican Indians may have left behind obsidian or diagnostic pottery.

WSU continues to work with the Bureau of Reclamation surveying reservoirs in Kansas and Nebraska. In the summer of 2000, we spent ten days each at both reservoirs. Cedar Bluff Reservoir yielded only two sites, both early historic farmsteads. One has been almost entirely erased by the construction of a camping area in the state park. Evidence of the site came to light only when an early atlas of the county was consulted. It showed the location of the site, which was then located on a recent aerial photograph. It was barely visible on the aerial, however, as a very faint crop mark. The original pedestrian survey had not detected the site, and when the spot was revisited, only a very faint depression could be seen. All of the material remains had been bulldozed away and the campground resodded, leaving a faint footprint that the original survey had not detected.

The second farmstead was seen first as three crop marks on an aerial photograph. When the spot was visited, artifacts were few, even though the site was in an agricultural field. A trash-filled depression was found in some high weeds beside a creek, and the old road crossing was still visible in the creek banks. Both sites are rather extreme examples of the extent to which the historic farmsteads have been destroyed around some of the reservoirs in Kansas.

The summer of 2000 was the second year that WSU has surveyed at Red Willow Reservoir. As in the previous year, most of the effort was dedicated to shoreline survey, as erosion has destroyed and is destroying important sites along the shoreline. And, as in the previous year, many sites were found. We tested a damaged earthlodge site near the upper end of the reservoir and found that it still contained some intact deposits. It is a Middle Ceramic period site, as are many at Red Willow. Archaic, Early Ceramic, Late Ceramic and Historic sites are also present. No Paleoindian sites have been found yet, even though deposits of the right age are exposed at the upper end of the reservoir.

The Red Willow Creek valley is rich in sites because it was well-wooded and well-watered in prehistory. There are not as many sites as at Medicine Creek because there are no outcrops of chippable stone. The Middle Ceramic period materials have been called Upper Republican in the past, but there are some distinct differences between them and the Upper Republican remains from Medicine Creek. One of the most noticeable of these is a high frequency of handles on the pottery vessels, including effigy handles. A ceramic bird effigy pipe was collected in 2000 from the same shoreline site that yielded a small pot with frog effigy handles in 1999.

A crew of ten people spent a week in Yellowstone National Park at the invitation of the Park Archaeologist, Ann M. Johnson. We used two days to survey a section of the shoreline of Yellowstone Lake near one of the campgrounds. It is a spot

that may be impacted by expansion of the tourist facilities. We found that the shoreline was more-or-less one continuous archaeological site. The lake has been fairly stable since the glaciers melted over 9,000 years ago, and shoreline erosion has littered the beach with materials. Wave action has distributed them widely along the beach. The objects that have been exposed for long periods of time are completely rounded by wave action and abrasion by the beach sand, while recently eroded objects are still sharp-edged.

The hottest find on the shoreline was a Cody complex site, the oldest site in the park found in good context. We found a midsection of an Eden point, the base of a Scottsbluff point, and two complete Cody knives. After we left, the park had a Canadian crew test the site, and they found another two Cody knives and a shaft abrader. The diameter of the groove in the abrader exactly matches the widths of the stems on the Cody knives, which are of the variety that have a second, narrow and angled shoulder. We have been invited back to test the site more thoroughly in 2001.

The rest of the week, we performed a survey along the Gibbon River around the Norris geyser basin. We found sites along the edges of the floodplain, many of which were exposed by fallen trees that had obsidian flakes trapped among their roots. Cobbles in the river contain the obsidian from Obsidian Cliff, and visitors to the region used a lot of it. The only diagnostic tools we found in the sites were a pair of small points with rounded stems which were not familiar to the Park Archaeologist.

