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NOTES

NEW POINT TYPES FOR THE STATE OF KANSAS

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Previously very few point types have been defined based on collections from Kansas. In contrast Texas, Oklahoma, Missouri, and Illinois have been centers for the definition of types. This paper presents a series of newly defined types that are based on collections from Kansas, made primarily by avocational collectors.

The point types presented here are based on study of thousands of points from Kansas and Oklahoma, done in preparation for writing a guide to the point types of the Great Plains. The guide was made possible by development of a new technique for illustrating the range of variation within each type, called Stacked Outlines (SOs) because it consists of a stack of the outlines of individual points, aligned in the area of least variation, which is always in the shoulders-to-base region (Figure 1). The outlines are computer generated from digital photographs so that there is no error in the shapes, and it is possible with the computer to indicate by color which edges have been broken. Here, broken edges are drawn with gray lines. As the examples in Figure 1 show, the variation within types usually lies mostly in the blades, which are subject to breakage and resharpening with each use. Each type has its own particular pattern of blade maintenance, so that even broken specimens can sometimes be assigned to the correct type. Thus, the Grand points on the left were resharpened most frequently near the tips of the blades, while Snyders points (middle) were usually reflaked along the whole lengths of the blade edges. Montell points (right) also were resharpened along the whole blade edges, but unlike almost all other types, they lack standardization in the size and shape of the haft elements.

Even though sites in Kansas contain an amazing variety of point forms, few types have been defined using Kansas assemblages. The exceptions are Munkers Creek (Witty 1982), Walnut Valley (Grosser 1973), Hollenberg (Horst 2001), and Shadid, which was based partly on Kansas specimens (Wyckoff and Jackman 1988). Thus the majority of point identifications in Kansas assemblages are based on definitions from other states, as

far away as New York in the case of Lamoka points. This turns out to be a very important finding: point types do not vary across space, even when their distributions are very large. This is what allows identification of Lamoka (first identified in New York), Apple Creek (Illinois), and Clovis (New Mexico) points in Kansas collections. Those large distributions imply that differences between point types seldom functioned to mark ethnic differences. Most point types have distributions far larger than the territories occupied by distinct societies in the historic period.

But a large number of Kansas specimens go untyped or are misidentified because they are examples of previously undefined types. It is here that SOs have proven very useful because they allow the sorting of points from many small collections into clear-cut types without having a set from an unmixed excavated component to help identify the type.

In fact, SOs allow comparison of similar sets of points to determine whether one or two types are present. One example is given in Figure 2. It compares Resser points, defined here, with the Bandy type from Texas. Although they have strong similarities, there are also consistent differences. Resser points have been found in the Flint Hills of Kansas and appear to date after 1800 B.C. (Grosser 1973:Fig. 4). Bandy points are centered on the Lower Pecos region of Texas, with some examples found in central Texas (Prewitt 1995:91), dating somewhere between 4900 and 2500 B.C. Stem dimensions barely differ, except that Resser stems are shorter. The angles of the notches average 28.2 degrees on Bandy points, with a range of 21–42 degrees. On Resser points the notch orientation is 38.5 degrees, with a range of 32–47 degrees. The notches on Bandys expand slightly toward the base,

Figure 1. Stacked outlines of Grand, Snyders, and Montell points.

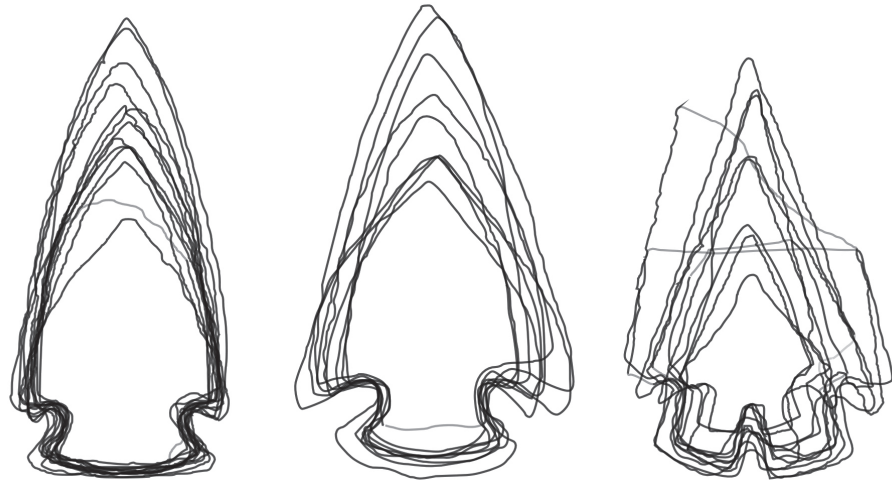
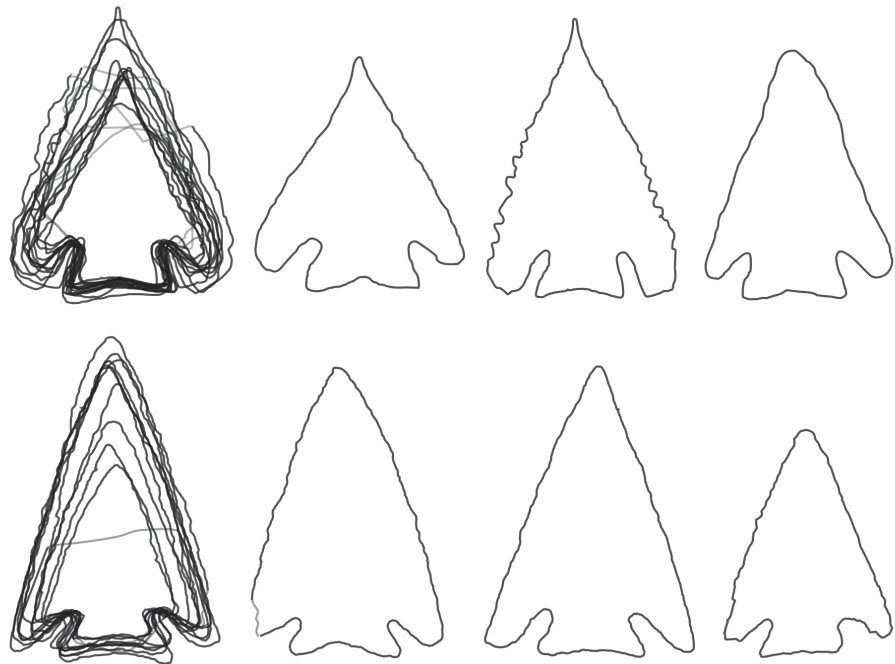


Figure 2. Bandy points (top) compared to Resser points (bottom).



but those on Ressers are parallel sided. Newly made Bandy points have blunt tipped barbs, while Resser points begin their use life with pointed barbs. Finally, some Bandy points have needlelike tips, and others are serrated. Both of these features are absent in Resser points.

Another pair of similar types is Munkers Creek and Karnak. Witty (1982) noted two variants of Munkers Creek at the William Young site: stemmed and lanceolate. Karnak points (Winters 1963:25), defined originally in the Wabash River valley in Illinois, also occur in straight-stemmed and lan-

ceolate forms (note that Perino [1985:198] ignores the stemmed form of Karnak). As can be seen in Figure 3, the two point types are not only similar in shape, but the age estimates are essentially the same. Nevertheless, the two types differ systematically. Munkers Creek points have sloping shoulders, slightly concave stem edges, and straight to convex bases. Karnak points have more horizontal shoulders and straight stem edges and bases. The lanceolate form of Munkers Creek has a slightly concave base, while that on the lanceolate variety of Karnak is convex.

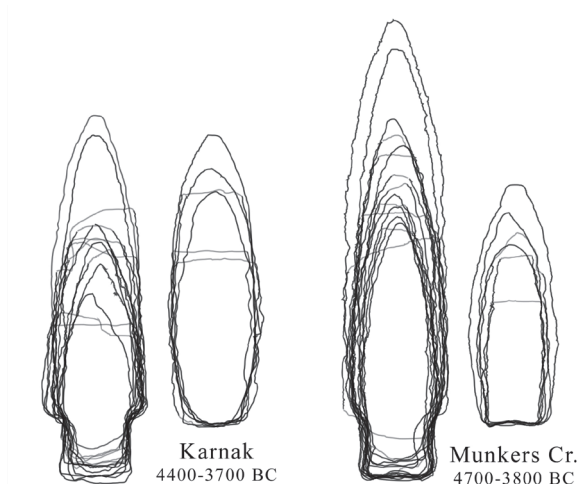


Figure 3. Comparison of Karnak and Munkers Creek points.

NEWLY RECOGNIZED TYPES FROM KANSAS

Previously, only the four point types mentioned above were defined on the basis of Kansas collections. In the following pages previously unrecognized types found in Kansas collections are illustrated and named. For each a verbal description, a stacked outline, and photographs of representative specimens are provided. Because most of the assemblages are from surface collections, age estimates for only a few of the types can be given, and other kinds of artifacts that might be found with them is uncertain. This set does not encompass all previously unidentified types in Kansas; they are merely the ones for which a large enough sample is available to be sure of the range of variation. Collectors with examples of other types should feel free to contact the author at donald.blakeslee@wichita.edu.

BIG EDDY (Figure 4)

Some type definitions have grown fuzzy over time, as various people have assigned similar but not identical points to a definition. In other cases original definitions have been subdivided when it became clear that more than one discrete type was present. Big Eddy points are an example of the first situation. Previously, they were assigned to the Williams type, even though their size and shape differ from the examples in the original definition. At

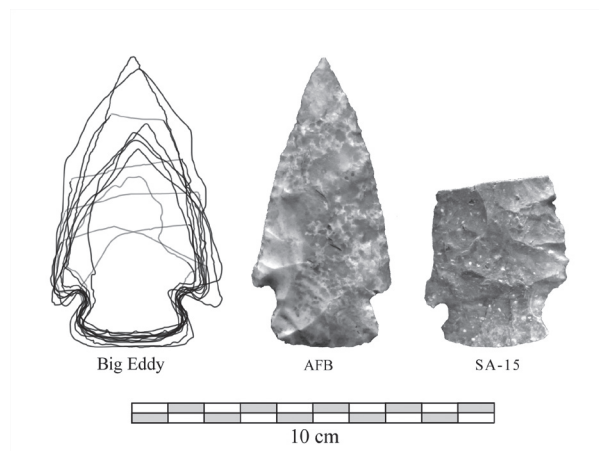


Figure 4. Big Eddy points.

the Big Eddy site they were found with fire-cracked rock and nutting stones in a level that dated 2570 B.C. (Ray et al. 1999). Williams points, on the other hand, have been dated to approximately 650–300 B.C. in Texas.

BRENDY (Figure 5)

This elegant point type is named for Brendy Allison, who was responsible for recording the hundreds of sites that she and her father, Dick Stauffer, had collected. The flaking pattern is similar to that on well-made Etley points, but these specimens are considerably wider than Etleys and have shorter stems. Stem width is slightly greater than that of the widest stemmed Smith points, but the blade shape is entirely different. Bases are straight to slightly convex with fairly sharp corners prior to breakage. All of the specimens seen so far are from the central Flint Hills. Their age is probably similar to that of Etley points, around 3000–2000 B.C.

BUTLER (Figure 6)

Named for Butler County, this type is tentatively defined on the basis of a few specimens from the Walnut River valley of Kansas that do not fit readily into previously defined types. They have triangular to lanceolate blades and gently sloping shoulders. Stems expand only slightly and meet fairly straight bases at square to rounded corners. Their age is un-

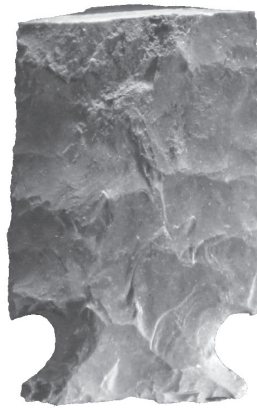
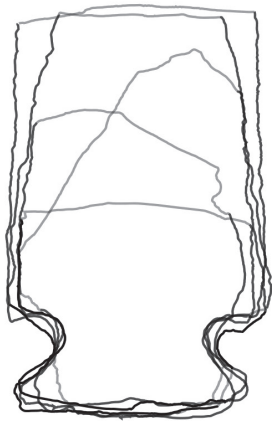


Figure 5. Brendy points.



Figure 6. Butler points.

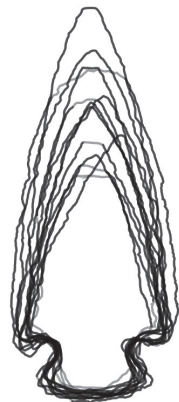


Figure 7. Cambridge points

known, as all specimens have come from surface collections.

CAMBRIDGE (Figure 7)

Named for the town in the Walnut River basin, these points have triangular blades with rather modest barbs. Corner notches are somewhat open and oriented at about 50 degrees from vertical. Bases are

convex with sharp to rounded corners. Examples have been found in the southern and central Flint Hills. The age is currently unknown.

CASSODAY (Figure 8)

Named for the town in the Flint Hills, this corner-notched form is thin and finished with pressure flaking. Blade edges are straight to slightly convex

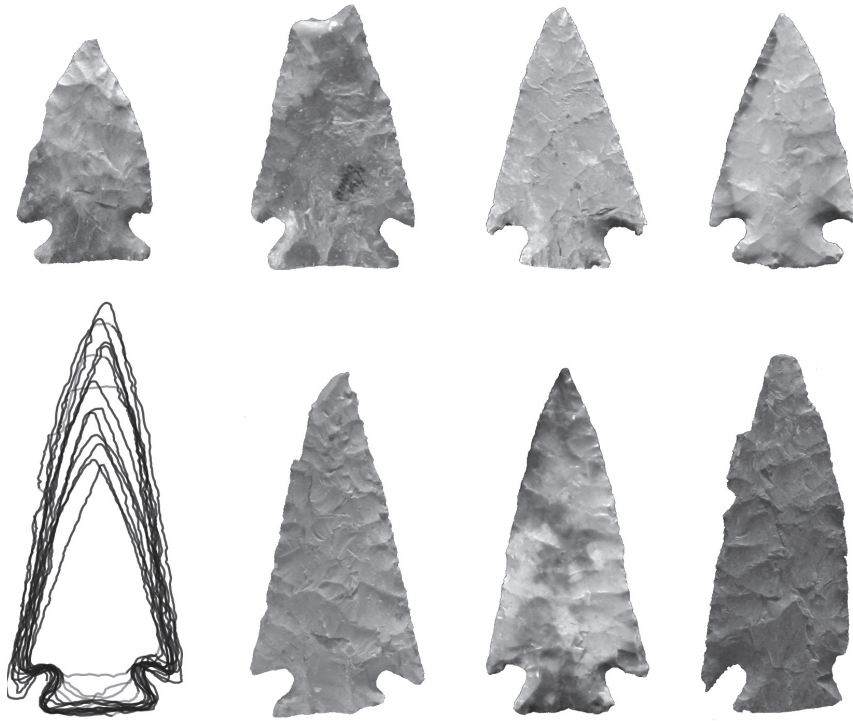


Figure 8. Cassoday points.

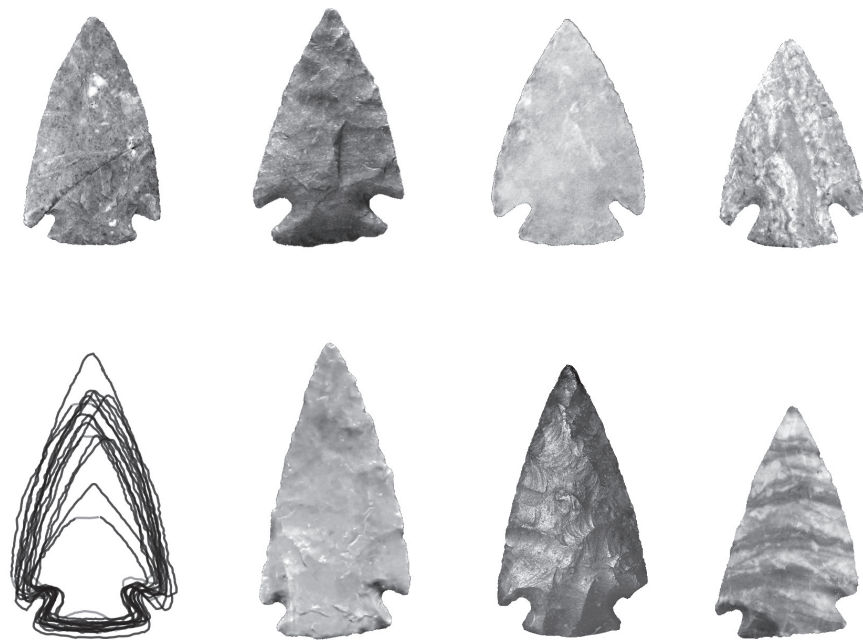


Figure 9. Cimarron points.

with prominent barbs. Stems are short, with straight bases and sharp corners. A few specimens are serrated. Some collectors have been calling these points Pelican Lake, but they are outside the range of variation of that type. Age is suspected to be Late Archaic, 3000–1000 B.C.

CIMARRON (Figure 9)

Named for the river in southwestern Kansas, this is a High Plains point type that is rare farther east. The points are triangular with gently convex blade edges and straight to gently convex bases. They are



Figure 10. Cowley points.



Figure 11. Derby points.

finished with invasive pressure flaking. Narrow corner notches create a short, wide expanding stem. Barbs are well defined with rounded tips. Stem width varies considerably, 10–15 mm. A minority of specimens shares the point outline but has very short notches and stems. Age is probably Middle Woodland.

COWLEY (Figure 10)

Named for the county in southern Kansas, this medium-sized expanding-stemmed point has triangular blades with gently convex edges. Barbs are small when present, and the shoulders are fairly horizontal and concave in shape. They meet the stem in gentle curves. The sides of the stem are also slightly concave, and they meet the straight base in rounded corners. Edge and base grinding are absent. Age is

estimated at A.D. 1–750, based on the presence of apparently identical points in association with Darl and Ensor points in Texas.

DERBY (Figure 11)

Named for the city in southern Kansas, these points have triangular blades with slightly convex sides. Fairly short expanding stems have straight to concave sides, while bases tend to be slightly convex. Shoulders range from straight to out-sloping, the latter creating small barbs. Derby points resemble the Steuben type but with shorter and significantly narrower stems. This point type has been found in both Kansas and Oklahoma. The age has not been determined with any certainty, but it might be similar to that of the Steuben type, which is A.D. 200–600.

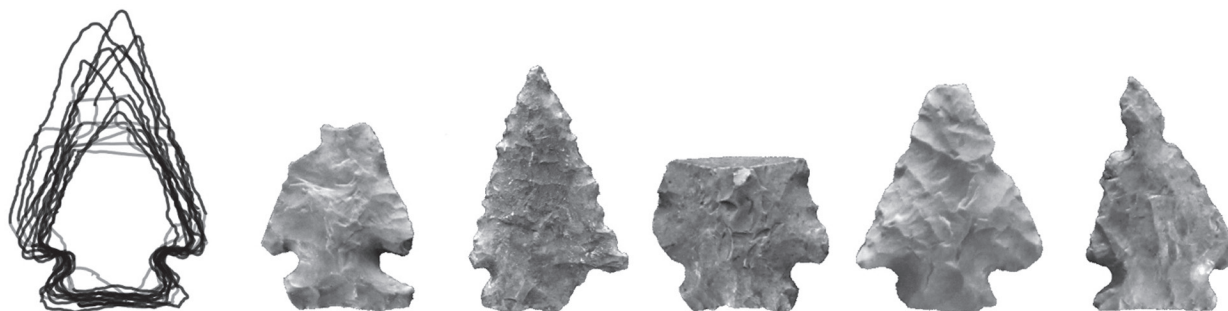


Figure 12. Dexter points.

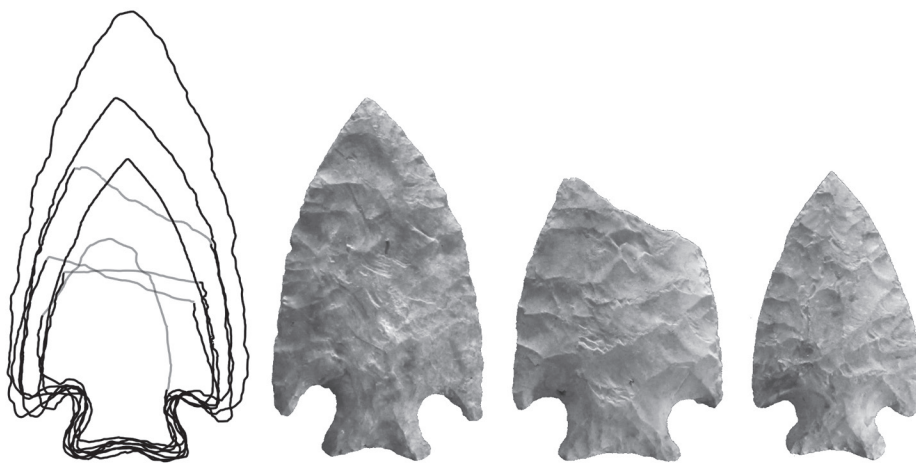


Figure 13. Engle points.

DEXTER (Figure 12)

Named for a small town in the Flint Hills, these are small, short corner-notched points. Both blade edges and bases are fairly straight. A few specimens are serrated. Notches create a base that is narrower than the ends of the blade. The barbs are small and often lost to breakage and resharpening. Stems are quite short. Both the very short stem and the angle of the notch distinguish these points from Kings points, with which they were previously confused. Readers should consult Sandstrom and Ray (2004:22) for a clarification of the definition of that type.