Laboratory Research

David Hughes is on sabbatical, working up a series of publications dealing with the Buried City complex. This set of sites on Wolf Creek in the Texas Panhandle is more closely related to the Wilmore complex of southwestern Kansas than it is to the adjacent Antelope Creek phase. Indeed, it was the inclusion of pottery from one Buried City site that led to the idea that Antelope Creek derived from a migration of Upper Republican people from western Kansas and Nebraska. Buried City assemblages include some collared rims and a farily high frequency of decorated vessels, both traits of Upper Republican, while Antelope Creek sites yield almost no collared rims and very few decorated vessels. Work on the Buried City sites was funded by the landowners and included a field school of the Texas Archaeological Society.

Donald Blakeslee is working with Bob Blasing of the Bureau of Reclamation on a major research project that involves Native American sacred sites, trails and (of all things) meteors. They have discovered that there were a series of meteorite shrines scattered across North America, one of which is associated with the Brenham meteorite field of southwestern Kansas. A rock art site associated with the spot where the meteorite fell depicts stars,

constellations and shamans, one of whom is holding a star in his hand. Pieces of the Brenham meteorite have been found in Hopewellian burial mounds in Ohio, indicating that knowledge of the meteorite field extends back at least to the early Christian era.

Blasing's research into sacred sites is an important part of the project. Several years ago, he showed that the Pike's Peak area was one of the most important Pawnee shrines, even thought it lay outside Pawnee territory. One of the most important features of the shrine was the set of four red sandstone pillars at the Garden of the Gods. Another such site, also called the Garden of the Gods, exists in Ohio. A third lies in the Superstition Mountains, sacred to the western Apaches.

WSU students are currently working on several projects that may have a broad impact. Three of the projects utilize X-ray fluorescence to determine the trace elements present in archaeological materials. This is a non-destructive technique that analyzes the spectrum produced when a target material is bombarded with X-rays. Semi-quantitative results are in the form of weight percentages of the elements that the analyst chooses, so that it is possible to remove the contribution, say, of calcium in shell and bone tempered sherds.

Wade Davis and Colleen Nicholas are using X-ray fluorescence to analyze ceramics from Great Bend Aspect campsites. Such campsites are widely distributed across Kansas, from at least as far north and west as Waconda Lake on the Solomon River, east into Missouri. The far-flung distribution of the campsites contrasts with the distribution of village sites, most of which are concentrated in three locations in Rice and MacPherson counties, in the vicinity of Marion and around Arkansas City. Wade and Colleen are analyzing potsherds from the campsites and comparing them to ceramics from the village sites in order to determine which village clusters might have been the point of origin for the people who created the camps. Their results should be comparable to those generated by studying the stone sources present in the home villages.

Susan Zurowski is using the same technique to investigate the nature of the ceramic assemblage at an ossuary site. The bulk of the material from this site was not associated directly with the human remains, making interpretation difficult. She is analyzing samples of pottery from the site and comparing them to samples from the habitation sites around Waconda Lake. To the extent that multiple communities contributed materials to the ossuary, the variance in the pottery from it should be larger than that in the individual habitation sites. The same analysis may help to reveal which habitation sites contributed material to (and possibly human remains) to the ossuary site and may reveal whether or not more distant sites also contributed.

Patrick Stanton is using the same technique to look at trace elements in animal bones. The bulk of the faunal assemblages from archaeological sites is not identifiable beyond gross categories such as bird, small mammal, and so on. Patrick is trying to detect trace element differences that would allow better classification of otherwise unidentifiable scraps. His results so far, applied to bones of modern animals from the comparative collection, show that, as expected, strontium levels alone distinguish carnivores from herbivores. Other elements, such as copper and manganese, even separate various carnivores, such as raccoon, coyote, bobcat and mink. Much more work will be needed to determine the extent to which animals of a single species from different regions differ in their trace element content and the extent to which diagenesis (post-depositional chemical changes) might affect the trace element levels.

A class project is beginning an experiment to help to determine how long prehistoric houses lasted. The students have acquired samples of a wide variety of tree species, in varied diameters. These will be erected in two different kinds of settings – upland and stream terrace – in the Flint Hills and in eastern Nebraska. Some will be placed in spots where only the sod has been stripped from the ground surface; others will be placed in the equivalent of house pits. They will be re-examined over a period of years to determine the rate at which they rot. This information will supplement Donna Roper's actualistic work of three years ago, when she dismantled a reconstructed earthlodge in southwestern Nebraska.

News from the Kansas State Historical Society

Robert Hoard, State Archaeologist
Kansas State Historical Society

NAGPRA, UBS

KSHS is coordinating with the University of Kansas to carry out compliance with the Native American Grave Protection and Repatriation Act (NAGPRA). We currently are in negotiation with 14 tribes with historical ties to Kansas to repatriate the remains of American Indians and associated burial goods from KSHS and from universities, federal agencies, and other museums in the state. We are working to have an agreement signed by the Spring of 2002 that will allow these materials to be transferred to the tribes.

We have reactivated the Unmarked Burial Site Preservation

Board, which, after a significant hiatus, has met four times since April of 2001. Among the accomplishments of the board are the establishment of permits for the excavation, study, display, and reinterment of human remains and grave goods; issuance of permits for reburial of Pawnee remains, which took place October 1 at the Pawnee Indian Village Museum; permission to proceed with the establishment of a UBS cemetery at Lake Scott State Park, and development of draft regulations.

Geomorphological Studies

A comprehensive, statewide study of geomorphology and site preservation is drawing to a close. This study is supported by the Intermodal Surface Transportation Efficiency Act (ISTEA) and the Transportation Equity Act for the 21st Century (TEA-21) through the Kansas Department of Transportation. When completed, it will allow agency planners and land managers to better predict the location of buried archaeological sites. This will expedite and simplify project planning and enhance site protection. It also will serve as a research tool for archaeological research in the Central Plains. The first report is scheduled to be available in 2002.

Archeology Books

KSHS staff are working on the production of two books on the archeology of Kansas. We are developing one as an attractive, table-top book designed for a general audience. Our goal is to print 5,000 copies of this book, to be entitled "The Archaeological Heritage of Kansas' for free distribution. We are working to have the book laid out and ready to print in 2002. The second book—"The Archaeology of Kansas: A Record of 12,000 years of Human Occupation in the Central Great Plains"—will be an edited volume. Twenty authors from regional universities and museums have committed to the volume, which is on a time line for publication in 2003. This volume will serve both as a textbook for Kansas archaeology and a basic reference for archaeologists, land managers, and those members of the public who wish to have a broader understanding of Kansas' distant past.

Web-Based access to Cultural Resources information

KSHS has a wealth of information on historic buildings and bridges and on archaeological sites in our files. We are working to enhance public and professional access to these resources using web-based technology through two projects. The first is to allow web access to our historic sites files. Our database will be upgraded and loaded on the web so researches can actively search and find information on historic properties, including pictures. The second is the development of spatial information through a geographic information system (GIS) coverage showing all archaeological sites recorded in Kansas that also will be web-accessible. To prevent unauthorized collecting and excavation of sites, access to this information will be

restricted and controlled by KSHS cultural resources staff. Funding for this project comes from the Intermodal Surface Transportation Efficiency Act (ISTEA) and the Transportation Equity Act for the 21st Century (TEA-21) through the Kansas Department of Transportation. Web access will be carried out through the Data Access and Support Center (DASC).

Kansas Archeology Training Program Field School, 2001

VirginiaA. Wulfkuhle, Public Archeologist
Kansas State Historical Society

The Kansas Archeology Training Program (KATP), a cooperative effort of the Kansas State Historical Society (KSHS) and the Kansas Anthropological Association (KAA), has proven mutually beneficial to both organizations. The KATP offers participants an opportunity to learn archeological concepts and methods through hands-on experience and classroom instruction under the supervision of professional archeologists. In 2001 the traditional sponsors were joined by the Atchison Lewis and Clark Planning Committee and received additional assistance from the Kanza Chapter of the KAA, Atchison County Historical Society, Atchison Area Chamber of Commerce, and other local groups.