ENGLE (Figure 13)

Engle points are named for the collector who first recognized them as a separate type. So far they have been reported from only central and southern Kansas and central Texas. They are very well flaked points, thin for their width, and finely retouched. Blade edges are convex, and the blades terminate in down-pointing barbs. U-shaped, slightly open cor-

ner notches create short rapidly expanding stems with concave sides and bases. Basal corners are rounded. Bases are ground, and notches are sometimes also ground. The age of this type, based on stratigraphy at the Wilson-Leonard site in Texas, is Early Archaic.

KIRO (Figure 14)

Named for the town in north-central Kansas, this point type is triangular with a long straight-edged blade. Flaking is a combination of unpatterned percussion and pressure flake scars. Shallow corner notches produce a short, very broad stem. Width between the notches averages 23 mm. Bases are straight with rounded corners. So far Kiro has been reported from only north-central Kansas. Its age is unknown.

LARNED (Figure 15)

These arrow points were first noticed in a site in Pawnee County and are named for the county seat.

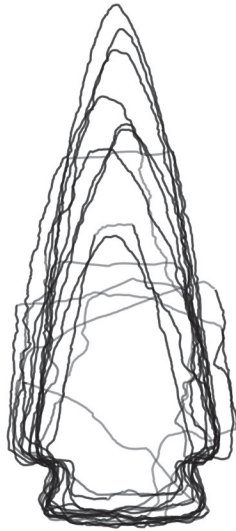


Figure 14. Kiro points.

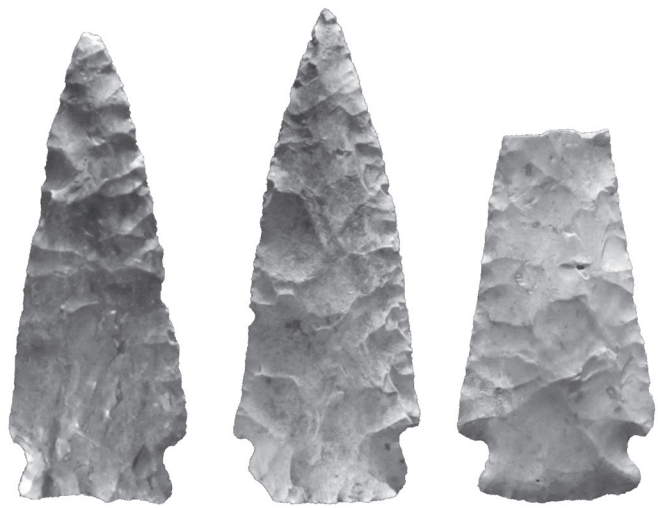


Figure 15. Larned points.

This type appears to be quite rare and restricted in its distribution in both time and space. It is an isosceles triangle in shape with recurved blade edges and a convex-to-straight base. The sides flare out just above the base, which makes the points similar in outline to preforms of the Agee type. However, damage to the tips makes clear that these are finished points. Also unlike Agee points, these specimens are not only unnotched, but the bases are far less convex and are straight on half of the known specimens. Age appears to be very Late Woodland.

LEBO (Figure 16)

Named for a town in the Flint Hills, this type has triangular blades with small barbs on newly made specimens. Blade edges vary from slightly convex to straight. Wide shoulders are horizontal to slightly sloping and meet the stems in fairly abrupt curves. The stems are narrow, straight to slightly contracting, and have straight sides. The bases are straight to slightly convex with fairly sharp corners. The age

is unknown, and so far the reported distribution is from central Kansas to Oklahoma.

LONGTON (Figure 17)

This type is named for the town in southeastern Kansas. It features a slightly expanding stem with an indented base. Blades are lanceolate in shape, and maintenance and repair affect blade length more than blade width. The points are fairly thick and exhibit percussion flake scars with pressure flaking limited to the edges. Although these points bear a resemblance to Duncan and Hanna points, they are larger and often more crudely worked. They also differ from the previously defined indented base points from Texas, such as Gower. Their age and distribution are unknown, given previous confusion with those other types.

MAYETTA (Figure 18)

This type is named for the town in north-central Kansas. The points have long blades with straight to

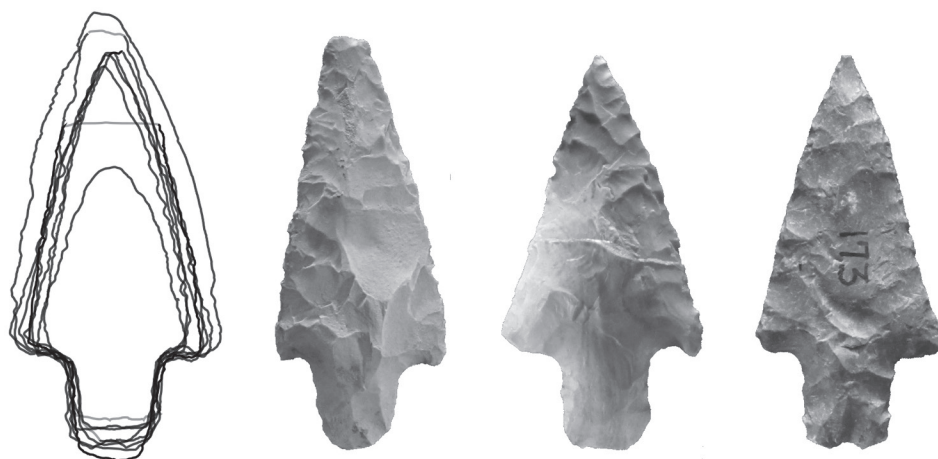


Figure 16. Lebo points.

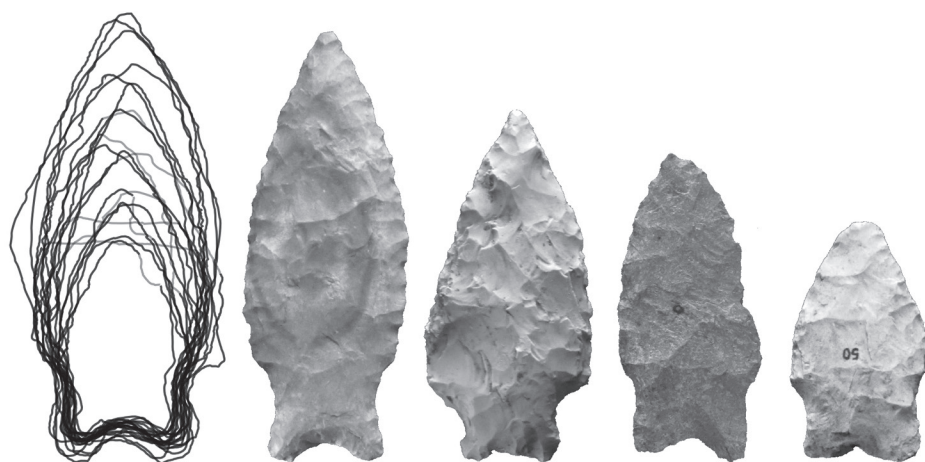


Figure 17. Longton points.

slightly convex edges. Resharpening extends down the entire length of the blade edges, so that the tip angle does not change. Resharpening is bifacial and does not include serration. Relatively narrow corner notches create barbs. The stems are short, and the bases are slightly convex to straight with highly rounded corners. The age and associations of this type are unknown, as most reported specimens have come from gravel bars.

MCCLURE (Figure 19)

This type is named for the family on whose property in Butler County a large, nearly pure assemblage was found. The contracting-stemmed points have triangular blades and broad, nearly horizontal shoulders. Blade edges are nearly straight with a tendency to be slightly recurved, while stem edges are straight to very slightly convex. The truncated

bases are fairly narrow and often concave. This type previously has been confused with the Langtry point, which is thinner and more finely flaked. The McClure point appears to be Early Woodland in age and is associated with oval scrapers, expanded base drills, fairly small but thick ovate bifaces, and boiling stones.

OXFORD (Figure 20)

This type is named for the town in southern Kansas. It has blades that are lanceolate when new but become triangular after resharpening while maintaining convex edges. The blade-shoulder junction is fairly sharp but lacks barbs. Shoulders slope down to slightly contracting stems. Bases are slightly concave to straight with fairly sharp corners. Some bases are thinned, but basal grinding is absent. They appear to date before 3600 B.C., as they were found

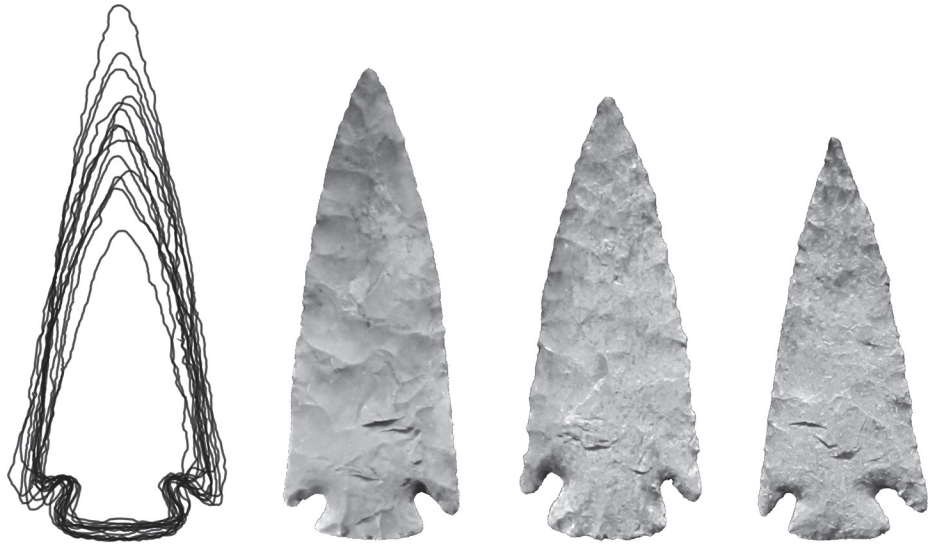


Figure 18. Mayetta points.

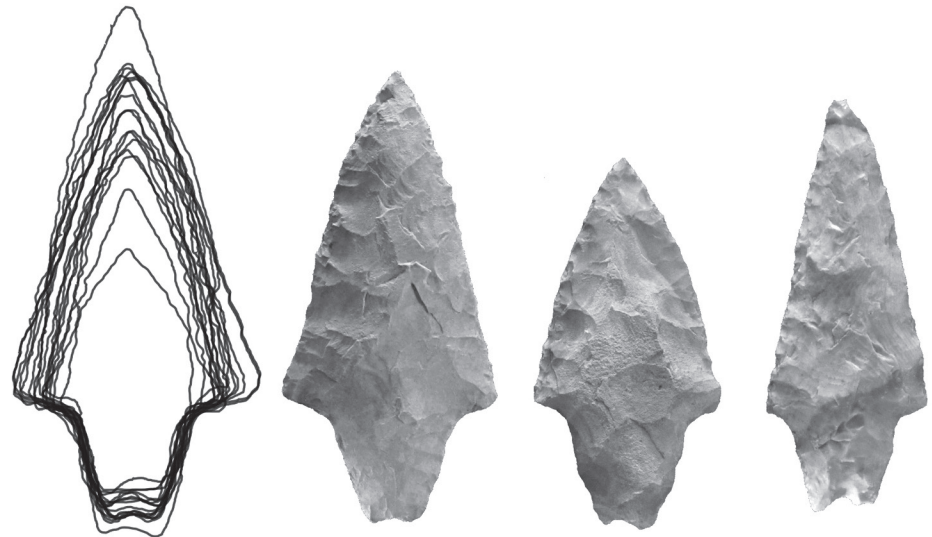


Figure 19. McClure points.



Figure 20. Oxford points.

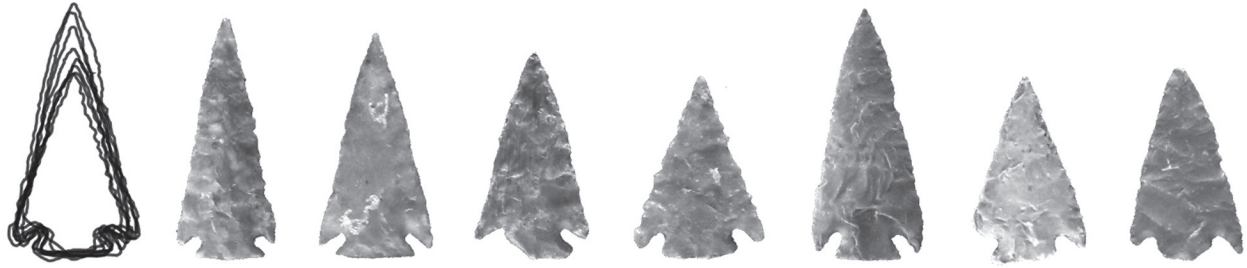


Figure 21. Pfaff points.



Figure 22. Resser points.

below Lamoka and Pantile points at the Snyder site near El Dorado. In that level they were associated with grinding stones, large bifaces, a chopper, and a blade.

PFaff (Figure 21)

Named for the site (14NS319) in which it was first recognized, this arrow point bears a resemblance to Rockwall points from East Texas. The overall shape is the same, with triangular blades and base notches that are angled like corner notches. Both types have fairly straight blade edges and straight to slightly convex bases. A few specimens of each type have serrated blades. The essential difference between the two is that Pfaff points have shorter stems than Rockwalls. In fact, Pfaff points look like Rockwalls in which the lower half to two-thirds of the stem has been flaked away along with the lower portions of the barbs. The result is that Pfaff points tend to be somewhat smaller than Rockwalls with stems that are wide in proportion to their length. Neither age nor distribution is well documented.

RESSER (Figure 22)

Named for Kenny Resser, who first brought this type to the author's attention, it is a thin, triangular point

with basal notches, located just inside the corners. The notches are narrow and parallel sided, oriented like corner notches. The edges of the blades are straight, and the notches create prominent barbs that extend down to the level of the base. The bases are concave with rounded corners. Flaking is a combination of soft-hammer percussion and pressure flaking. Specimens of this type have been found from central and northeastern Kansas into northwestern Missouri. They appear to date after 1800 B.C., as Grosser (1973:Fig. 4i) found one specimen stratigraphically above Lamoka points at the Snyder site. Shippee (1967:Fig. 21d) thought points of this type from the Shields site in Missouri were Late Woodland in age, but the site yielded points that ranged in age from early in the Archaic period through Late Woodland.

SILVERDALE (Figure 23)

Named for a small town in the southern Flint Hills, this type bears a resemblance to Shumla, which is restricted to the Lower Pecos, South Texas, and Northern Mexico. Silverdale points differ in having open U-shaped basal notches that are shorter than the V-shaped notches on Shumla points. Blades are triangular with strongly developed barbs. Blade

Figure 23. Silverdale points.

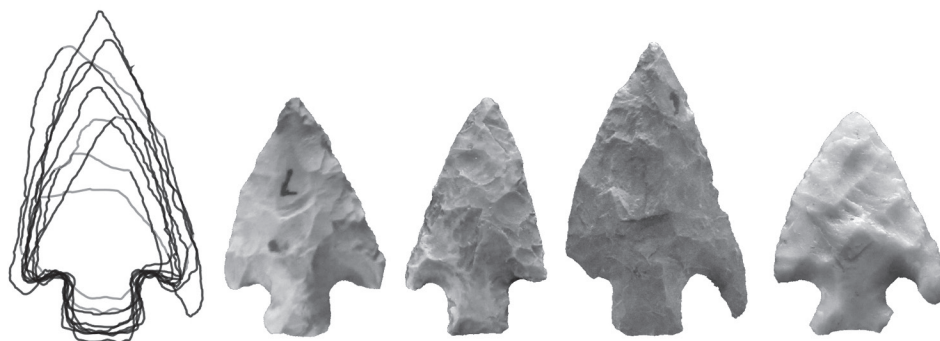
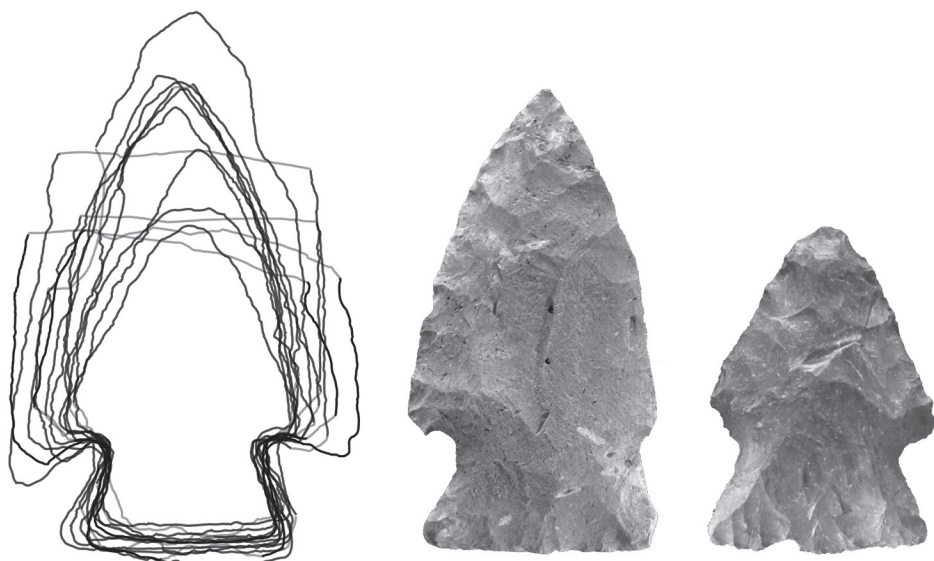


Figure 24. Stauffer points.



edges are straight to somewhat convex. Stems are straight to slightly expanding, and basal shape is variable from straight to strongly convex. The age of these points currently is unknown. They have been found in southern Kansas and northern Oklahoma.

STAUFFER (Figure 24)

Named for the late Dick Stauffer, whose generous donation of his lifetime collection made this study possible. This is a large and thick point that has a triangular blade with convex sides. Corner notches create a rapidly expanding stem with straight to slightly convex sides and a straight base with blunt corners. Neither the base nor the blade edges are ground. These points exhibit percussion flaking, with pressure flaking used only to straighten the edges. The age is unknown but suspected to be late

in the Archaic sequence. So far these points have been seen in collections from the Flint Hills and western Ozarks.

WALNUT VALLEY (Figure 25)

This point type was defined previously by Roger Grosser (1973), but its existence has largely gone unrecognized by collectors. These points look like oversized Scallorn points, but they occurred well below the Late Woodland deposits at the Snyder site near El Dorado. Grosser suggested that Walnut Valley points might reflect early use of the bow and arrow, but the width between the notches is too great for an arrow shaft. It is more likely that they were mounted on wooden foreshafts for use with atlatl and dart.

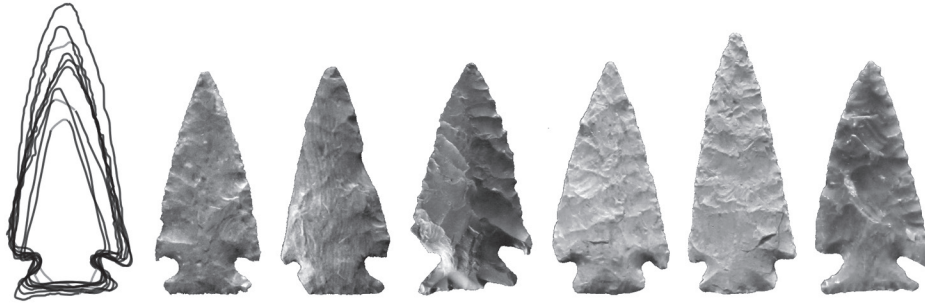


Figure 25. Walnut Valley points.

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COLTRAIN BIFACE CACHE FROM WILSON COUNTY, KANSAS

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A collection of seven bifacial artifacts made from Osagean chert was found at one time in a cultivated field on a terrace of Chetopa Creek in Wilson County, southeastern Kansas. This paper provides a description of the bifaces and information about the context of the find. The bifaces are interpreted to be of Archaic or Woodland age.

CACHE SITE AND DISCOVERY CONTEXT

The seven bifaces in this cache were found at one time in a very small area, less than a meter in extent, in a cultivated field (site 14WN403). The discovery location is on a terrace of Chetopa Creek in Wilson County in southeastern Kansas (Figure 1). This terrace of Chetopa Creek has multiple archeological sites in the general vicinity, within a kilometer of the cache location. The area where the cache was found has yielded Archaic dart points and no pottery, according to the cache discoverer. On a visit to the find spot with the discoverer of the cache, the authors saw pieces of fire-cracked rock and chipped stone flakes but no diagnostic lithic or ceramic artifacts. A previously recorded site that has yielded ceramics is located about 100 m south of the cache find spot.

The bifaces were found in a cluster and apparently had been exposed as the result of erosion and plowing of the field. The small area of the cluster suggests that the bifaces had been placed in a small pit and were exposed only a short time prior to discovery. None of the bifaces are broken, but one has a small nick and another has some iron (metal tool) stains that are characteristic of farm implement damage. A variety of notched and stemmed dart points have been collected from the area where the cache was found. The field was fallow for many years prior to 1960 at which time the field was not cultivated, according to the field notes of an avo-

cational archeologist who collected artifacts from nearby sites. The cache was found during the 1970s, during which time deep plowing was common and relatively new. Prior to the 1960s plowing depths tended to be quite shallow and this may explain why the cache had not been exposed previously. Silt build up on the terrace surface probably continued intermittently in the late Holocene, but with rapid erosion of the cultivated terrace surface during the historic period following Euro-American settlement (Mandel 2006). No archeological testing or stratigraphic study has been made of the cache site area.