The June 2-17 investigation concentrated on archeological survey and testing in the Deer and Independence Creek valleys of Atchison and Doniphan counties. Seventy new sites were recorded, and test excavations were performed at six known sites. Prehistoric sites encountered dated from the Middle Ceramic (Pomona variant, Steed-Kisker phase, and Nebraska phase), Woodland, and Archaic (including Nebo Hill phase and other late Archaic cultures) periods. Historic sites consisted of early farmsteads and town sites; none relating to Kansa, French, or Lewis and Clark occupation were recognized. One of the tested sites (14AT438) may be eligible for the National Register of Historic Places (see Kansas Preservation 23(5):11-12.

Other components of the project were a field lab, four formal classes (Historic Buildings Survey, Northeast Kansas Prehistory, Archeological Site Survey, and Introduction to Lithic Identification Techniques), and many associated programs. Over the 16-day period, 154 volunteers contributed 5,418 hours of skilled labor. Will Banks, Anita Frank, Christine Garst, Bob Hoard, Martin Stein, Randy Thies, and Virginia Wulfkuhle committed full time to the project. Tod Bevitt, Tim Weston, and Christy Davis participated for part of the time. Three other professional archeologists donated time to the project: Jim Feagins, Brad Logan, and Bert Wetherill.

Preliminary reports of the project were published in Volume 23, Nos. 4 and 5 of Kansas Preservation. Brad Logan will produce a technical report and other products under contract with the KAA, made possible by a grant from the Courtney S. Turner Charitable Trust.

A Preliminary Sketch of Non-disturbing Documentation of Selected Artifacts from Certain Unmarked Burial Sites in Kansas: The Use of CAT Scans and X-Rays

Jim D. Feagins
Archaeological Consultant, Grandview, Missouri

This ongoing CAT scan & X-ray artifact documentation is somewhat of a footnote to a larger study of burial artifacts from Kansas. The general and much larger study is an effort to determine tribal affiliation in compliance with the Native American Grave Protection and Repatriation Act (NAGPRA) and to enhance the information on the collections held by the Kansas Unmarked Burial Sites Board as established by the Kansas Unmarked Burial Sites Act of 1989. These collections are currently stored at the Kansas State Historical Society and are subject to the requirements of NAGPRA &/or the state's UBS law.

Realizing that certain artifacts could not be thoroughly documented by ordinary macro and micro light photography, an effort was made to determine if CAT scans and X-rays would be useful in this regard. It is well known that these techniques are non-disturbing and non-destructive, which, of course, were important requirements. The goals of this ongoing CAT scan and X-ray study are three fold: (1) to document certain types of burial artifacts, (2) to provide a method to obtain additional information from artifacts, and (3) to determine the usefulness and limitations of these non-destructive methods for the analysis and documentation of certain types of materials.

So far, fifteen artifacts from seven sites (in Doniphan, Jewell, Hodgeman, Logan, Osborne, Pottawatomie, and Wyandotte counties) were examined by either CAT scans and/or X-rays at Independence Regional Health Center, in Independence, Missouri. Health Center staff, Randy Ritchie, CAT Scan Technician, and Rory Ritchie, X-ray Technician, (under the general direction of this author) recorded and enhanced the images produced for this study. Native American, Harvey P. Fritz, observed the procedures. He is part Dakota and a member of the Crow nation and actively participates

in both the local and the Montana Native American communities. Mr. Fritz's observer qualifications are also enhanced by his position as Resource Director for Health-Midwest Radiology.

The Computed Axial Tomography (CAT) scan equipment used in this study was a Marconi MX8000 (multi-slice helical scanner). The computer software and hardware were designed specifically for this equipment. They were all designed simultaneously and presented as a package by the manufacturer. The program allows a multitude of views from any direction, 3-dimentional images presented from any rotation with cutaway views, transparent views combined with various cuts, and color coding of various densities of materials.

The X-rays were done with a mobile OEC fluoroscope with a C-arm. This had a number of advantages over some standard X-ray equipment. Artifacts could be rotated to different positions and the diverse images and the results of varying intensities of X-ray kilovolts could be examined immediately on a monitor and, if desired, saved to a hard-drive for later printing on paper or X-ray film.

The artifacts were made of various materials including stone, plant stems, shell, horn, hair, wood, glass, German silver, iron, and brass. Among the artifacts examined were: a gray siltstone pipe, a catlinite pipe with plug, non-woven plant stems (from a fine stemmed monocot such as a species in the genus *Eleocharis* or *Juncus*) located between unidentified non-fibrous layers (preserved by close association with brass bracelets), marine shell beads from immature individuals of *Polininices uber*, a can of percussion caps, a rusted mass of iron tinklers, an iron bit from a horse bridle, a German silver hair tube with hair extender, a powder horn, metal lace, multi-layers of compacted cloth (some containing rows of small, hidden "bullet" buttons), and stacked iron pans with intermediate sized glass beads rusted in place. Already the project has proven to be far more successful than originally envisioned.

Clearly CAT scans and standard X-rays are both quite useful tools for documenting selected examples of different types of artifacts. Also a number of discoveries of previously unknown information were made using these techniques. Plus, we are learning more about the capabilities of CAT scans and X-rays when used on different sizes and arrangements of different kinds and thickness of materials.

While they both use X-rays to penetrate objects, CAT scans and X-rays each have their strong points and neither method can totally replace the other. Standard X-rays will always produce transparent views of an object. When used through a fluoroscope and combined with a computer program, it becomes a very handy and relatively economical (when compared to CAT scans) means of identifying and recording the oftentimes hidden structures within

artifacts. CAT scans with their computer programs can manipulate the billions of bits of information they record to produce a multitude of ways to view artifacts. These include views of slices of the internal structure of artifacts made from any plane. It can produce 3-dimentional images presented from any rotation and often combined with cutaway views. CAT scans can present transparent views combined with various cuts and can color code various densities of materials and isolate those for better viewing. The down side of these non-intrusive methods, especially the CAT scans, is the expense to produce them.

Both methods appear to not work as well for recording very small objects and small structures within artifacts, and they are certainly not designed to record microscopic or near microscopic features. Some types of metals and their arrangement and densities can also cause problems with each of these methods. However, these weaknesses can often be compensated for by using various techniques including computer manipulation to enhance the visual images and present different perspectives. Both CAT scan and X-ray methods are tremendous tools, useful to document and identify certain archaeological materials. Through these non-intrusive methods we can obtain visual images of certain artifacts that are truly amazing.

Acknowledgments

First and foremost I give thanks to the Ritchie brothers, Randy and Rory, for their awe inspiring expertise with CAT scans and X-rays and their willingness to donate (on their own time) the hours necessary to produce and enhance these images. I also thank Harvey P. Fritz, Native American observer and radiology Resource Director for 13 Health Midwest hospitals, and Linda Dunaway, a radiology supervisor, and other administrative staff at the Independence Regional Health Center for permission to use their facilities and equipment. Without their assistance this study would have been impossible. Tim Weston, Craig Cooper, and Barry Worley of the Kansas State Historical Society, along with this author, photographed and/or processed the color slides and B/W prints reproduced from the CAT scan color monitor and from the X-ray film. I also wish to thank Randall M. Thies, Archeologist, and Robert J. Hoard, State Archeologist, both from the KSHS, for giving their blessing to conduct this special documentation study.

The paper presented herein is greatly modified from two variations of papers presented at the joint 43rd annual Caddo Conference and the 23rd annual Flint Hills Archaeological Conference at the Sam Noble Oklahoma Museum of Natural History, University of Oklahoma, Norman, Oklahoma, on March 16-18, 2001, and at the joint meeting of the Missouri Archaeological Society and the Missouri Association of Professional Archaeologists at the Ramada Inn, Columbia, Missouri, on April 27-29, 2001.