DESCRIPTION OF THE BIFACES

All seven bifaces are manufactured from the same lithic material which may be Burlington chert. The nearest sources for Burlington are in southeast Missouri, some 100 to 150 km east and southeast of the find site (Ray 2007:200, Fig. 8.23). Other Ozark area cherts have characteristics that are closely comparable to Burlington, including some Keokuk and (upper) Reid Springs formation cherts from northeastern Oklahoma and elsewhere (Ray 2007, 2013). Following Ray's (2013:32–34) suggestion, material in this biface cache is referred to as undifferentiated Osagean chert. All bifaces are complete, none exhibits cortex, and only Biface 1 shows evidence of heat treatment. All of the bifaces appear to have been finished with soft hammer (perhaps antler or wood) percussion flaking, and minimal to

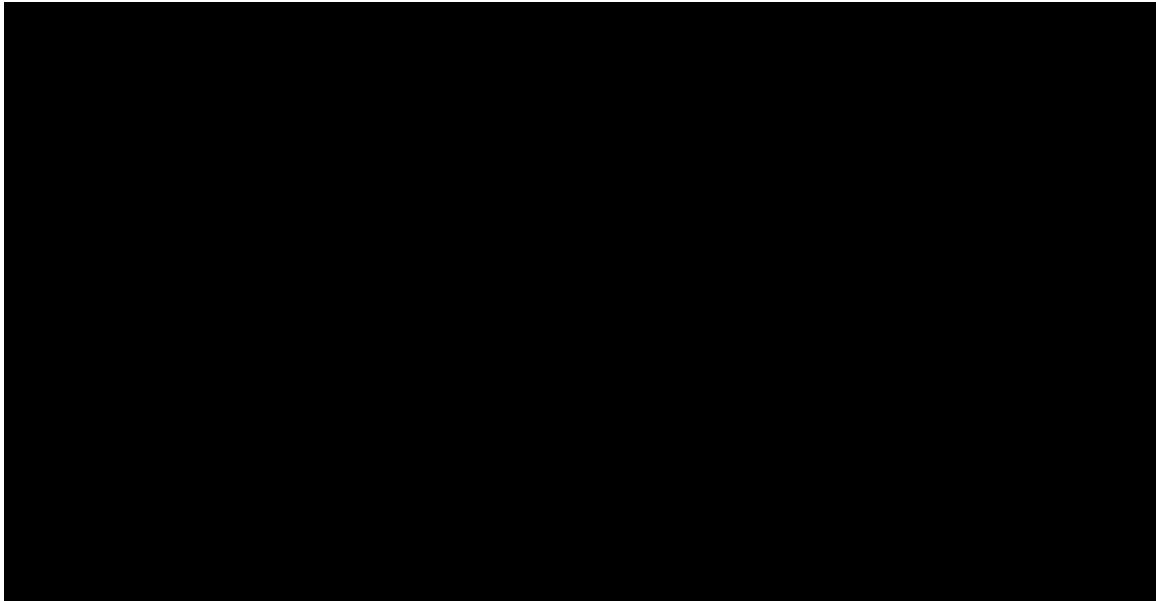


Figure 1. General location of the Coltrain cache find spot.

no patterned edge trimming is present. No pressure flaking is evident on the biface margins.

The shapes or outlines of the bifaces vary from sub-rectangular (Biface 4), to ovate (Bifaces 1, 2, 3, 5), to leaf-shaped (Bifaces 6 and 7). Metric information on each biface is provided in Table 1, and images of each face are provided in Figures 2 and 3. The mean or average length, width, and thickness of the bifaces are 10.6, 5.1, and 1.3 cm, respectively. The average weight is 74 grams. The width to thickness ratio for the group is just under 4:1. These are relatively thin and well-made bifaces.

None of the bifaces has been notched, and the flaking is well executed with rare hinge or step terminations. Most flake scars show that thin expanding flakes were removed, which typically carry to or just across the midlines of the bifaces. These artifacts have not been inspected microscopically, but none exhibits high polish or wear on the flake scar ridges. This suggests that they were not transported a long distance while loose or rubbing against one another in a bag. Perhaps they were individually wrapped for transport, or final flaking may have occurred after transport. Edge modification appears to be the result of manufacturing and edge platform preparation or from dulling of edges for transport, rather than from use wear.

Biface 1 is the only specimen with evidence of

intentional thermal alteration. It is pink to reddened over most of both faces with the exception of the tip. The evenness of this coloration and lack of fractures suggest that the piece was intentionally heat treated rather than accidentally burned. A few flake scars exhibit high luster, indicating that some flake removals were made after the piece was heat treated. None of the other bifaces exhibits this intense color change, but Bifaces 3 and 5 have minimal pink color alteration on parts of their margins. Biface 1 may have been made from a large flake. A remnant of the original ventral surface of the flake blank may be present near the tip of the biface. Irregularities or concavities on the margins of this biface appear to be the result of percussion blows that were slightly misapplied and collapsed or removed too much of the biface's margin.

Biface 2 is symmetrically ovate with a couple of small edge irregularities. Both of these correspond with hinge terminations. Biface 2 also has a small area of weathered surface on one face. This probably represents the surface of a crack or flaw in the original block of flint, which became stained with iron oxide, rather than an area of exterior cortex. This biface is thinnest in relation to its width of all the cache pieces (4.7 times wider than it is thick).

Biface 3 is the smallest of the group. It is thin and has symmetrical lateral margins but with blunted or



Figure 2. Obverse of the cache bifaces.

squared ends. A small V-shaped nick in the margin of this biface may reflect damage from the metal blade of farm tillage equipment.

Biface 4 is a long and narrow parallel-sided biface with bluntly rounded ends. Trimming on one end of this relatively thick biface is reminiscent of that found on Dalton adzes, but there is no evidence that this piece was so used.

Biface 5 is an elongated oval form and is the longest of the bifaces found in this group. A prominent ridge on one face presented a problem for the knapper. Attempts to thin the ridge from the biface margins and both ends were only partially successful. These attempts resulted in hinge terminations for flakes removed from each end of the biface. Biface 5 also shows metal tool stains on the same face as the ridge, indicating that it was hit with modern cultivation equipment. This may have happened at the time the cache was exposed.

Biface 6 is leaf shaped with moderate corners and a short “basal” portion on the broad end. Like the other bifaces, this specimen is well shaped and

exhibits mostly thin expanding flake scars with feathered terminations. Flake scars extend to or past the midline of the biface.

Biface 7 is similar in form to Biface 6 with distinct shoulders and a short base on the broader end. This biface exhibits some very large expanding flake scars. Like Biface 6, this specimen has one pointed and one broad rounded end with symmetrical slightly convex lateral margins.

COMMENTS AND COMPARISONS

This small collection of bifaces exhibits a very consistent pattern of flaking and stone working detail. It is likely that all were made by one individual. The purpose of the cache is unknown. The artifacts were not expended, and none appears to have been made into a finished tool or to have been used as a tool in its current form. The size and form of these bifaces would make them well suited to the manufacture of large dart points or knives, which were common during the Woodland and Archaic period in the re-



Figure 2. Reverse of the cache bifaces.

Table 1. Metric Information on Coltrain Bifaces.

Biface Number	Length (cm)	Width (cm)	Thickness (cm)	Weight (gm)	Width/ Thickness
1	10.366	5.198	1.339	77.8	3.882
2	10.464	5.453	1.157	77.8	4.713
3	9.208	4.644	1.123	48.6	4.135
4	11.616	4.583	1.298	86.1	3.530
5	12.037	5.261	1.557	89.4	3.378
6	10.550	5.445	1.311	76.7	4.153
7	10.016	5.221	1.265	63.7	4.127
Means	10.608	5.115	1.292	74.3	3.988

gion. The size is adequate for making Paleoindian projectile points, but heat treatment of bifaces was not practiced during the Paleoindian period (before Dalton time) in this region, as far as is currently known. Ray (2007:196–199) provides a helpful discussion of the chronological variation in heat treatment of Burlington chert (one of the Osagean cherts), which apparently was most common during

the Middle Archaic and Middle Woodland periods in Missouri and northeastern Oklahoma. Flaking patterns on these bifaces is not indicative of any specific Paleoindian projectile point type. Heat treatment of bifaces was quite common during the Woodland period but also occurs throughout much of the post-Dalton Archaic period.

A variety of Archaic stemmed and notched dart

points (projectile point knives) have been found in this general location, but Woodland-age dart points also have been found. At present there is no compelling reason to assign this cache to a specific archaeological cultural complex. Biface caches during the Middle Woodland period are commonly entirely heat treated, whereas Archaic caches are less consistently so. At present, however, assignment of this cache to either the Archaic or Woodland period would be little more than a guess.

ACKNOWLEDGMENTS

We thank our friends and supporters in the Wilson County, Kansas, area for their thoughtful and continuing help in documenting the region's archaeological record. The name of the discoverer of this cache is not provided here for reasons of privacy and site protection. Thanks to Jack Ray for his observations and helpful comments.

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A PREHISTORIC PIPESTONE TOOL USED FOR DENTATE-STAMPING ON POTTERY

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A well-made pipestone tool found in a Kansas Flint Hills creek bed is determined to have been used to create stamped decoration on pottery. This type of decoration is typical of Kansas City Hopewell and Cuesta pottery types in Kansas, dating 1–650 C.E. The source of the pipestone used to make the implement is the glacial deposits of northeast Kansas.

The Kansas Archeology Training Program (KATP) field school was held in Morris County in 2006 (Dougherty 2012). The focus of investigation was 14MO403, a site recorded by Dick Stauffer and Brendy Alison. The site collection, curated at Wichita State University, reflects an Archaic component, as well as Early and Middle Ceramic components. Some of the ceramic sherds at 14MO403 are decorated with what Stauffer referred to as a roulette design, an old term for what is now usually called dentate-stamped or rocker-stamped.

THE PIPESTONE TOOL

During the 2006 KATP field school, Malcolm Strom of Dwight, Kansas, showed his artifact collection from Morris County to archeologists working at 14MO403. An item made of pipestone stood out among the rest (Figure 1). On June 27, 2016, Mr. Strom gave the following account of his discovery.

I probably was seven or eight years old (1925–1926) when I found this strange-looking object. I was in the dry flinty bottom of the creek looking for fossils. When I saw the object, I was perhaps 50 or 75 feet beyond the property fence to the west.

The tool (Figure 1) was recorded as an isolated find and assigned trinomial 14MO431. A 2016 survey of the streambed and surrounding terraces in the vicinity of the find spot yielded no other prehistoric material.

The implement is made of a red pipestone. It is 154 mm long and 24 mm wide at its widest point. The long axis is flattened top and bottom, one end tapers to a dull point, and the other end terminates in an expanded head with a serrated margin. The surface is smooth, with fine striations extending the length of the specimen. Except for a small chip at the end of the dull point, the piece is undamaged.

This artifact is, to the authors' knowledge, unique and has properties that do not match the functional attributes needed to carry out everyday tasks, such as cutting, piercing, pounding, grinding, or drilling. Also, pipestone typically is fashioned into pipes, bannerstones, and items of personal adornment, such as beads and pendants. So what was this object used for? One possibility is that it was employed to decorate pottery. Specifically, it may have been used to create the dentate-stamping seen on Cuesta and Kansas City Hopewell pottery in Kansas and surrounding states.

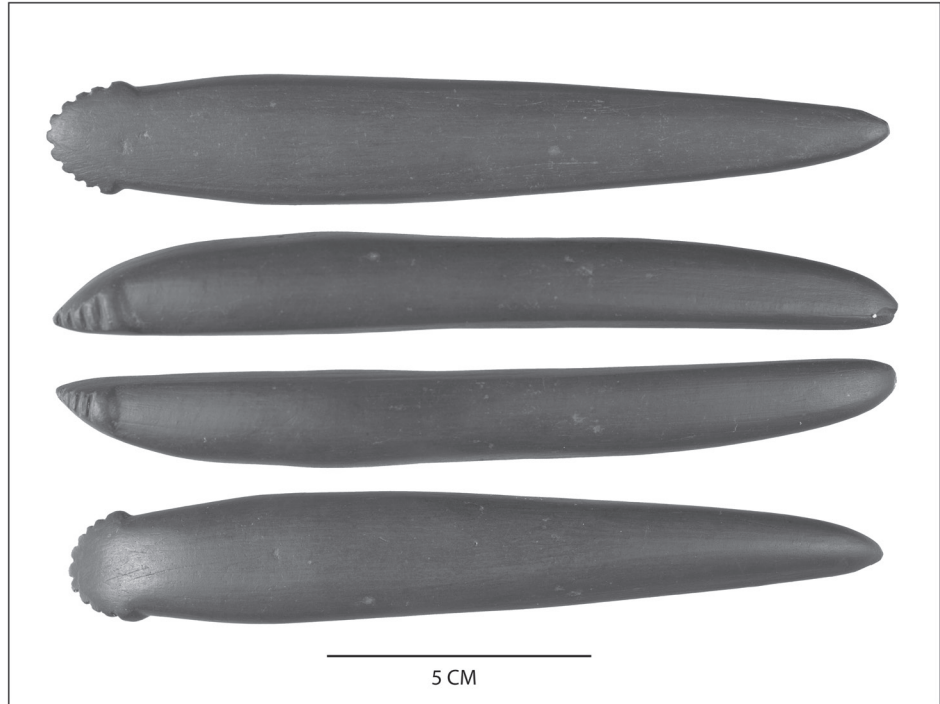


Figure 1. Pipestone tool.

A BRIEF AND INCOMPLETE HISTORY OF DENTATE STAMPED POTTERY DECORATION IN CENTRAL NORTH AMERICA

Prehistoric potters decorated their pots in several ways. One technique is stamping—repeatedly pressing a tool into the still-moist clay to make decorative impressions. In a classic study Griffin (1952) described Havana and Hopewell pottery types in Illinois. Among these types are roulette decorated, stamped, or dentate-stamped. Dentate-stamped refers to stamping created by using an instrument that has teeth, like a gear, leaving a series of impressions in the clay. Frequently the process is repeated, producing rows of impressed designs. The stamped designs often are vertical along rims or are horizontal, vertical, or in a zig-zag rocker-applied pattern on vessel bodies, often within smoothed delineated areas referred to as zones (Figure 2). Griffin (1952:104, 110) differentiated between straight and curved dentate-stamping and noted that some stamping may have been done using a toothed wheel.

In Kansas dentate-stamped decoration on prehistoric pottery is found primarily in the eastern half of the state, though occasionally such sherds are found in High Plains sites. These pottery styles are referred to as Kansas City Hopewell in the northeast part of the state and as Cuesta phase in the southeast (Figure 3). Kansas City Hopewell pottery was first described by Wedel (1943:197–208), who noted its similarity to roughly coeval pottery near Hopewell, Ohio, and Havana, Illinois, and was further described by Johnson (1975). The Cuesta phase initially was defined by Marshall (1972:225–230) and later expanded upon by Witty (1999:171), who mapped its distribution in southeast Kansas as far northwest as Chase County near the origins of the Elk, Fall, and Verdigris rivers.

Johnson and Johnson (1975) used statistical analysis to compare and sort Kansas City Hopewell pottery decorations in relation to those found in the Illinois River valley and declared the Kansas City types to be temporally relevant. Johnson (2001) proposed three phases—Trowbridge, Kansas City, and Edwardsville—based on specific decorative attributes. Dentate-stamping is a key attribute

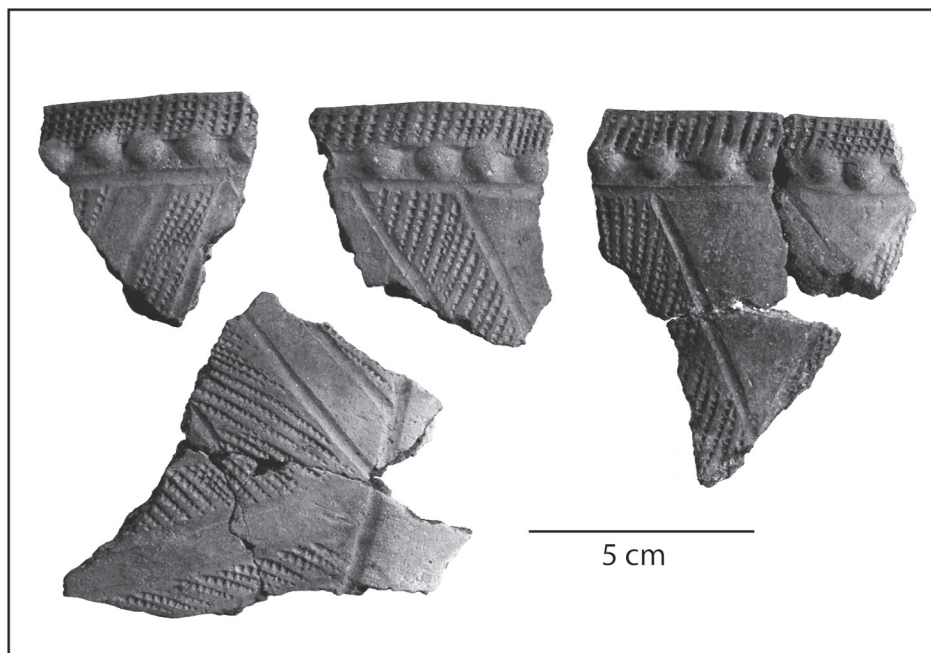


Figure 2. Examples of dentate-stamped pottery from 14LN344.

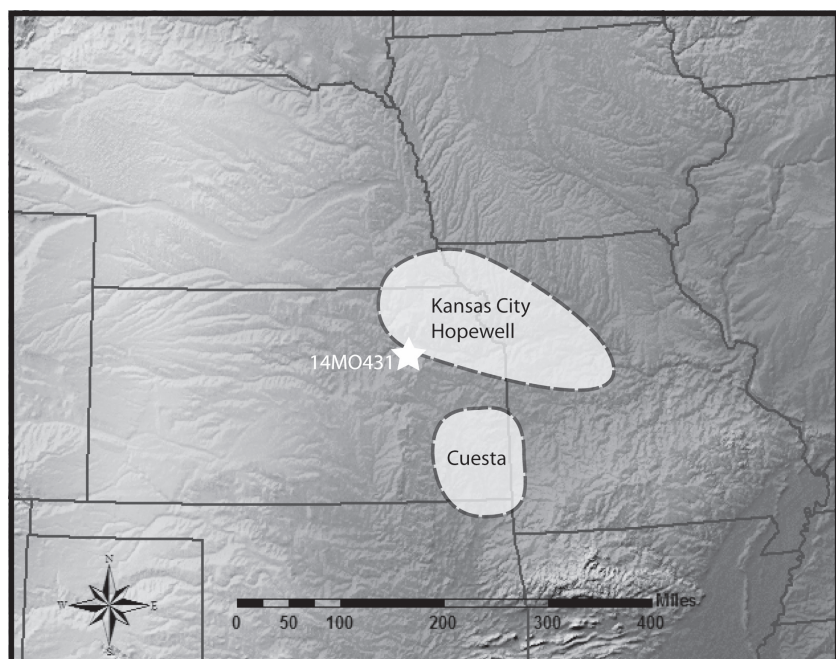


Figure 3. Map showing the distribution of Kansas City Hopewell and Cuesta phase pottery.

of the Trowbridge phase (1–250 C.E.) (Johnson 2001:161).

EVALUATION OF THE PIPESTONE TOOL

What did potters use to create stamping? There are many possibilities—a carved piece of bone, wood,

or shell would serve well. On the other hand dentate-stamped pottery is among the most elaborately decorated pottery found in the Midwest and Plains. The potters making it were skilled and likely took pride in their work. They might have had a set of tools for pottery making, which might have included an instrument for making decorations.

The 14MO431 pipestone tool was used to make

impressions on unprocessed shale clay. This experiment demonstrated that the object can create straight or curved rocker-stamping with a dentate pattern. While the dentate-stamping varies on Early Ceramic pottery, the replicated pattern fits within the range of variation (Figure 4). In short, it is possible and perhaps likely that the tool could have been or was used to dentate-stamp prehistoric pottery.

This is not the first time that an experiment of this type has been done. In 1892 W. H. Holmes described a rouletted or rocker-stamped ware associated with South Appalachian sites, now referred to as Hopewellian. Holmes surmised that tools to make these designs may have started as straight stamps, evolved into handled forms with curved stamp ends, and ended as wheels mounted on handles. He demonstrated the utility of the latter by mounting a toothed cardboard wheel on a handle, dipping the edge in ink, and rolling it over paper, leaving a decoration similar to the aboriginal decorations he was studying (Holmes 1892:150–151). However, Holmes never found an aboriginal object of this type, but in 1940 Wedel and Trowbridge (1940:581–586) reported just such a specimen from the Trowbridge site (14WY1) in Kansas City, Kansas. The piece (HMT Cat. No. 1894) was made from a deer antler and was notched in a gear-like fashion.

Wedel and Trowbridge used the wheel to recreate typical dentate-rocker designs comparable to those found at the nearby Trowbridge site.

Finally, the 14MO431 tool is made of a blood-red claystone, often referred to as pipestone. Pipestone was widely used in the late prehistoric period to make smoking pipes, as well as other artifacts. A variety frequently referred to as Catlinite comes from a specific geological source that today is known as Pipestone National Monument in southwestern Minnesota (Figure 5). Following Hadley (2015:59), the authors refer to this material as Minnesota pipestone. Other geological sources of red pipestone that occur in Wisconsin, South Dakota, Missouri, and Kansas were used prehistorically to make pipes. Archeologists evaluate the distribution of these relatively rare and desirable materials to determine patterns of trade among groups or population movements. To do this, instrumentation is employed to accurately measure distinguishing chemical or mineralogical compositions of materials to determine their geologic sources and thus trace their transport by people. For pipestone the methods used to date include X-ray diffraction (Gunderson 1987, 1991, 2002) and near infrared-reflectance spectroscopy (Emerson et al. 2003, 2013; Hadley 2014, 2015; Hauff et al. 1990; Wisseman et al. 2002, 2010,

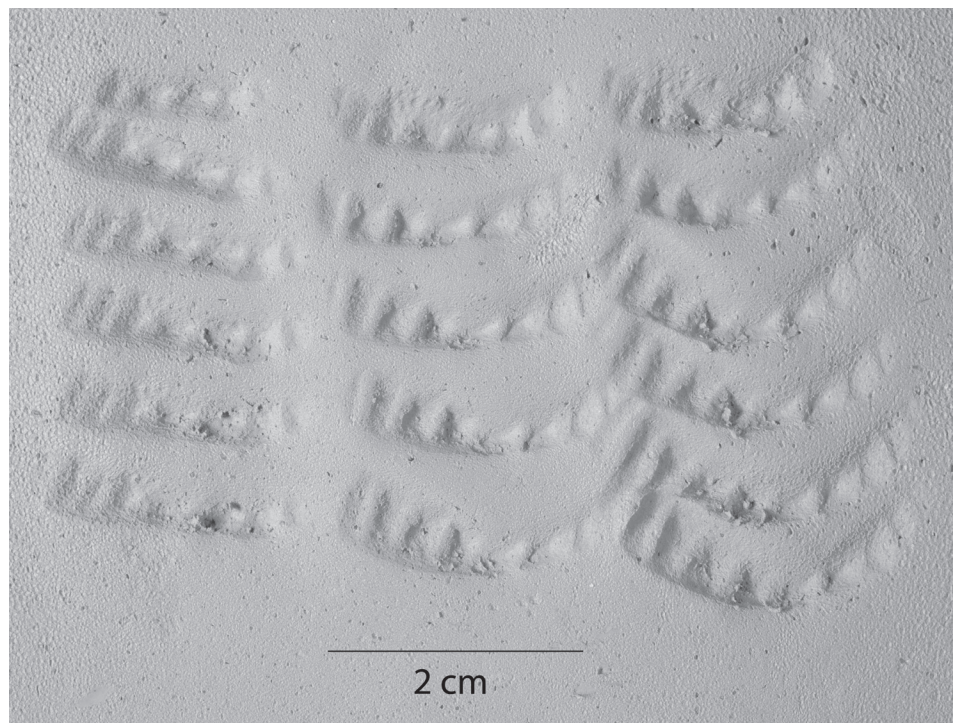


Figure 4. Impressions on clay, made with the pipestone tool.

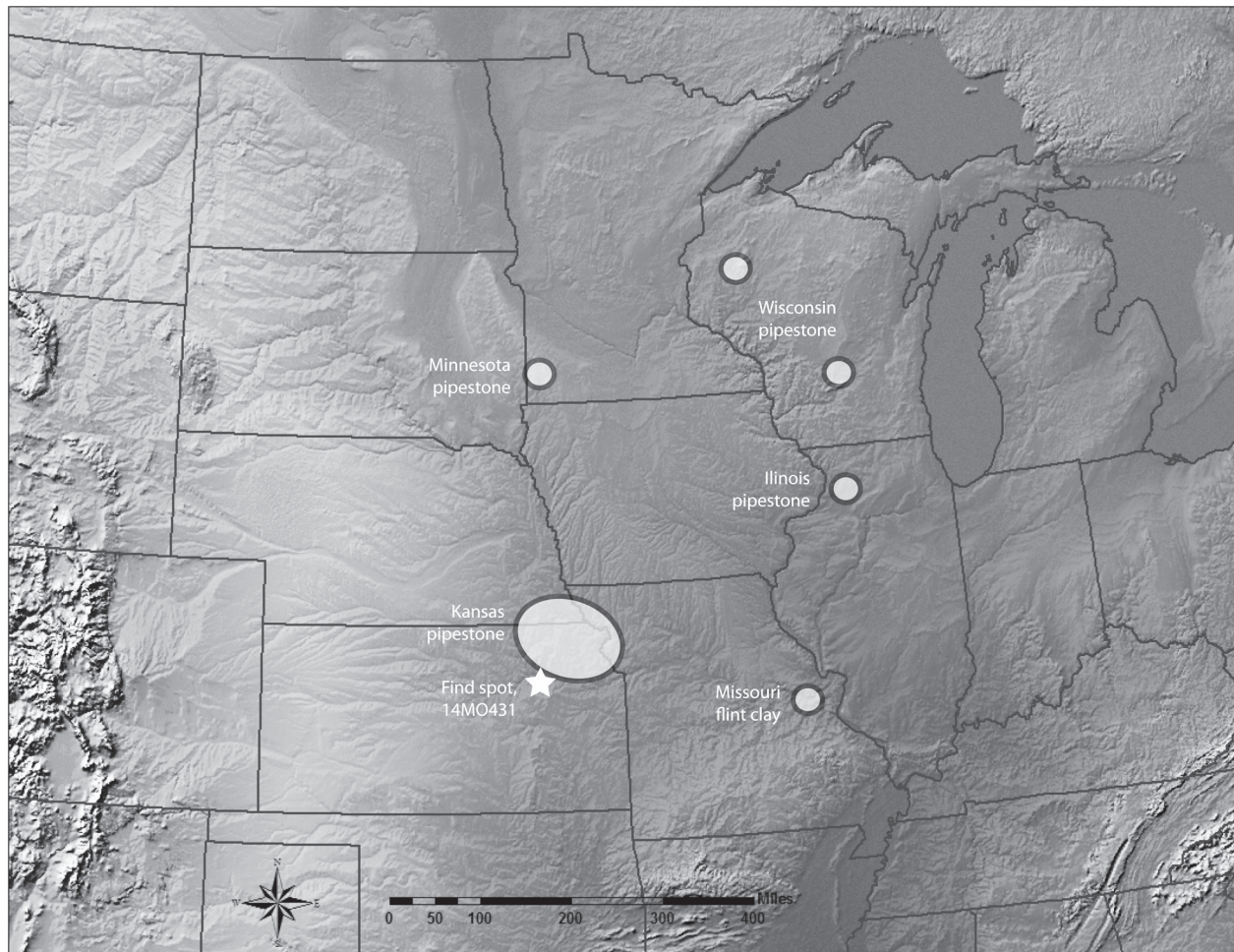


Figure 5. Map of pipestone sources.

2012). Also, Hughes et al. (1998) used X-ray fluorescence as a method supplemental to petrographic thin section analysis, X-ray diffraction, Mössbauer spectroscopy, and scanning electron microscopy/energy dispersive X-ray analyses.

Over the past several years mineralogical analyses, such as non-destructive portable near infrared-reflectance spectroscopy and destructive laboratory-based X-ray diffraction (see references above), have been widely used to link Hopewell and Mississippian culture artifacts to their geological sources. Given that mineralogical differences readily can discriminate among the different known sources, it is anticipated that a non-destructive elemental analysis, such as X-ray fluorescence, likewise could be used to measure chemical composition and thus determine the geological source of the stone used to make the stamping tool. Geological specimens of Kansas

and Minnesota pipestone were obtained from the National Park Service Midwest Archeological Center and the Kansas Historical Society. The chemical composition of the 14MO403 piece was measured by X-ray fluorescence and compared to the measured values of 10 geological samples of Kansas pipestone and 12 geological samples from the Minnesota pipestone source area. Values obtained for thorium and yttrium (Figure 6) and niobium and iron (Figure 7) provide preliminary but strong evidence that the item is made of Kansas pipestone, the source area closest to its find spot (Figure 5). Hadley's (2014, 2015) analysis of pipestone artifacts from Kansas demonstrated that pipestone use is much more prevalent after 1400 C.E. and that Kansas pipestone is much more prevalent than Minnesota pipestone in Kansas sites during all periods of use. This source determination is consistent with that trend.

Figure 6. Thorium and yttrium plot showing XRF data generated for Kansas and Minnesota geological samples and the 14MO431 pipestone tool.

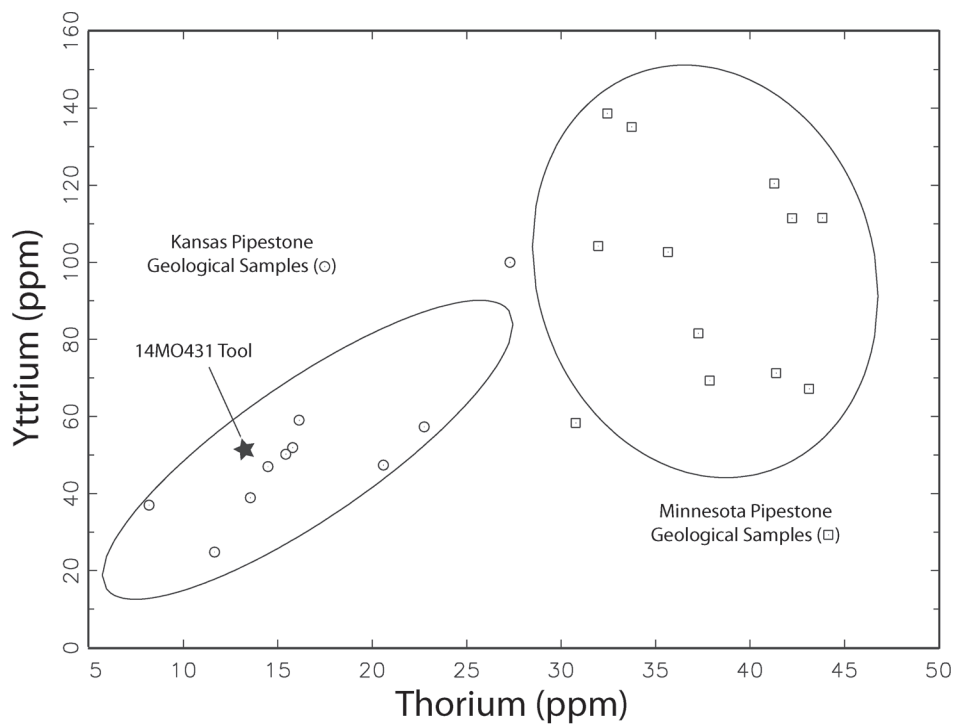
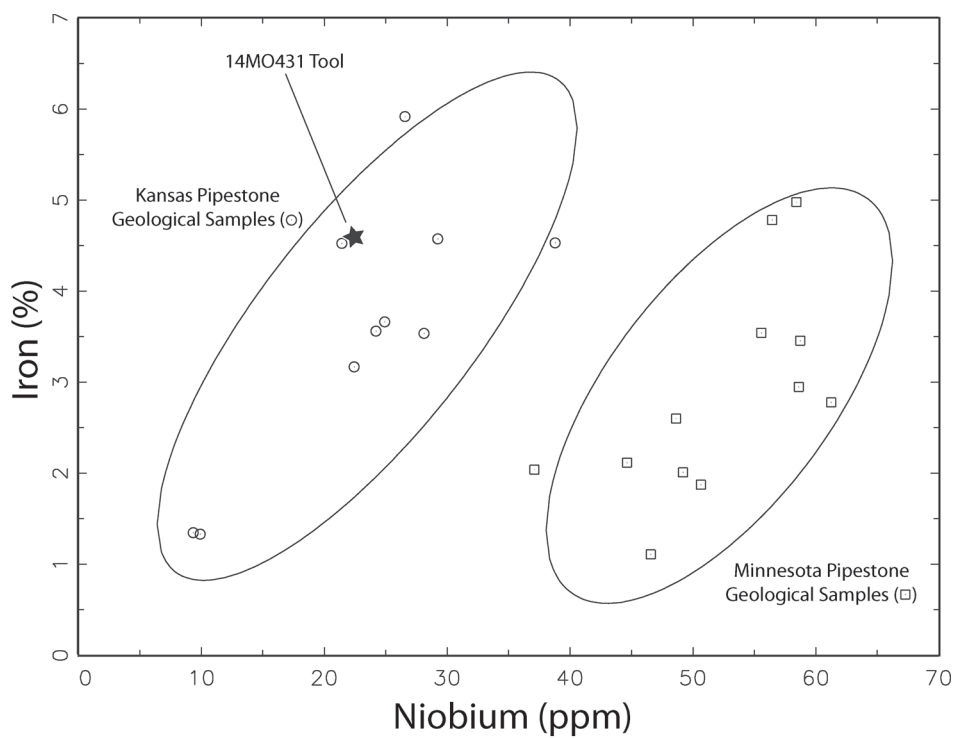


Figure 7. Niobium and iron plot showing XRF data generated for Kansas and Minnesota geological samples and the 14MO431 pipestone tool.



CONCLUSIONS

Dentate-stamped pottery is found in large areas of the Midwest, including eastern Kansas, into the Flint Hills, and occasionally on the High Plains. It is some of the earliest pottery in Kansas, while also being arguably the most elaborately decorated. Malcolm Strom's discovery of a Kansas pipestone implement offers a unique glimpse into the life of a potter nearly two millennia in the past. While an expedient tool could be readily made to produce the dentate-stamping seen on Havana-Hopewell decorated pottery, Strom's artifact shows that one Kansas potter took his/her work seriously, so much so that he/she made, or had made, a fine, attractive, versatile tool, crafted from a scarce and highly sought material from a local source, as close as 50 km from the find spot. This is one of very few Early Ceramic pipestone objects in Kansas for which a geological source has been determined.

While pottery is functional, used for cooking, serving, or storage, pottery decoration had a social role. While only speculation, that role could point to group identity, beliefs in the spiritual realm, or an aesthetic sensibility. Regardless, this handsome artifact facilitates greater affinity to a person in the past.

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NEW EXCAVATIONS IN SCOTT STATE PARK: PRELIMINARY FINDINGS FROM 14SC409

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University of Iowa

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Since 2013, researchers from the University of Iowa and University of Oklahoma have been investigating site 14SC409, located in Lake Scott Park, Scott County, Kansas. Originally tested in 2009 by the Kansas Archeology Training Program, site 14SC409 has yielded important information on the occupation of the region by Dismal River aspect (Plains Apache) groups and how this occupation was related to the nearby Scott County Pueblo (14SC1). Although new excavations at the site are planned, the authors have completed the analysis of existing artifact collections, and this paper summarizes these results and our preliminary findings regarding the nature and identity of the site's occupants.

In the summers of 2013, 2014, and 2015, University of Iowa (UI) and University of Oklahoma (OU) faculty and students conducted archeological investigations at a Protohistoric (A.D. 1400–1750) Dismal River aspect site (14SC409) in Scott State Park, Scott County, Kansas. This work was part of a long-term project that explores the nature of Dismal River occupation on the High Plains. The 2013 field season focused on relocating and expanding the excavation area from the 2009 Kansas Archeology Training Program (KATP) investigations. The 2014 field season concentrated on investigating features identified in the 2009 and 2013 excavations but ended early, following the discovery of a human burial at the site. The 2015 field season largely focused on investigating the surface artifact expression of the site.

This paper summarizes the results of the UI 2013–2015 work at 14SC409 and the analyses of artifacts collected from this site. While investigations of this rather large site are not finished, the discovery of the human burial did require rethinking the investigations and summarizing the findings to date. Therefore, the authors present the results from the site, although these findings likely will change

as future work progresses. The analyses of ceramics, lithics, and faunal remains, as well as the limited data collected on burial practices present at the site have provided significant insights into the identity of the people who lived and died at 14SC409 and the role that they may have played in the larger community of Dismal River farmers living in the region (Trabert and Hill herein). People occupied this site during a time when they likely were experiencing profound social, demographic, and economic changes, and data from this site has much to contribute to better understanding of the occupation of the High Plains during the Protohistoric period.

CULTURAL-HISTORICAL SETTINGS

The High Plains of western Kansas have been occupied for at least 11,500 years (Blackmar and Hofman 2006; Hoard 2009). Early Archaic (Logan Creek), Late Archaic, Early Ceramic (Plains Woodland), Middle Ceramic (Upper Republican), Late Ceramic (Dismal River), and Historic Euroamerican sites have all been identified in Scott State Park (Hoard 2009). The focus of this report is on the Late Ceramic period in Scott County, Kansas.

The Dismal River aspect is an archeological complex that includes sites in western Kansas, western Nebraska, eastern Colorado, and south-eastern Wyoming (Trabert 2015). This group occupied the High Plains from approximately A.D. 1400–1750 (Gilmore and Larmore 2012; Scheiber 2006). Dismal River peoples in the western Plains lived in short-term rockshelter and open camp sites and maintained a principally hunting and foraging lifeway (Brunswick 1995; Cassells 1997; Gunnerson 1960). In contrast Dismal River peoples in the eastern Plains often lived in larger five-post wickiup-like structures, used outdoor baking pits, and relied on horticulture in addition to their hunting and gathering (Champe 1949; Gunnerson 1960, Hill and Metcalf 1942; Wedel 1959).

The Dismal River occupation around Lake Scott is quite extensive. At least 17 sites contain ceramic assemblages with diagnostic Dismal River ceramics, and 2 additional sites probably are associated with the Dismal River complex because either they have small assemblages of sherds similar to Dismal River types or are thought to be contemporaneous with nearby Dismal River sites (Hoard 2009). A number of Dismal River sites in Scott County have evidence for the use of masonry structures (14SC1), wickiup style structures (14SC1, 14SC106, 14SC304), baking pits (14SC1, 14SC301, 14SC320, 14SC325), and human burial (14SC301, 14SC409) (Gunnerson 1987; Wedel 1959; Witty 1973, 1985). The remaining sites likely represent either shorter term campsites (14SC104 and 14SC302) or ephemeral artifact scatters (14SC5, 14SC105, 14SC107, 14SC316, 14SC317, 14SC320, 14SC403, 14SC427, 14SC434, and 14SC450). The density of Dismal River sites in and around Lake Scott is greater than in any other part of the Central Plains (Trabert 2015). Hoard (2009) suggested that the unique geological features around the park made the area very attractive to Dismal River occupants.

Dismal River groups, like those living in western Kansas, are thought to be Athapaskan-speakers and affiliated with later Apachean communities. Although some scholars disagree with this assessment (see Opler 1982 and Gulley 2000 for alternatives), most cite similarities in mobility, architectural styles, tool types, use of outdoor baking pits, mortuary customs, general geographic location, and chronology between Dismal River and later Apache

groups support the cultural connection (Brunswick 1995; Gunnerson 1960, 1968, 1987; Schlesier 1972; Trabert 2014; Trabert and Hill herein; Wedel 1959). Many Athapaskan groups (notably the Navajo and Jicarilla Apache) also maintained close ties with indigenous groups in the American Southwest (Anderson 1999; Eiselt 2012; Kulisheck 2010), another point of commonality with Dismal River.

Dismal River peoples were participants in broader social and exchange networks that connected them with neighboring Plains groups, such as Great Bend aspect and possibly Middle Missouri tradition groups, and with Puebloan peoples living along the Rio Grande River in northern New Mexico (Trabert 2015). Similar connections served as a means of ensuring mutual survival during times of environmental or social change across the North American continent. Following years of Spanish persecution, some Puebloan people fled their homeland in the seventeenth century and traveled to western Kansas to seek refuge with Dismal River groups that were living around what is now Lake Scott. These migrants built a seven-room masonry pueblo, known as the Scott County Pueblo site (14SC1) or El Cuartelejo, on a terrace overlooking Ladder Creek. This site has been of interest to avocational and professional archeologists since the late nineteenth century and has been excavated on several different occasions (Gunnerson 1998; Hawley 2005; Wedel 1959; Williston and Martin 1900; Witty 1971, 1975, 1986). El Cuartelejo is not the only location where Puebloan and Dismal River peoples and their descendants lived in the area, and other sites, such as 14SC409, provide additional information about the multi-cultural (and possible multi-generational) community that formed in the region during the Protohistoric period.

PREVIOUS RESEARCH AT 14SC409

Site 14SC409 is located on a terrace formed by overbanking flooding from Ladder Creek to the east and partially up the toe of the bluff slope to the south (Figure 1). It was recorded originally in 1976 as a small artifact scatter, covering approximately 9,400 m² on the west bank of Ladder Creek. At the time the surface expression of the site included two ceramic sherds, a small quantity of chipped stone tools and debitage, and a few bone and shell frag-

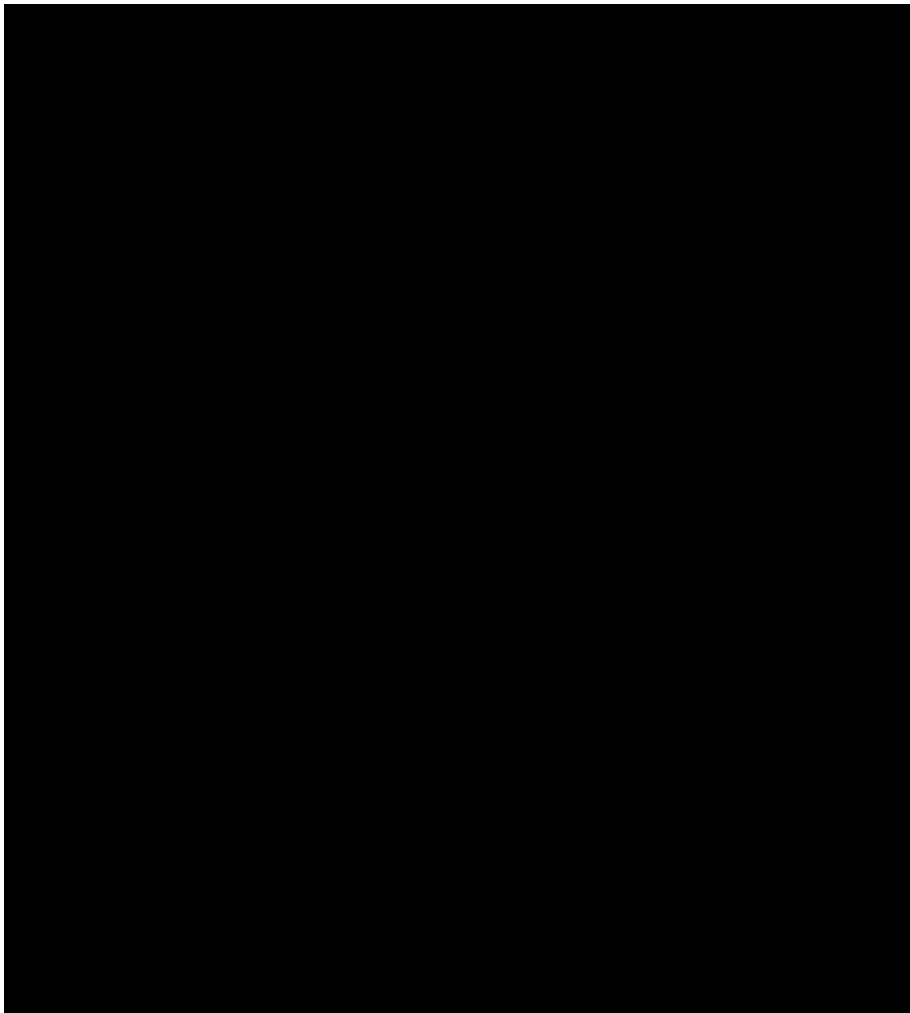


Figure 1. 14SC409 site boundary and location of surface artifacts and excavation block.

ments (Hoard 2009; 14SC409 site file). In 2009 a KATP crew surveyed the entire terrace that contained the site and excavated 18, 1 x 1-m test units in the southeastern portion (Figure 2). Their work greatly expanded the size of the site to approximately 36,600 m² and documented at least one intact buried component that yielded 1,837 artifacts.

The KATP excavations recovered both Dismal River and Puebloan artifacts (Hoard 2009). The vertical artifact distribution indicated a single Dismal River occupation at 17–22 cm below ground surface (bgs), although the presence of at least a few artifacts and pieces of bone at greater depths (~60 cm bgs) suggested that other components might be present. While the 2009 researchers did not attempt to radiometrically date the Dismal River component at 14SC409, discovery of a French gunflint, made from translucent honey-colored flint, with the Dis-

mal River material indicated that the site was occupied between A.D. 1675 and 1800 (Hoard 2009).

KATP workers uncovered a pile of large rocks, identified as Feature 246, which extended into a roughly 1 x 1-m area at the western edge of the excavation block. The rocks were not thermally altered, and the limited excavation area did not permit a full determination of the feature's shape, extent, or purpose. Thus, Hoard (2009) did not classify it as a cultural feature in the project report. The crew removed the rocks from the excavation units at the end of the project, leaving an uneven surface that was covered with plastic before backfilling.

Trabert's (2011) analysis of the ceramic artifacts from the 2009 work revealed that the "local" Dismal River Gray Ware made up only a minority (n = 106; 35 percent), while most of the assemblage (n = 174; 57 percent) consisted of Puebloan

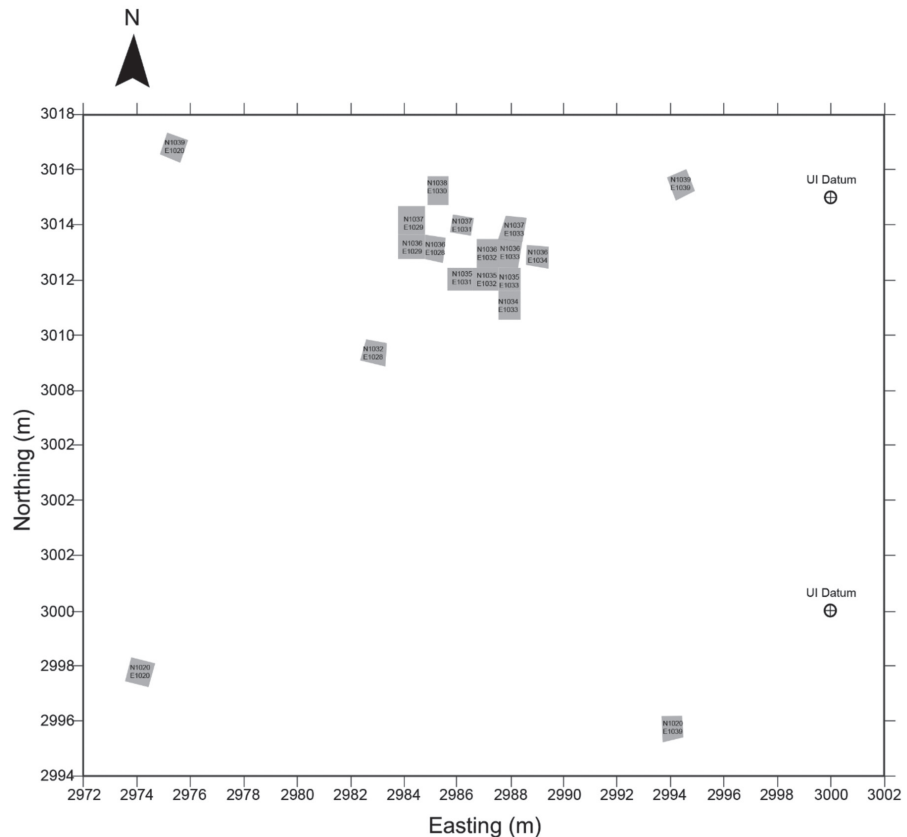


Figure 2. 2009 KATP grid and excavated units.

types, such as Tewa Red, Kapo Black, and Penasco or Tewa Micaceous. Subsequent characterization analyses of these ceramics, however, indicated that the “Puebloan” ceramics likely were made locally, rather than being produced the Rio Grande Valley (Trabert 2015). Nevertheless, the 14SC409 ceramics provide evidence for potters living in this part of western Kansas who locally were manufacturing well-made copies of Northern Rio Grande wares (see discussion of ceramics below). Other Puebloan artifacts recovered during the KATP excavations included two *Olivella* shell beads and a fragment of a square-stemmed decorated pipe. A similar pipe was recovered from Pecos Pueblo (Kidder 1932).

CURRENT INVESTIGATIONS AT 14SC409

The recent round of excavations at 14SC409 is part of a larger research program that focuses on better understanding the nature and extent of interaction between Dismal River and Puebloan migrants in what is now Scott State Park. This broader proj-

ect involves reanalysis of artifacts from 14SC1, systematic dating of several sites within the park, and geophysical and topographical surveys around the pueblo. Construction of a seven-room masonry pueblo, contemporary local manufacture of Rio Grande-style pottery, and use of Northern Rio Grande culinary vessel forms strongly indicate the presence of Puebloan migrants living in the area after A.D. 1600 (Beck and Trabert 2014; Beck et al. 2016). A Dismal River baking pit found under the pueblo and a large quantity of Dismal River Gray Ware at 14SC1 (Beck and Trabert 2014; Witty 1975) signify interaction between local and migrant groups at the site. The results of the 2009 excavations at 14SC409 pointed to the presence of more than one site potentially related to the Dismal River/Puebloan community, leading to continued excavations at 14SC409 in the summers of 2013 and 2014, with follow-up work at the site in 2015.

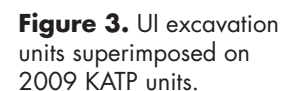
The goals for fieldwork at the site were 1) to enlarge the available sample of artifacts and possible features from the Dismal River component, 2) to collect samples, such as charcoal, diagnostic arti-

and shatter, 9 ceramic body sherds, 4 bone fragments, 2 pieces of fire-affected rock, 1 shell fragment, and 1 piece of adobe/burned earth) were recovered from a roughly 45,000 m² area. The majority of surface artifacts were recovered within a roughly 190 x 70-m area, centered on the main excavation space. This is not surprising, as the original KATP excavation area was chosen because it had the highest concentrations of surface artifacts. Also, a railroad cut ran through this portion of the site, and erosion along the back dirt piles mark the edge of the railroad.

SITE EXCAVATION

The original plan for the 2013 investigation was to continue hand excavation begun by the 2009 KATP crew in a 3 x 4-m area (12, 1 x 1-m units) that encompassed a number of the KATP excavation units. However, it soon became apparent that a number of the 2009 excavation units were not square or oriented to true north. Therefore, the KATP grid system was abandoned and a new grid system, oriented to true north, was created. As a result, a 2 x 3-m excavation block (six 1 x 1-m units) was established, positioned along the western edge of the 2009 KATP excavation block (Figure 3) in order

A total of 175 artifacts (158 chipped stone flakes



to include portions of six of the 2009 excavations units. In 2014 the excavation was expanded with an additional three 1 x 1-m units immediately east of the 2 x 3-m block. The expanded excavation block included portions of two additional KATP excavation units. As will be discussed below, the discovery of human remains resulted in a premature halt to the 2014 fieldwork. Accomplishments of that field season were limited to excavation of three new levels in unit L17, opened in 2013; excavation of three levels in the new unit L8; and removal of KATP back dirt from the new unit L13.

Excavations were done by hand-troweling, using 5-cm-thick excavation levels (Table 1). The fill from the 2009 KATP excavations, as well as the back-fill from the 2013 UI excavations during the 2014 field season, were excavated separately from the undisturbed sediments and screened. The fill from the older KATP excavations was easily identified because of color and textural differences compared to the intact sediment. Additionally, the KATP crew had placed white plastic at the bottom and partially up the sides of its units. The volume of all excavated sediment was measured in liters (L) and screened through 1/4-inch mesh hardware cloth in 2013 and through 1/8-inch mesh in 2014. In total, the excavation of seven 1 x 1-m units, including partial units, removed 2,729 L of sediments, comprising 913 L of former back dirt and 1,816 L of newly excavated sediment.

All but two units (L8 and L13) were excavated below the depth of the KATP excavations, which

generally stopped at 23–38 cm bgs. The one exception was the two units (N1036E1029, N1036E1030) that contained the large rock feature, which ended at the bottom of the rock pile at approximately 45 cm bgs (~999.63-m elevation).

EXCAVATION RESULTS

Overall, the 2013 and 2014 excavations produced fairly modest results in terms of the artifact quantity. In fact, the recent round of excavations produced a much lower quantity of cultural material than was recovered from the 2009 KATP excavation. Only 396 artifacts, consisting primarily of small pieces of unidentifiable bone and lithic debitage, were collected (Table 2). Of the artifacts collected, a substantial proportion ($n = 412$ artifacts; 36 percent of all artifacts) was recovered from the back dirt of either the original 2009 KATP or the 2013 UI excavations. The back dirt screening procedure was instituted in order to identify any artifacts that might have been missed during the original excavations. While the quantity of artifacts recovered from old excavation back dirt might appear high, this number is probably artificially so because the specimens are very small and fragmented. In terms of overall density of artifacts, the degree of uniformity in distribution of artifacts across the excavation units was surprisingly high. Most units had densities between .11 and .16 artifacts per liter of excavated sediment.

When examining the vertical artifact distribution, a clear pattern for clustering emerges. As shown in

Table 1. Key Information for University of Iowa's 2013 and 2014 Excavation Units and 2009 KATP Units Encountered during UI excavations. Grid coordinates and elevations used here are from the UI arbitrary grid system.

Unit Number	SW Corner Coordinates	Number of 5-cm Levels	Elevation Range of Excavations (m)	Total Depth below Surface (cm)	KATP Units Encountered
L6	N3014 E2984	8	1000.126 – 999.692	43.4	N1038 E1030; N1037 E1029
L7	N3014 E2985	6	1000.104 – 999.792	31.2	N1038 E1030; N1037 E1031
L8	N3014 E2986	3	1000.052 – 999.974	7.8	N1037 E1031; N1036 E1032
L14	N3013 E2985	8	1000.114 – 999.702	41.2	N1037 E1031; N1036 E1030
L15	N3013 E2984	8	1000.119 – 999.69	42.7	N1037 E1029; N1036 E1030; N1036 E1029
L16	N3012 E2984	9	1000.139 – 999.665	47.4	N1036 E1029; N1036 E1030
L17	N3012 E2985	10	1000.124 – 999.59	53.4	N1036 E1030; N1035 E1031
L18	N3012 E2986	0	Only removed KATP back dirt	—	N1035 E1031; N1035 E1032; N1036 E1032

Table 2. Artifact Counts and Density by Excavation Provenience Unit.

Unit	Bone	Ceramic	Lithic	Ocher	Other	Sediment Volume (liters)	Artifact Density (#/liter of sediment)
Back Dirt	72	4	62	1	1 Penny 1 Nickel 1 Shell	913.2	.16
L6	33	1	14	3	1 Shaft abrader 1 Burned earth	384.7	.14
L7	7	5	15	0	0	239.3	.11
L8	0	1	7	0	0	62	.13
L14	13	3	24	1	1 Fire cracked rock	264.5	.16
L15	10	2	5	2	1 Shell	134.5	.13
L16	30	0	22	0	0	336.3	.15
L17	23	8	22	2	0	394.8	.14
Totals	188	24	171	9	7	2729.3	.15

Table 3, levels 3 and 4 have the highest concentrations when considering either the absolute artifact count or the artifact density per liter of excavated sediments. Moving through the profile, a gradual increase in artifacts occurs in levels 1 and 2, and then a dense concentration of artifacts appears in levels 3 and 4. A fairly sharp decline in artifacts follows in levels 5 through 8. No artifacts were recovered from either level 9 or 10, although it must be acknowledged that these levels were minimally investigated.

This bell-shaped distribution of artifacts, centered on levels 3 and 4, may indicate that the original occupation surface at the site is associated with

the elevation range of levels 3 and 4. Hoard's (2009) report on the KATP excavation came to a similar conclusion, stating that most of the artifacts were recovered between 17 and 22 cm bgs. In this case the decline in artifact numbers immediately above and below this surface probably represents the re-location of artifacts from the occupation surface through natural disturbance processes, such as rodent burrows and root action. As discussed below, the features encountered in 2013 and 2014 were found in levels below 3 and 4, probably because the lowest portions were excavated below the original occupation level.

Table 3. Artifact Counts by Level and Artifact Density. Elevation measurements used here are from the UI arbitrary grid system.

Unit	Bone	Ceramic	Lithic	Ocher	Other	Sediment Volume (liters)	Artifact Density (#/liter of sediment)
Back Dirt	72	4	62	1	1 Penny	913.2	.16
1 (surface–1000.05)	1	7	15	1	0	201.6	.11
2 (1000.05–1000.0)	11	5	28	0	1 Shell	245.4	.18
3 (1000.0–999.95)	49	6	31	1	0	189.4	.45
4 (999.95–999.90)	39	0	13	2	1 Fire cracked rock	202	.27
5 (999.90–999.85)	8	0	16	2	1 Abrader	177	.15
6 (999.85–999.80)	3	0	2	0	1 Burned earth	234.6	.03
7 (999.80–999.75)	0	0	2	1	0	222.7	.01
8 (999.75–999.70)	5	2	2	1	0	248.5	.04
9 (999.70–999.65)	0	0	0	0	0	52	0
10 (999.65–999.60)	0	0	0	0	0	40	0

ARCHEOLOGICAL FEATURES

Four possible features were encountered during the excavations. Three (features 1–3) are newly identified and tentatively described as postholes (Figure 4). The fourth feature is the rock feature, identified as Feature 246 during the 2009 KATP excavation.

FEATURES 1–3

The three possible postholes were subcircular features, measuring from 11.5 x 10.5 cm to 12 x 12 cm in diameter and ranging in depth from 5 to 11 cm

(Figure 5). No artifacts were present in the fill, all of which was processed through flotation. The nature of the fill, which was obviously lighter in color and looser in consistency than surrounding sediments, suggested that features 1–3 were cultural features. They are not interpreted as filled krotovinas because of their regular shapes and clear edges. Furthermore, the color and texture of sediments within the features were different than that of rodent burrows observed in other areas of the site. In fact, a krotovina dissected the base of feature 1.

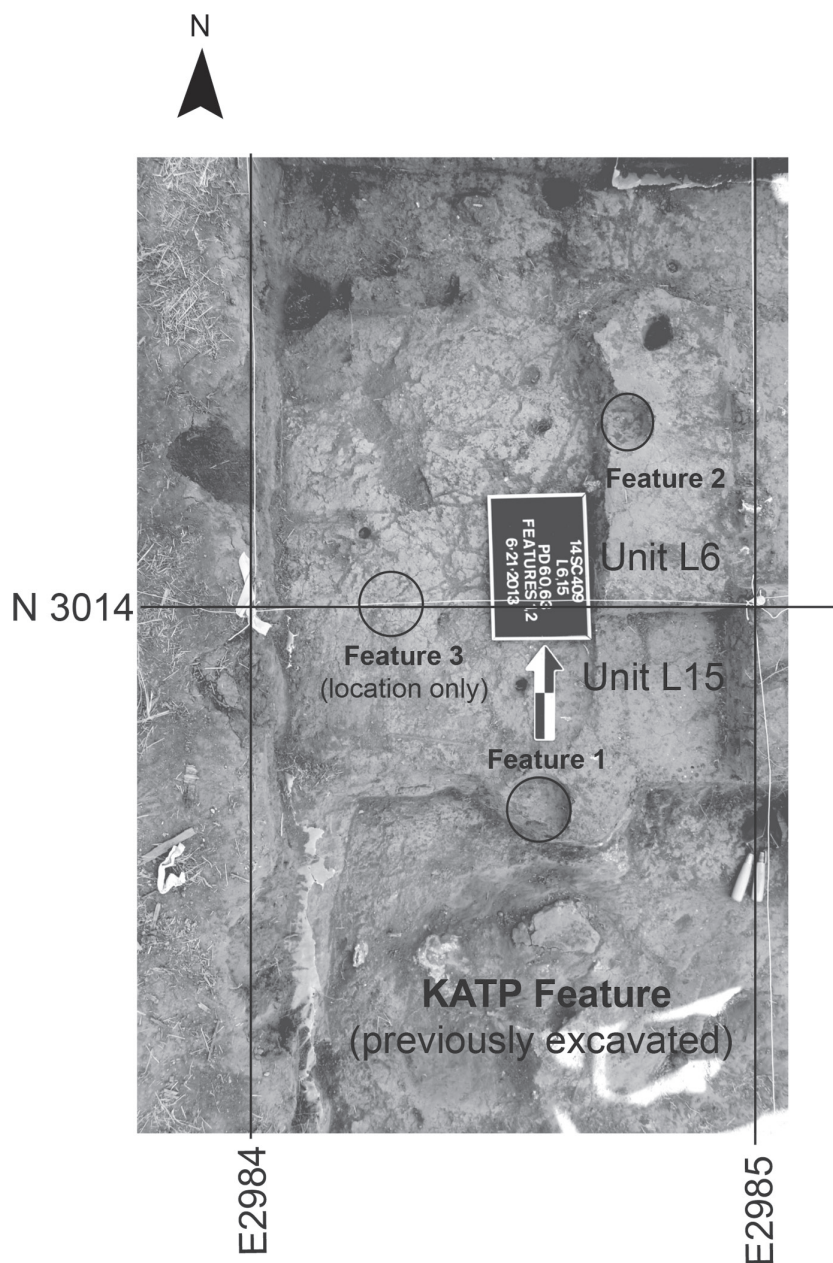
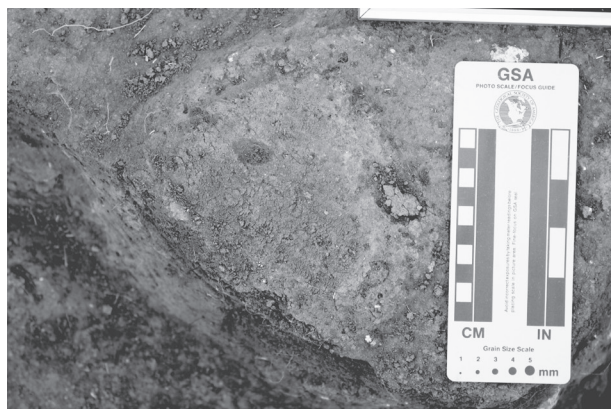
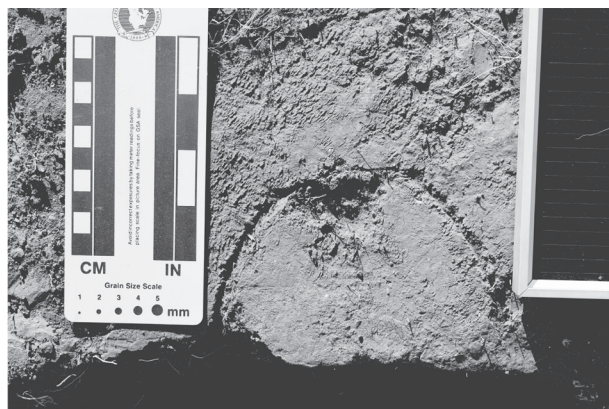


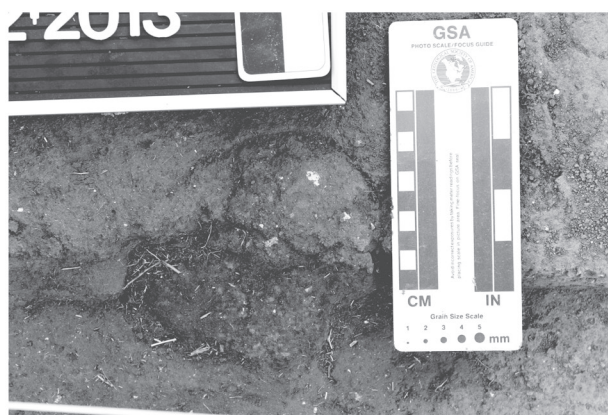
Figure 4. Features 1, 2, 3, and 4.



Feature 1



Feature 2



Feature 3

Figure 5. Features 1, 2, and 3.

These features are tentatively interpreted as postholes because of their size and circular shape when viewed in plan view. However, their shallowness and basin shape make this interpretation more problematic. Possibly these features were present in overlying levels with their upper sections associated with the main occupation surface, but they were not recognized because of ubiquitous rodent disturbance throughout this unit. Therefore, the observed features simply may be the bases of much larger postholes.

Assuming features 1–3 are cultural in origin, and this is not definitively the case, their function is not clear. Their small size and close proximity to one another probably indicates that they did not serve as supports for a structure. Given that they were located along an arc alignment, together they might

have been part of a small wind/sun block. However, without more excavation it may not be possible to determine the function of these enigmatic features.

FEATURE 4

The final feature investigated in 2013 was renamed feature 4, although originally designated Feature 246 in 2009 (Hoard 1995; Trabert and Hill herein). To investigate the feature, four excavation units (L14, L15, L16 and L17) were positioned immediately on top of the original rock feature. After removing the KATP back dirt, which included a substantial quantity of large rocks that likely were part of the feature, the feature boundary was easily observed (Figure 6). After exposure, the area proved to be an irregular oblong depression with distinctly gray sediment. The feature also was defined by a number

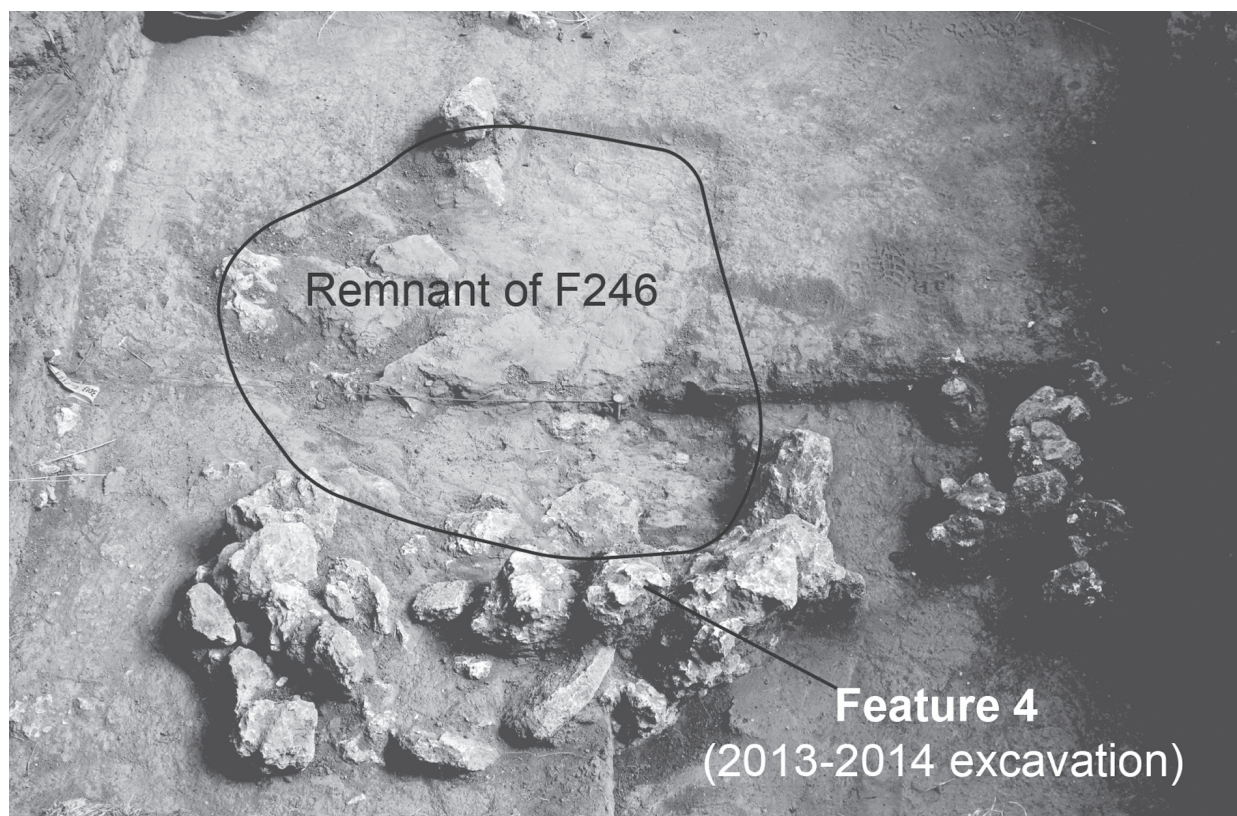


Figure 6. Feature 4 and remnant of 2009 KATP Feature 246.

of partially buried large rocks, which presumably were part of the rock concentration and left in place by the KATP crew. Along the western, northern, and eastern edges of the feature, excavation uncovered a dispersed scatter of small- to medium-size rocks. New excavation units L16 and L17 indicated that the feature was not fully excavated in 2009, and it extended farther south than previously thought.

In the two southernmost units were large rocks that were an original part of the feature excavated during the 2009 KATP. In L16 these rocks were first encountered at 10 cm bgs (~1000.00 m elevation), while in L17 the large rocks were first exposed at approximately 20 cm bgs (~999.87 m elevation). By 35 cm bgs the rock clusters in L16 and L17 merged to form a continuous arc-shaped rock pile. The lack of large rock south of this concentration indicated that the feature ended at this point; had this been a natural feature, such a clear boundary would not be anticipated. More importantly several of the rocks along the southern margin of the concentration were oriented with their long axes sticking vertically out of the ground at an acute angle. Because of limited

time during the 2013 field season, the decision was made to leave all the large rocks in place to be excavated in 2014.

As work resumed at 14SC409 in 2014, initial focus was outside of feature 4. This approach was to confirm the earlier hypothesis that it represented a rock filled pit, which site occupants had excavated, placed large rocks inside along the outside edge, and filled with smaller rocks. However, after removal of only 2 cm of sediment from the feature interior, a portion of a human cranium was exposed. The identification of the bone as human was without a doubt, as key diagnostic features, such as the supra-orbital notch, external auditory meatus, squamosal suture, and coronal suture, were readily identifiable. Following the Kansas Unmarked Burial Sites Preservation Act (75-2741 through 75-2754) and recommendations of Dr. Robert Hoard (Kansas Historical Society) and the Unmarked Burial Sites Preservation Board, all work at the site stopped and the individual was carefully reburied. A full description of the burial and Dismal River mortuary practices can be found in Trabert and Hill (herein).

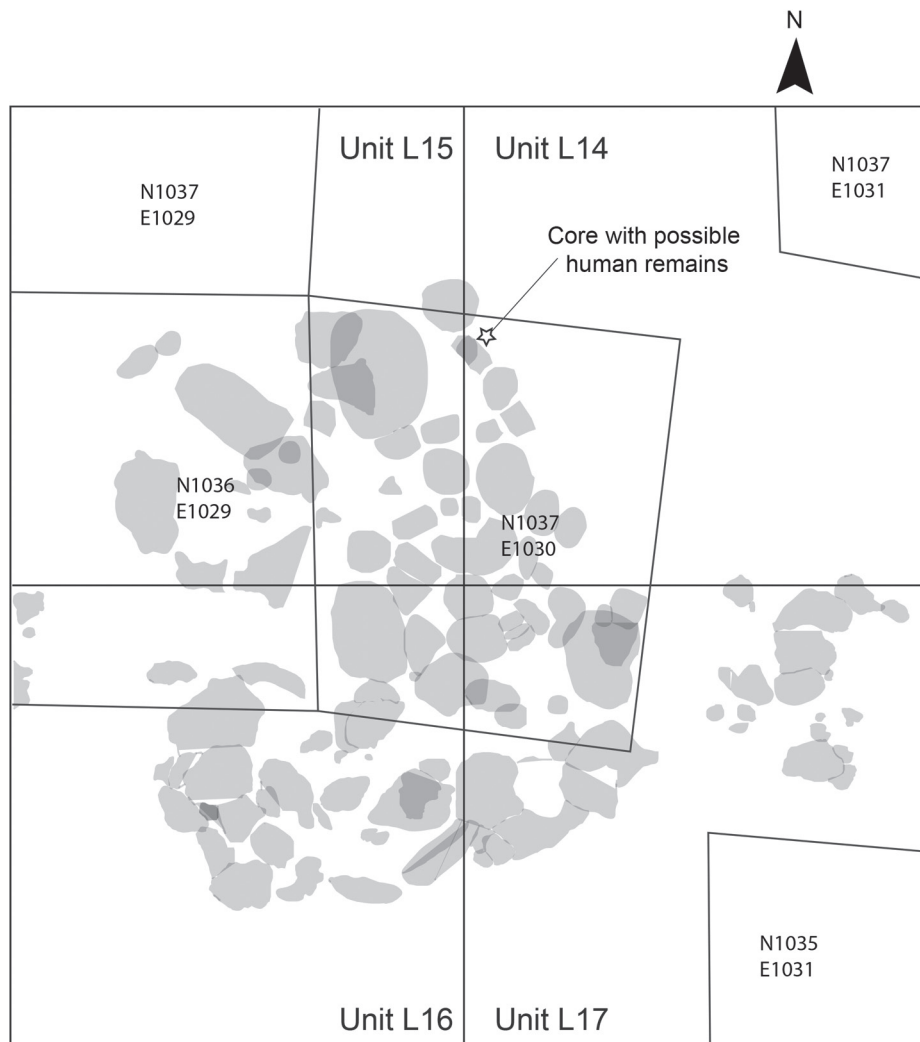


Figure 7. Reconstructed feature 4 with rocks removed by 2009 KATP and rocks still in place during UI excavations. Star represents location of KATP core with possible human remains.

SPECIALIZED ANALYSES

All of the ceramics, lithics, and faunal remains collected from 14SC409 to date have been analyzed by the authors. In addition, two new radiocarbon dates were obtained. The results of these analyses are described below, along with the key interpretation of findings. The social implications and preliminary conclusions about the site and what the artifacts can reveal about the people who once lived at 14SC409 are discussed below.

RADIOCARBON DATING

The age of the 14SC409 was determined through two accelerator mass spectrometry (AMS) radiocarbon dates on bone collagen (Table 4). The two

bone samples were collected from the 2013 excavation unit L16 but were vertically separated by approximately 30 cm. One sample (PD23 – FS14) was taken from a left radius shaft fragment of a pronghorn, recovered from the top of level 3 (999.995 m elevation). This is approximately 15 cm bgs at the approximate level believed to represent the Dismal River occupation surface. The other sample (PD 75 – FS3) was from a left radius shaft fragment of an artiodactyl, likely a deer, which was collected from the top of level 9 (999.69 m elevation) and was immediately adjacent to the rocks forming feature 4, although clearly outside this feature. Even though the two samples were vertically separated by more than 30 cm, they produced similar ages: 125 ± 25 (Aeon-1656) and 120 ± 25 (Aeon-1657) radiocarbon years old. Using the chi-square test function in

Table 4. Results of AMS Radiocarbon Dating for Three Bone (Gelatin) Samples.

Lab Number	Excavation Unit & Provenience Designation (PD)	C:N Ratio	Yield %C	$\delta^{13}\text{C}$	^{14}C Ages (BP)	95.4% (2 σ) Cal Age Ranges (A.D.) ¹	Relative Area under Distribution
Aeon-1656	L16, PD23-FS14	3.26	32.6	-7.6	125 $\pm$ 25	1679–1764	.347
						1801–1894	.497
						1904–1939	.155
Aeon-1657	L16, PD75-FS3	3.28	30.8	10.5	120 $\pm$ 25	1681–1739	.289
						1744–1763	.036
						1802–1896	.523
						1902–1938	.152

Note: ¹ Calibration of radiocarbon dates were performed with the CALIB 7.0.4 program (Stuiver and Reimer 1993) using the IntCal13 calibration curve (Reimer et al. 2013).

OxCal 4.2 (Bronk Ramsey 2001), these two dates were determined not statistically different ($T=0.02$ [5% 3.8], $df=1$). The value given for T is the chi-squared value calculated in the comparison of these two dates. As long as the T value is less than the value given in the bracket, the two dates are unlikely to be different at a .05 p -value. The degrees of freedom are given by df . For the date of 125 ± 25 , the three calibrated ages ranges are A.D. 1679–1764 ($p = .35$), A.D. 1801–1894 ($p = .50$), and 1904–1939 ($p = .16$). For the date of 120 ± 25 there are four calibrated age ranges of A.D. 1681–1739 ($p = .29$), A.D. 1744–1763 ($p = .04$), AD 1802–1896 ($p = .52$), and 1902–1938 ($p = .15$). The identical radiocarbon dates for bones separated vertically is probably due to disturbance processes, such as the rodent burrowing pervasive at the site.

Using several lines of evidence, it can be inferred that the most likely dates for 14SC409 fall between approximately A.D. 1680 and A.D. 1760. First, no historic metal has been recovered from the site; if the site dated in the 1800s, the presence of metal objects would be expected. Second, the French gunflint recovered from the site matches the late seventeenth and early eighteenth century age range (Hoard 2009:70; Kenmotsu 1990). If the A.D. 1680–1760 date range is correct for the 14SC409 occupation, the site was occupied roughly contemporaneously or slightly later than the nearby pueblo at 14SC1. Furthermore, it coincides with the time period when residents of Picuris and other New Mexico pueblos abandoned the Southwest in 1696 (Thomas 1935).

CERAMIC ANALYSIS

As already discussed, the 2009 KATP excavations at 14SC409 recovered 280 ceramic artifacts. During the 2013 and 2014 surface surveys of 14SC409, 6 body sherds were found, and 23 body sherds and 1 rim sherd were recovered during excavations. Of these 30 sherds only 15 (14 body and 1 rim) were large enough (larger than 1 cm^2) for further analysis. Based on temper identification, surface treatment, and color, Trabert estimates that at least five different vessels are represented in this small assemblage.

The rim sherd was recovered in an undisturbed area of L17, approximately 5 cm bgs. It came from a slightly flaring jar that was tempered with quartz sands, was dark gray in color, and had smooth surfaces. The sherd interior was lightly burnished near the top of the rim. No evidence of coiling, slip, paint, or decoration is visible. The interior burnishing, fine paste, and color are similar to Kapo Black pieces, discovered during the 2009 KATP excavations. Although they do not cross fit, this rim sherd is likely part of the same vessel as one body sherd that shares the same characteristics. The 2014 investigations yielded three body sherds that do not match expectations for Dismal River aspect Gray Ware. One surface-collected body sherd is light brown in color, is tempered with medium sand, and has an exterior surface that is slipped (brown) and burnished. A second body sherd, recovered from the KATP back dirt (UI units L8 and L13), has a slightly burnished exterior and a bright red slipped

interior and is tempered with sand and caliche. The third sherd dissimilar to Dismal River aspect Gray Ware was recovered in an undisturbed portion of L8, approximately 5 cm bgs. This sherd is tempered with medium sand and has a brown-slipped and burnished exterior surface and a bright red interior slip.

The remaining 11 body sherds, although small (between 1 cm² and 5 cm² in size), fits expectations for Dismal River aspect ceramics. Sherds range in color from light brown to black, and none is decorated, slipped, or painted. All except one of the body sherds were tempered with fine to medium quartz and feldspar sands, while four had larger quartz inclusions, and three had caliche inclusions. One body sherd, found on the surface, was tempered with very fine micaceous sands, but it does not appear to be one of the identifiable Southwestern micaceous types, as it probably was not made with micaceous clays. All body sherds have smooth surfaces with no evidence of simple stamping. Four of the sherds have lightly burnished exteriors, and two have lightly burnished interiors. Maximum thicknesses range from 4.2 to 8.1 mm with a median of 5.1 mm.

Of these 15 sherds, 6 might be nonlocal (the potential Kapo black rim, the slipped body sherds, and the sherd tempered with micaceous sands), but their small size limits conclusive statements about their origins. Similar ceramics have been recovered from the nearby Scott County Pueblo site, and a sample of these supposedly “Puebloan” ceramics from 14SC1, 14SC409, and 14SC304 (another Dismal River aspect site near Lake Scott) were thin sectioned and petrographically analyzed. Petrographic microscopy is the study of translucent slices of ceramic sherds when viewed under a microscope with cross-polarized light. Petrographers can identify the minerals present in the slides by examining how light passes through the minerals present (Rice 1987; Stoltman 2001). Dr. David Hill, an expert in petrographic analysis, examined the sample of nonlocal sherds recovered from these sites, as well as samples of sand collected within Scott State Park (Hill 2014).

Hill (2014) classified six red-slipped and one polished black sherd as locally made, as they contained minerals and inclusions common to material available in the area. Hill did not identify any significant volcanic inclusions, as one would expect

with ceramics manufactured in northern New Mexico. These results are highly significant because they indicate that people at these western Kansas sites were manufacturing pottery that was similar in paste, surface treatment, and form to ceramics made in New Mexico. These locally made copies of Puebloan vessels are very well made, not simply imitations, which means that Puebloan potters and their descendants made these vessels in Kansas in a style that they themselves or their immediate ancestors learned in the Pueblo communities of New Mexico (Beck et al. 2016). These results support earlier conclusions, drawn by Beck and Trabert (2014), that Puebloan women lived in the area and crafted vessel forms (bowls and short-upright jars) commonly made and used in New Mexico that were associated with foodway practices not common to Plains groups.

LITHIC ANALYSIS

The 2009, 2013, and 2014 investigations at 14SC409 yielded a total of 1,001 lithic artifacts: 729 from the KATP and 272 from UI investigations. Of these, 602 artifacts collected from excavated contexts were chosen for further analysis; surface artifacts are not discussed here. In addition to the analysis of the 2013 and 2014 artifacts, Cooley also reanalyzed the lithics collected during the 2009 KATP excavation. Data were collected on a number of attributes, including material (color and type), thermal alteration, presence of cortex, type of object (flake, shatter, or tool), and measurements (platform width and depth, overall length and width, thickness, and weight). Comparative collections from the University of Iowa and Oklahoma Archeological Survey were used for raw material classifications.

Most of the 14SC409 lithic artifacts are made from locally available Smoky Hill chert ($n = 438$; 73 percent) with lesser frequencies of nonlocal Florence chert ($n = 64$; 11 percent), chalcedony ($n = 45$; 8 percent), Edwards ($n = 3$; <1 percent), quartzite ($n = 7$; 1 percent), and basalt ($n = 3$; <1 percent) (Table 5). A total of 42 lithic specimens come from currently unknown sources. While Smoky Hill cherts are considered more “locally” available, the nearest source of these materials is 80 km away from the Lake Scott area (Butler 1997). A small number of lithic flakes recovered from excavations at the site

Table 5. Lithic Raw Material Counts for Excavated Materials Only.

Lithic	Smoky					
	Hill	Florence	Quartzite	Edwards	Chalcedony	Basalt
2009 Excavation						
Scraper	15	1		1		
Biface	2					
Drill	1					
Core	12					
Projectile point	1					
Debitage	353	44	8	7	19	4
2013–2015 Excavations						
Scraper						
Biface	2					
Drill						
Core						
Projectile point	1					
Debitage	144	9	1	3	6	
Totals	519	54	21	11	25	4

showed evidence of thermal alteration ($n = 116$; 19 percent); however, a lack of comparable data from other Dismal River sites makes it difficult to determine if this is a low or high proportion of the assemblage.

Data collected on the number of dorsal surface flake scars, bulb of percussion size, and amount of cortex present on the flakes indicate that people living at 14SC409 were using primarily soft hammer percussion to complete late stage bifacial reduction and tool retouch. Most of the flakes recovered from the site are small (average length of 14.5 mm), and 85 percent do not have any cortex present, pointing to predominately bifacial reduction rather than early stage cobble reduction.

Very few stone tools have been recovered from excavated contexts at the site ($n = 38$), with scrapers being the most common tool form ($n = 21$; 55 percent). Bifaces are the next most common ($n = 8$; 21 percent), followed by drills ($n = 2$), projectile points ($n = 2$), sandstone abraders ($n = 2$), spokeshaves ($n = 2$), and a mano ($n = 1$). The projectile points are triangular, and side-notched with concave bases, which is consistent with other Dismal River assemblages and a Late Ceramic period occupation (Gunnerson 1960; Hoard 2009; Wedel 1959). The frequency of scrapers is also consistent with Dismal River groups, as hide production was an important

economic activity for many Great Plains groups during the Protohistoric period (Hoard 2009; Vehik 2002).

FAUNAL ANALYSIS

The UI investigations at 14SC409 yielded a total of 198 faunal remains, of which 116 specimens (59 percent) came from intact excavated contexts. The remaining faunal remains include 72 specimens (36 percent) recovered by screening back dirt from previously excavated units and 10 potential archaeological specimens (5 percent) collected from the surface. Because of the small size of the UI faunal assemblage, this analysis also incorporates faunal remains from the 2009 KATP excavation. This faunal assemblage consists of 1,635 specimens, including 10 objects from the surface. The following analysis does not consider material recovered from the surface or from the excavated back dirt.

The analysis of the 14SC409 faunal remains utilized detailed taphonomic observations that identified specimens to class (either taxonomic identification or a body size category), element (skeletal bone), portion (subdivision of bone), and segment designation (subdivision of portion) (Todd 1987). Taxonomic identification (species or genus) was made using UI's comparative faunal collections

for the larger and identifiable specimens. Observations also were made on the presence, type, and location of subaerial weathering, carnivore and rodent gnawing, burning, rootlet etching, bone breakage, humanly induced impacts, and human butchery and other striations.

Overall the 1,645 faunal specimens (1050.6 grams) analyzed in this study are highly fragmented; bone specimens have an average mass of just 1.8 grams, and the largest weighs less than 50 g. Because of this high degree of fragmentation, only about 3 percent (NISP = 56) is identifiable to genus or species level (Table 6). As a result, a majority of the assemblage was coded either as very small unidentifiable fragments (n = 1,274; 73 percent) or mammalian remains identified to general mammal body size (i.e., very small-, small-, medium-, or large-bodied mammals) (NISP = 648; 24 percent). This body-size classification was assigned based on bone thickness and morphology of the specimens.

Although the 14SC409 assemblage consists primarily of small, hard-to-identify fragments, a surprising diversity of animals was recognized. Eight genera were identified; however, it cannot be established definitively that more than one individual was represented in each. Furthermore, it is unlikely that all of these taxa were utilized by humans. In particular, it is suspected that all the rodent and rodent-size

remains, including prairie dog and very small mammal, were incorporated in the site by accident. A portion of a modern 13-lined ground squirrel skull, collected from a filled rodent burrow during the UI excavations, is not included in this analysis.

Two species of carnivore, fox (*Vulpes vulpes*) and an indeterminate canid, were recovered from 14SC409. Much of the small-size mammal remains (NISP = 48) likely represent carnivores, as bone thicknesses suggest species larger than rabbits or hares. What species of canid is uncertain, but a medium-size animal, such as a small domesticated dog or coyote, is suspected. Even though the identified fox and canid remains do not show evidence of human alteration, the presence of burning and impact marks on a number of the small-size mammal remains opens the possibility that site occupants utilized these carnivores for food. A larger sample of material would be necessary to support this statement, however.

A significant portion of the 14SC409 collection consists of artiodactyl remains. Bison, pronghorn, and deer remains make up a significant segment of the identifiable species. Also, these taxa probably are primarily responsible for the majority of material categorized as indeterminate medium-size mammal (i.e., deer and pronghorn) (NISP = 233) and indeterminate large-size mammal (i.e., bison)

Table 6. Summary of Number of Specimens (NSP) for Identified Faunal Species and Key Taphonomic Observations.

Species	Iowa NSP	KATP NSP	Total NSP	Total MNI	Green NSP	Burn NSP	Impact NSP	Cut NSP
Prairie dog		3	3	1				
Unidentified rodent		1	1	1				
Fox		1	1	1				
Canid	1	2	3	1				
Deer	2	1	3	1				
Pronghorn	1		1	1	1			
Bison	1	13	14	1	11	1	3	
Very small mammal (rodent size)	4	14	18	—				
Small mammal (rabbit to canid size)	11	37	48	—	7	12	1	
Medium mammal (deer or pronghorn size)	21	212	233	—	37	30	1	2
Large mammal (bison size)	1	115	116	—	31	4	5	
Unidentifiable (likely mammal)	72	1202	1274	—	3	13	1	
Mussel	1	20	21	—				
Turtle		4	4	1				
Totals	116	1625	1741		90	60	11	2

(NISP = 116). Not surprisingly, the artiodactyls appear to be important economically to the 14SC409 occupants.

Of the identified species only the bison remains show evidence of burning and impact damage. However, the indeterminate medium- and large-size mammal specimens also exhibit abundant evidence of cultural modification. It is important to understand that the observed level of cultural modification greatly underestimates the true intensity of human alteration. In particular, a large portion of this assemblage is heavily impacted by root etching, which can obscure 75–100 percent of the exterior bone surfaces and makes detecting cut or impact marks very difficult. Of the 261 specimens coded for root etching, nearly 65 percent ($n = 170$) of specimens are affected.

While only a small number of artiodactyl skeletal elements could be distinguished, those that were identified are mostly major limb elements, such as humerus, radius, femur, and tibia (Table 7). Only two small enamel fragments, both likely from deer, were recognized, despite the fact that teeth are highly identifiable when present. Also, small quantities of broken rib and vertebral bones were recorded. Overall, it appears that site occupants were focused primarily on the economically valuable (i.e., meat and fat-rich) limb portions of artiodactyls.

While most of the faunal species observed at 14SC409 were terrestrial species, the site occupants probably used some aquatic species. Four turtle shell fragments, likely box turtle, and numerous small fragments of freshwater mussels were recovered. As with the mammal remains, all turtle and mussel fragments could have originated from single individuals. No evidence of burning or other forms of human modification were observed, so it is uncertain if these resources were used as food.

In conclusion, the 14SC409 occupants apparently used a fairly wide variety of animals, even given the relatively small size of the faunal assemblage. The low quantity of faunal remains normally would suggest a fairly short occupation. However, it seems that this group spent time finding and acquiring a number of different taxa, rather than preferentially focusing on any one taxon. This behavior implies that the people made considerable effort to forage for or collect animal resources as they became available, indicating that they made an extended stay at the site or repeatedly visited the locality.

SUMMARY AND SOCIAL IMPLICATIONS FOR 14SC409

The 2009 and 2013–2015 investigations at 14SC409 yielded artifacts that are consistent with a Dismal

Table 7. Number of Individual Specimens (NISP) by Skeletal Element for Various Artiodactyls.

Skeletal Element	Bison NISP	Pronghorn NISP	Deer NISP	Large Size NISP	Medium Size NISP
Crania-mandible			1		1
Vertebrae	1			2	1
Rib	3			28	94
Scapula					
Humerus	3		1		2
Radius-ulna		1			2
Metacarpal				1	
Carpals					
Innominate					
Femur	3			2	1
Tibia	3	1			2
Metatarsal					
Tarsal					
Phalanges			1		

River or Apache occupation (Hoard 2009). The 2009 KATP excavations yielded evidence of Dismal River and Puebloan objects (*Olivella* shells and Puebloan-style pottery) but no hearths, roasting pits, or other features (Hoard 2009). Based on the disproportionate number of scrapers in the 2009 lithic assemblage and the lack of identifiable cultural features, Hoard (2009) suggested that the site represented a short-term occupation, possibly for butchering animals. Subsequent analyses of all artifacts from 14SC409 points to either an extended residence at the site or repeated use of the locality. The diversity of faunal remains, as well as numerous non-lithic artifacts (ceramics, clay pipes, ground stone, and shell beads), do not support a specialized butchering focus for the site. Rather, the diversity and abundance of artifacts and faunal remains, along with a human burial and possible small wind/sun shelter, suggest that 14SC409 was used as a short-term residential camp where a number of subsistence and non-subsistence activities occurred. At this point it is difficult to say in what season or seasons the site was used.

The requirement to cease investigations upon the discovery in 2014 of human remains results in a very limited understanding of the nature of the burial and makes inferences about associated burial practices quite difficult. The brief investigation of this burial offered an intriguing glimpse into Protohistoric burial practices, but many more questions remain. As only the cranium was uncovered, the exact orientation of the body and the individual's sex, age, ethnicity, and cause of death are uncertain. However, other data sources could assist in understanding this burial. In Trabert and Hill (herein) the authors review the archeological and ethnographic literature for contemporary Puebloan and Apache groups to learn more about their burial practices. Puebloan groups tended to bury their dead near their living areas and did not commonly cover graves with rock and brush piles (Brugge 1978; Kidder 1958). Athapaskan (Apache) mortuary practices did include the use of shallow pits for internment, which were then often covered with rocks and brush (Carlson 1965; Hester 1962; Opler 1941, 1959). Athapaskan-speaking groups commonly burned the belongings of the deceased and abandoned structures and campsites where a death occurred (McAllister 1937; Opler 1941, 1983).

The location and types of burial practices shown at 14SC409 share similarities with Athapaskan burial practices, providing a link between site occupants and other Apache peoples. However, it is important to note that this site also likely was connected to the occupation of the pueblo at 14SC1. 14SC409 was occupied around the same period as 14SC1, and given the proximity of the two sites, it is doubtful that the Puebloan migrants living at the 14SC1 pueblo had no influence on or interaction with those living at 14SC409. Additionally, the high frequency of locally made copies of Puebloan ceramics—the red wares in particular—found at 14SC409 further demonstrate that Puebloan preferences in ceramic vessel style and foodways were present there. It is impossible to know if the people living at 14SC409 considered themselves Apache, Puebloan, both, or neither, as the customs of the living group, and not necessarily the individual, are reflected in burial practices.

While very few Dismal River sites have been dated chronometrically, it appears that the Dismal River/Puebloan occupation of 14SC409 and other sites in the immediate area, dating between A.D. 1680 and A.D. 1760, probably represents the terminal occupation of the Central Plains by this group. Additionally, these Scott County, Kansas, sites present a unique glimpse into broader social and economic exchange networks between peoples living on the Plains and those in the American Southwest. Not only were goods moving along exchange networks, but migrants as well, and this Plains-Pueblo relationship certainly influenced the lives of 14SC409 inhabitants. Sites like this continue to provide invaluable insights into the complexities of Protohistoric communities, as intersecting peoples, identities, technologies, and practices connected, continually shaping and reshaping the occupation of the Central Plains.

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WHEN ETHNOGRAPHY AND ARCHEOLOGY MEET: A DISCUSSION OF DISMAL RIVER ASPECT MORTUARY PRACTICES

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Human burials are not commonly recovered from Protohistoric era (AD 1450–1700) sites on the Great Plains. The recent accidental discovery of a burial at a Dismal River aspect site (14SC409) in Kansas provides an opportunity to investigate the mortuary practices of this archeological culture. Understanding social identity during this time on the Central Plains is problematic, as the residents of 14SC409 were living in dynamic communities composed of members who likely held direct cultural ties to indigenous Plains populations and migrant Puebloan communities from the American Southwest. Ethnographic and archeological information on contemporary Central Plains, Puebloan, and Athapaskan mortuary practices were analyzed to compare to the limited data collected from this newly discovered burial. Comparisons between ethnographic burial practices and limited archeological remains are one way to make meaningful inferences concerning past burial rituals and this work indicates that the 14SC409 burial shares similarities with seventeenth through nineteenth-century Athapaskan mortuary practices.

Archeologists working on the Great Plains often face several challenges when investigating sites from the Protohistoric period (A.D. 1450–1700). Evidence from mortuary or burial contexts, often significant to discussions of identity and demography are commonly missing as archeologists rarely encounter human burials in this region after the end of the Late Prehistoric period (approximately A.D. 1400). In their discussion of Great Bend aspect sites (an ancestral Wichita group living in Kansas from A.D. 1425 to 1675), Blakeslee and Hawley (2006:170) comment on the lack of mortuary data during this period: “. . . purposeful human interments of any sort appear to be absent. There are no cemeteries, no burial mounds, no ossuaries, and no cremations for the many thousands of people who lived in Kansas for centuries, producing the remains that we classify as Great Bend.” Material evidence of burial rituals, when present, can provide archeologists with innumerable insights into past social organization, exchange, migration, and religious beliefs and can be used to determine cultural af-

filiation for human remains (Carr 1995). However, these lines of inquiry and evidence are difficult to address for the Central Plains after A.D. 1400.

The recent accidental discovery and partial excavation of a human burial at a Dismal River aspect site (14SC409) in western Kansas (roughly contemporaneous to Great Bend aspect occupation) is, therefore, significant for a number of reasons (Figure 1). Not only are human burials from this period relatively rare, but they are also rare for this particular archeological culture. (This is only the second burial identified.) Additionally, this discovery presents an opportunity to consider the cultural affiliation of the community of individuals who lived at the site. Mortuary practices are important social rituals that reinforce group cohesion and often are resistant to significant social change, retaining many traditional elements even after contact with Europeans (Binford 1971; Gamble et al. 2001; Kidder 1958; Parker-Pearson 1999; Prince 2002). The behavioral and material record of a burial ritual reflects a group's collective (and idealized) belief

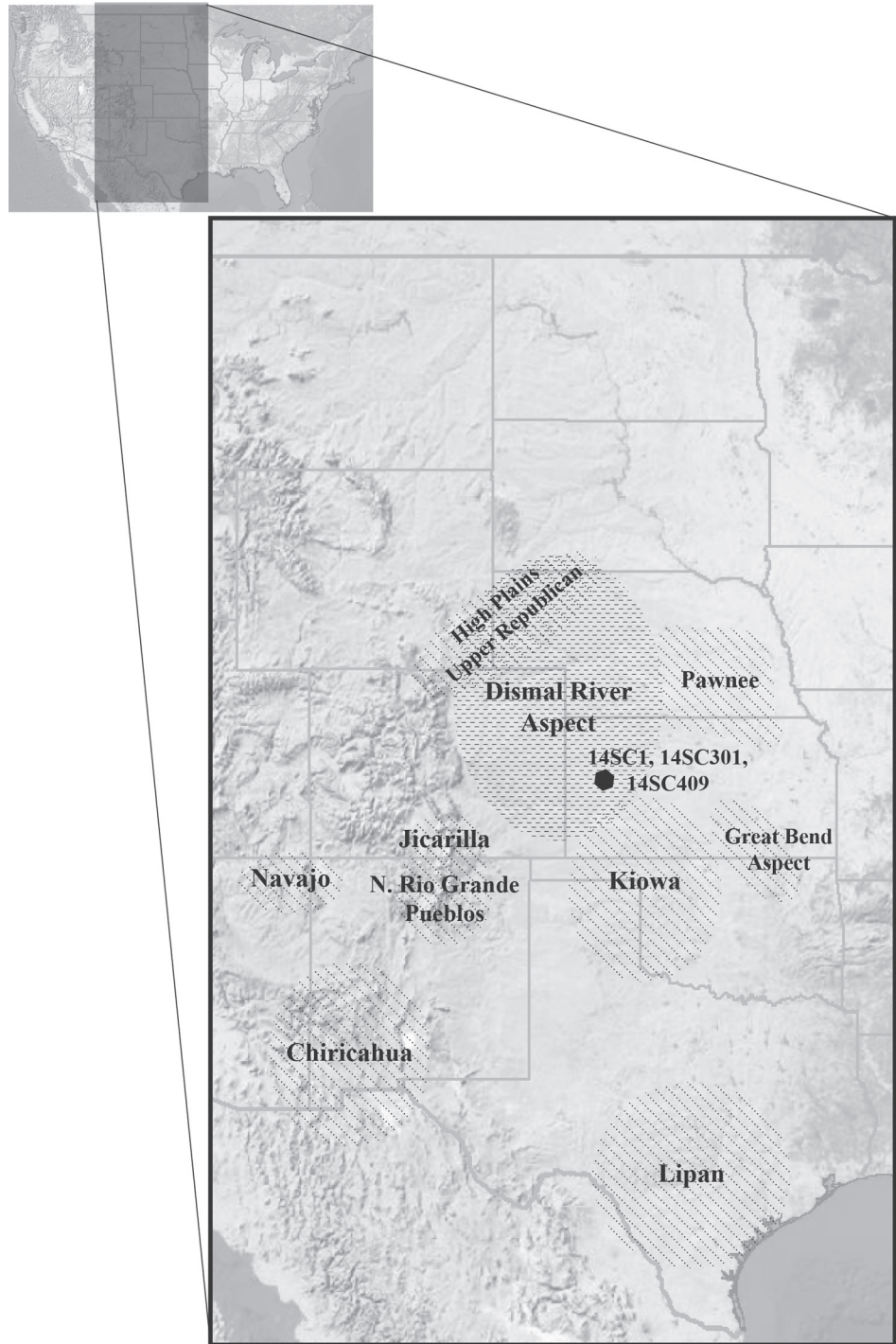


Figure 1. Location of 14SC1, 14SC301, and 14SC409 in relation to the distribution of indigenous groups discussed in the text (base map from ArcGIS ESRI USA Topo Map; group locations from Blakeslee and Hawley 2002:175; Ferg 2004:33, Levy 2001:907; Opler 1983; Parks 2001:515).

system, and archeologists can examine culturally distinct practices to better understand who was living and dying in prehistoric and historic communities (Bourdieu 1990; Carr 1995; Emberling 1997; Jones 1997). Individuals, however, can hold multiple identities, and in highly interactive, multieth-

nic settings new identities can be constructed and practices transformed to reflect fluid social environments (Ferguson 1992; Lightfoot 1995; Mullins and Paynter 2000). The potential for multiple identities might be quite significant to this study, as historic accounts and archeological evidence suggest that

during the late seventeenth/early eighteenth centuries western Kansas, including site 14SC409, was an area of residence for a pluralist community of indigenous peoples (Beck and Trabert 2014; Beck et al. 2016; Opler 1982; Trabert 2014, 2015). This community consisted of Puebloan migrants from the Rio Grande valley of New Mexico, living alongside indigenous Dismal River people for several generations. This multicultural and multiethnic community likely formed in response to changing social, economic, and political upheavals created by the Spanish occupation of the American Southwest, and as an outgrowth of generations-old trade and intermarriage partnerships between Southwestern and Great Plains groups (Baugh 1991; Spielmann 1983; Vehik 2002).

The temporally extensive and intimate contact between groups on the Plains and the American Southwest might have resulted in many different configurations of multiethnic communities, such as at 14SC409, where residents likely carried and exhibited several identities (Trabert et al. herein). The “problem” with social identity in this situation arises from the fact that, while the 14SC409 burial is located at a Dismal River site, an archeological culture that is traditionally inferred to have direct affiliation with Apachean groups (e.g., Gunnerson 1969, 1987; Gunnerson and Gunnerson 1971; Schlesier 1972; see alternative perspective in Gullely 2000 and Opler 1982), it cannot immediately be assumed that the individual was ethnically Apache, as he could have been Puebloan, or both/neither. Individuals living in plural (creolized) communities made decisions to accept or reject certain cultural norms and practices while they are alive (Cusick 2000; Stojanowski 2005). Likewise, important social ritual, such as burial rites, result from intentional decision making on the part of surviving group members on to how reflect the identity of the deceased. Given the social complexity that might be involved in creating Dismal River burials, this paper does *not* focus on whether to this particular individual held an Apachean or Puebloan identity. Instead, the analysis here focuses on the ways by which the site occupants, living in such a dynamic community, “created” identity through mortuary behaviors. As it is generally accepted that Dismal River peoples were ancestral to later Apachean groups, the creation process may involve decisions to 1) follow

“traditional” Apachean or Puebloan practices, 2) combine practices from both traditions, or 3) create entirely new practices. Data on how Dismal River people “structured” their mortuary practices is an important, but so far missing, element in studies of how these groups conceptualized their own identity.

This paper begins with a summary of what is known about Dismal River burials and highlights the complex relationship between the different groups living on the Central Plains during the Protohistoric period. The discovery and nature of the 14SC409 burial is then described and the findings compared to the only other known Dismal River burial. Drawing on archeological and ethnographic descriptions of mortuary practices from the Central Plains and American Southwest, direct comparisons are made to available data from Dismal River sites. The 14SC409 burial is most consistent with historic accounts of Athapaskan mortuary practices and archeological evidence for Apache burials with little obvious evidence for blended practices.

DISMAL RIVER ASPECT

The Dismal River aspect is an archeological complex dating between the late fifteenth to early eighteenth centuries, with associated sites located across eastern Colorado, southeastern Wyoming, western Kansas, and western Nebraska (Gilmore and Laramore 2012; Gunnerson 1968; Scheiber 2006) (Figure 1). Many researchers have argued that these sites represent a distinct group of people unified by a common Athapaskan heritage (Brunswig 1995; Gunnerson 1960:239; Schlesier 1972:101; Trabert 2014; Wedel 1959, 1986). Problematising the direct link between Dismal River sites and later historically known tribes is the variation that archeologists see in terms of site architecture and organization, subsistence practices, and material culture. Much of the variation in the archeological expression of Dismal River relates to adaptational differences in geographic variability of the environments that these groups occupied.

Dismal River people living in modern-day Kansas and Nebraska resided in semi-permanent horticultural settlements whose subsistence also relied heavily on bison hunting (Brunswig 1995; Champe 1949; Gunnerson 1968; Hill and Metcalf 1942; Strong 1935; Wedel 1959). Groups occupying

western Dismal River areas (i.e., Colorado and Wyoming) utilized short-term camp or limited occupancy rock shelter sites. Here people were focused on seasonal hunting and gathering activities rather than horticulture (Cassells 1997; Gilmore and Larimore 2012).

The geographic distance between many Dismal River settlements, combined with their mobility, led to interaction and exchange with different neighboring groups. Northern Dismal River groups likely traveled between areas of western Nebraska and southeastern Wyoming, potentially putting them in contact with High Plains Upper Republican, Northeast Shoshone and Apsaalooke, and Middle Missouri tradition peoples (Aikens 1966, 1967; Gunnerson 1969; Schleisier 1972; Trabert 2014). Dismal River communities in the southern portion of their territory (southeast Colorado and western Kansas) were in position to potentially interact with Great Bend (ancestral Wichita) groups in eastern Kansas and Oklahoma (Figure 1).

As stated above and elsewhere in this volume (Trabert et al. herein), there is definitive evidence for sustained contact among Puebloan peoples from northern Rio Grande villages and Dismal River communities in western Kansas (Beck and Trabert 2014; Beck et al. 2016; Opler 1982; Trabert 2014, 2015) (Figure 2). The connection between the American Southwest and the Great Plains likely existed for centuries or perhaps millennia prior to the appearance of Dismal River groups (Brosowski and Bevitt 2006; Kidder 1932; Scheiber and Finley 2010; Spielmann 1991; Wedel 1982). Ancestral and early modern pueblo peoples exchanged a number of goods with various Plains tribes, including bison products, obsidian, ceramics, and agricultural products like maize. Historically, due in part to their mobility, Athapaskan groups bridged the gap between major resource regions and acted as agents in multicultural exchange involving multiple pueblos and Caddo-speaking people (Eiselt 2006). Various forms of mobility were used in the Southwest in response to environmental or social stress (Stark et al. 1995; Zedeño 1995). Spanish interference in Puebloan communities led many people to leave their homes along the northern Rio Grande and travel west, east, and north to escape colonial activities (Kulisheck 2003, 2010; Spielmann et al. 2006). The Lake Scott area in western Kansas was one of these destina-

tions for some Puebloan migrants as pueblo architecture and Puebloan ceramics at 14SC1 can attest (Beck and Trabert 2014; Beck et al. 2016; Trabert 2015; Witty 1983) (Figure 2). Site 14SC1 includes a seven-room masonry pueblo and evidence of the local manufacture of Rio Grande style pottery and the use of Northern Rio Grande culinary vessel forms (i.e., emphasis on bowls). This evidence indicates that Puebloan migrants lived in the area and continued ceramic manufacturing and foodways practices they learned in their homeland. Additionally, the pueblo was built on top of an earlier Dismal River component, and Dismal River pottery was recovered in large numbers in direct association with Puebloan artifacts from 14SC1, indicating that Dismal River people also lived at the site (Beck and Trabert 2014; Witty 1975). Other sites in the Lake Scott area, which likely date slightly older than 14SC1, also have yielded evidence for direct interactions between Dismal River and Puebloan peoples.

DISMAL RIVER MORTUARY PRACTICE: THE 14SC301 BURIAL

Despite evidence for approximately 250 recorded Dismal River sites across the Central Plains (Gulley 2000:Appendix A; Trabert 2015:Table 3), prior to the 2014 work, there is only one published account of a human burial. This site, 14SC301, originally recorded as 14SC103 by Gunnerson (1969), is located in the Lake Scott State Park on an eastern terrace adjacent to Ladder Creek (Figure 2). Several roasting pits have been excavated at the site, including one that contained a human burial (Gunnerson 1969; Hoard 2009; Witty 1973, 1985). In 2009 the Kansas Archeology Training Program (KATP) surveyed this site and collected 300 artifacts, including three slipped sherds (one red, one buff, and one black) (Hoard 2009).

The burial was discovered around 1951 by a local collector. Dr. James Gunnerson at the University of Nebraska-Lincoln was informed of the burial some time later (perhaps in the late 1960s) and given access to the bones and photographs of the excavations, which he used to prepare a summary report (Gunnerson 1969). The burial reportedly was found in a pit, which had burned walls and fill of abundant ash and charcoal. As the skeletal remains were

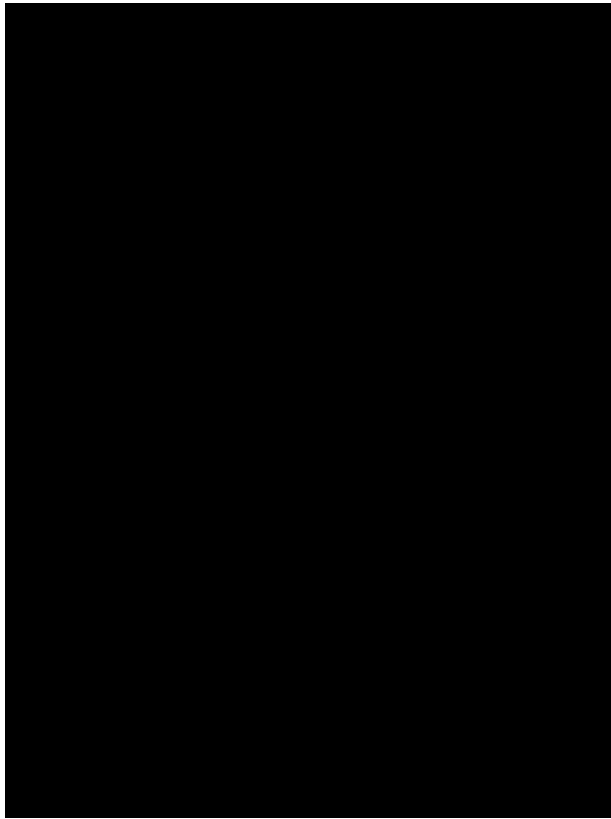


Figure 2. Location of 14SC1, 14SC301, and 14SC409 in relation to Lake Scott and Ladder Creek in Scott, County, Kansas.

not burned, Gunnerson surmised that the pit was a roasting oven that later was converted to a burial pit. The individual was buried in a tightly flexed position on his right side, with his head oriented north and his face directed west (Figure 3). A large flat stone was placed above the skeleton. The deceased was a male in his early twenties and was approximately 170 cm (5 feet 7 inches tall). No cause of death could be determined (Gunnerson 1969:49).

SITE 14SC409 AND THE SECOND DISMAL RIVER BURIAL

Work at 14SC409 is part of a larger research program, focused on better understanding the nature of interaction between Dismal River and Puebloan populations around what is now Lake Scott in western Kansas. It has included field work at the Scott County Pueblo (14SC1) (Beck and Trabert 2014; Martin 1909; Witty 1983) and the nearby contemporary site 14SC409 (Hoard 2009). A complete dis-

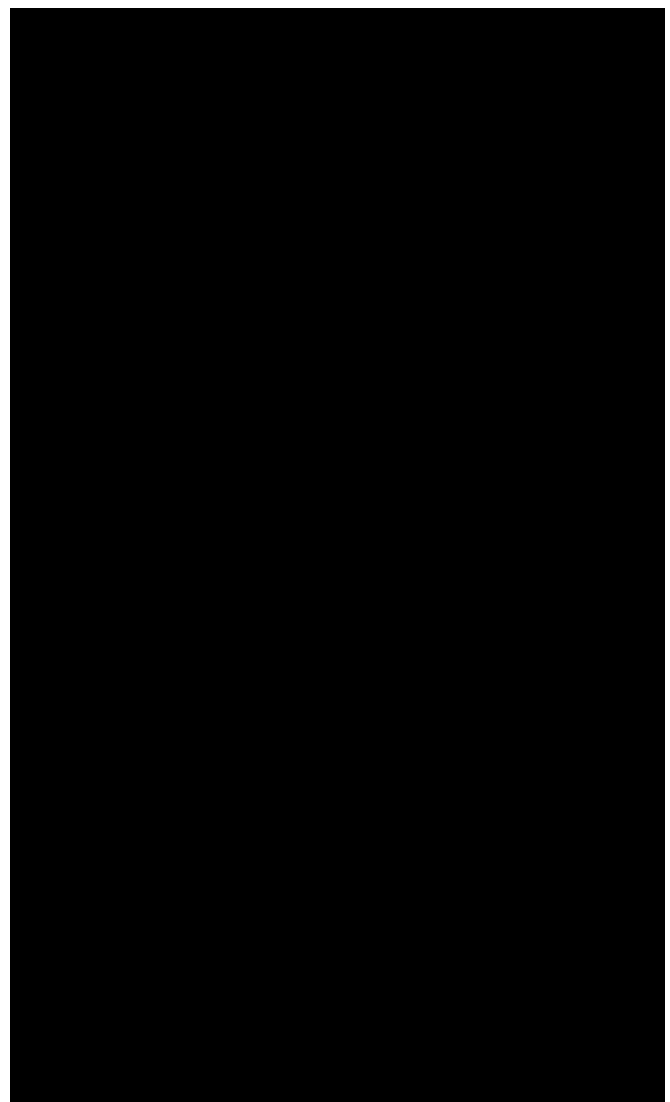


Figure 3. Plan view of Plainview burial at 14SC301 with stippling that reflects presumed size of pit (adapted from Gunnerson 1969:Figure 1). Scale unknown.

cussion of the site's background and the University of Iowa (UI) work to date can be found in Trabert et al. (herein).

EXCAVATIONS OF THE HUMAN BURIAL AT 14SC409

In 2009 KATP investigations at 14SC409 uncovered a rock cluster, subsequently referred to as Feature 4, but time constraints did not allow full excavation of the feature. Feature 4 was described as a scatter of large (i.e., fist-size to 70 cm long) stacked limestone rocks, which covered a roughly 1 x .63-m area

(Figure 4). The rocks, which likely came from an outcrop approximately 150 m to the south, were first encountered 8–10 cm below ground surface (bgs), and they continued to a depth of 30 cm bgs. All the rocks were removed during the excavation of the feature. Before closing the units, excavators used a small soil probe to explore below the rock layer and recovered three small pieces of bone. Given the lack of evidence (e.g., burning, artifacts, charcoal) associated with the rock, the original excavators questioned whether the feature was of cultural origin (Hoard 2009:66–67).

UI reanalysis of those bone fragments indicated that they are morphologically similar to human rib and vertebrae fragments, although their small size necessitated cautious identification. The UI investigations of 14SC409 in 2013 and 2014 were specifically focused on investigating Feature 4, which the authors believed to be humanly produced but of unknown function. The excavation block was 2 x 3 m and positioned so that Feature 4 was at the center of the excavation grid. Excavations revealed that the feature was larger (1.4 x 1.1 m) than previously thought. While most of the limestone rocks were stacked several courses high, many rocks along the margins of the pit had long axes that clearly sloped toward the center of the feature, leaving them sticking vertically out of the ground after exposure (Figure 4). None of the rocks associated with this feature, either from the KATP back dirt or newly exposed UI excavations, showed evidence of thermal alteration, and no charcoal or burned earth was observed in the feature fill.

Not until 2014 did excavation within the feature itself begin. At that time a large bone was encountered at approximately 47 cm bgs (Figure 4). With only minimal exposure of the bone, key diagnostic features of a human cranium, such as the supra-orbital notch, external auditory meatus, squamosal suture, and coronal suture, were recognized. The descriptions concerning the nature and size of the cranial features were made with the assistance of UI physical anthropologist Dr. Robert Franciscus. In accordance with the Kansas Unmarked Burial Sites Preservation Act (KSA 75-2741 through 75-2754), excavations at the site stopped immediately, and the local law enforcement agency (i.e., the sheriff's department) was notified. The Kansas Historical Society was notified of the discovery by contact-

ing State Archeologist and chair of the Unmarked Burial Sites (UBS) Preservation Board, Dr. Robert J. Hoard. Following consultations with Dr. Hoard and the UBS Preservation Board, it was decided that all work at the site would cease. The feature was reburied and preserved in place with no further disturbance planned.

The requirement to cease excavation resulted in a very limited understanding of this burial and makes inferences about associated burial practices quite difficult. However, uncovering the cranium in association with the pit feature supports a few reliable statements. First, while it is not possible to know if the burial includes an entire skeleton or only the skull, it was clear that the skull is lying on its left side with its face orientated to the southwest. The cranium's orientation (anterior-lateral skyward) is what could be expected of the inhumation of a body in a crouched or flexed position. Had it been a prone burial, excavation would have exposed the back of the skull rather than the side, and an extended burial most likely would result in the face oriented skyward. Second, the estimated straight-line distance between the top of the cranium and the southwestern pit edge is approximately 77 cm. A human body in a tightly-couched position could be placed in this pit if oriented northeast-southwest. The pit also extends an additional 50 to 55 cm north of the burial, and it appears that the rock feature was built large enough to accommodate a second individual or grave goods (Figure 4). Finally, as the top of the rock feature begins approximately 8–10 cm bgs, it is very likely that the top of the pit was roughly at the same level as the main concentration of buried artifacts at the site. While rodent activity and other factors appear to have vertically displaced some artifacts, the densest concentration of artifacts was found between 10 and 20 cm below the surface (Hill and Trabert 2014). Assuming that the densest artifact concentration represents the original occupation surface, the top of this feature was roughly at the ground surface at the time of its construction. This would place the burial stratigraphically contemporaneous with the archeological occupation of the site.

In conclusion, investigation of the 14SC409 burial offers some intriguing glimpses into burial practices but gives rise to many more questions than answers. Given that ethical and legal issues

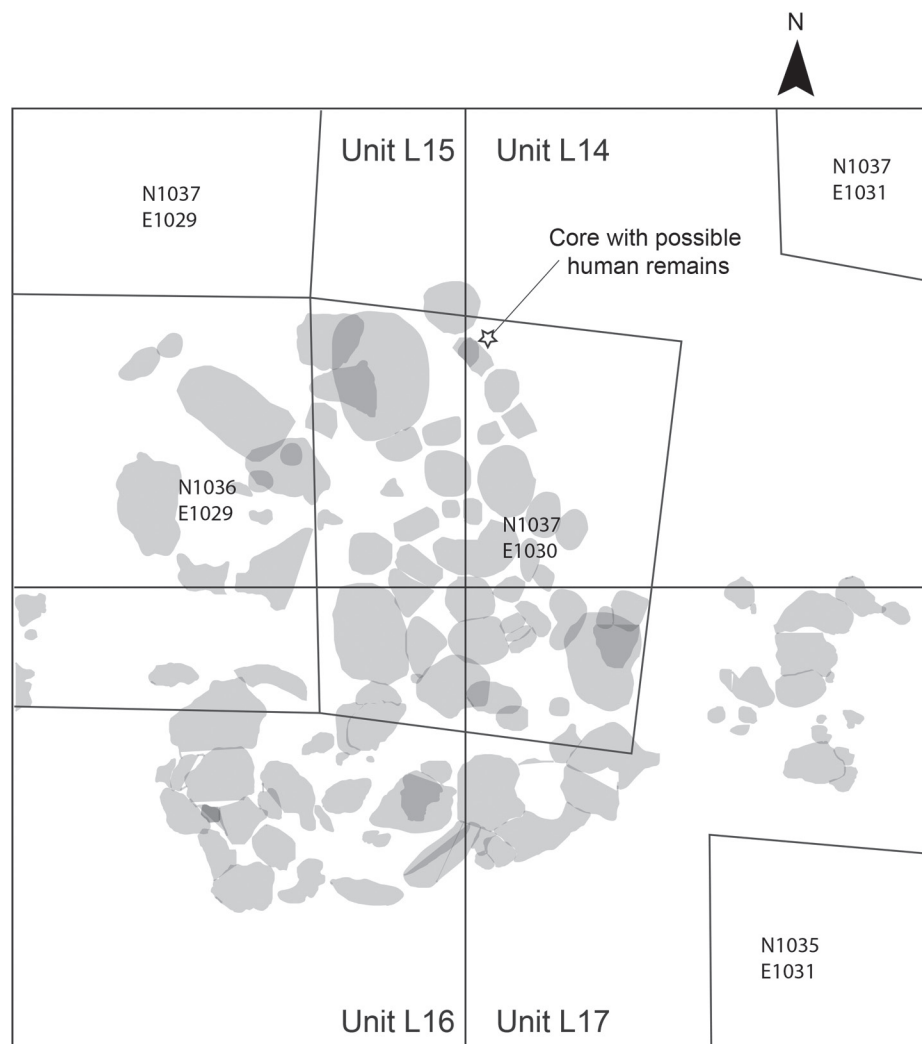


Figure 4. Reconstructed feature 4, showing rocks removed by KATP and rocks still in place during UI excavations. Star represents location of KATP core with possible human remains.

eliminate the capacity to continue excavation, few options are left to make reliable inferences about the burial or the mortuary practices of the site's occupants. However, a review of ethnographic and archeological data for contemporaneous Puebloan burial practices in northern New Mexico and information on the mortuary behavior of Athapaskan-speaking groups can assist in better understanding the mortuary behavior exhibited at 14SC409.

COMPARISON OF DISMAL RIVER BURIALS

The two burials found at sites near Lake Scott, while not identical, do share some similarities. The 14SC301 individual was placed in a previously used baking pit and inhumed in a tightly flexed position,

lying on his right side, with his head oriented to the north and facing west. A large stone was placed over the baking pit, and no artifacts were recovered with the individual. Less information is known about the 14SC409 burial, but the individual (or at least its cranium) was placed in a pit. It is strongly suspected that the body was placed in a flexed position with its head oriented to the east and facing south. This pit was then covered with a large quantity of rocks from nearby bluffs. Both individuals were buried in pits, in tightly flexed positions, with rocks covering the opening, near Dismal River campsites. The individuals' bodies were likely oriented in different directions; however, there is little information to suggest that orientation of the body was culturally significant.

COMPARATIVE BURIAL PRACTICES

While many cultures may share some elements of mortuary behavior, factors specific to each group (e.g., belief systems, mobility, the environment, etc.) lead to variation in burial practices (Carr 1995). This is true for groups of people living on the Central High Plains during the late Prehistoric and early Historic periods, for Athapaskan-speaking peoples, and for Puebloan peoples living along the northern Rio Grande. Dismal River groups may have interacted with and been influenced by a number of roughly contemporary peoples, and the mortuary practices of the Pawnee, Wichita, Apache, and Northern Rio Grande Puebloans bear consideration.

The mortuary practices and beliefs of individual groups often remain distinct even after centuries of interactions and exchange (Brugge 1978; Hester 1962; Kidder 1958). Groups like the Jicarilla Apache and Navajo retained many elements of their mortuary beliefs and practices despite decades and often centuries of interaction with Puebloan people in northern New Mexico (Brugge 1978:310–312; Eiselt 2006:29). Burial practices have been targeted for analysis by ethnographers and archeologists because they often remain conservative and retain traditional elements even after hundreds of years of colonial and assimilation pressures (Jamieson 1995; Shaffer 2005). Ethnographic coverage of indigenous groups in North America is not even, however, and details regarding mortuary practices vary. While ethnographies from nineteenth- and twentieth-century Pawnee and Athapaskan-speaking groups provide a rich record detailing burial practices, similar information on mortuary practices for other groups, such as post-A.D. 1500 Puebloans, is limited.

CENTRAL HIGH PLAINS GROUPS

The Central High Plains was occupied during the Late Prehistoric period (A.D. 900–1450) by a number of groups, classified by archeologists into the Central Plains tradition (CPT) (Steinacher and Carlson 1998). While these peoples likely are not contemporaneous with later Dismal River groups, the variation exhibited in their mortuary behaviors highlights the range of practices present in the region prior to the Dismal River occupation. Mortu-

ary practices include primary and secondary burials, group burials, individual burials, different positions and orientations, and within- and without-site burials. For example, Kivett and Metcalf (1997:157–158) described Upper Republican burials recovered in the Medicine Creek Reservoir, Nebraska. Ossuary burials are a distinguishing characteristic of most Upper Republican groups (Strong 1935), and Kivett and Metcalf (1997) reported that disarticulated and fragmentary human remains were found in middens, on house floors, and in pits. In contrast other CPT groups, such as Nebraska phase people at the Doniphan site (14DP2), buried their dead in small groups with individuals lying in supine positions, covered with large limestone slabs (Wedel 1959:669–672).

Later Pawnee mortuary practices varied considerably from earlier CPT behaviors, and Echo-Hawk (1992) used ethnographic data and interviews with his own family members to summarize common burial practices shared by all four bands of the Pawnee. Burials generally took place the same day or immediately after death. A grave was excavated (sometimes half a meter to a meter deep), and the individual was laid inside in a supine position along with a variety of personal objects. Poles were erected on either end of the grave, and grass and dirt were piled on top so that the grave resembled a small house or mound. Traditionally, the Pawnee buried their dead in cemeteries on hilltops or ridges overlooking their towns. In his discussion of the excavation of Pawnee sites, Wedel (1936:91–94) stated that burials were almost invariably on the highest hills near the villages, that individuals were placed in graves covered in soil, and that many were interred with mortuary offerings, including flints and steel, glass beads, lead rings, shell gorgets, and an assortment of European goods.

Ethnographic accounts of the Wichita, a Caddo group living on the Central and Southern Plains, present a similar set of burial practices. Yarrow (1881) described individuals buried in graves approximately 1 m deep that were long enough to accommodate an extended body. The deceased was laid in the grave along with personal items, such as a bow and arrows or firearm for men or cooking vessels for women. The body was then covered with sticks and grass, and soil was placed over the covering (Orser and Mackay 1983; Yarrow 1881).

PUEBLOAN MORTUARY PRACTICES

While Dismal River groups were likely influenced by their exchange with Plains groups, they also were tied into broader networks that connected them to Puebloan peoples living in northern New Mexico. One key location for Plains-Pueblo exchange was at Pecos Pueblo in northern New Mexico. Alfred Kidder's excavations at Pecos in the early twentieth century provides the most detailed information for northern Rio Grande Puebloan mortuary practices after A.D. 1500. His 1938 excavations uncovered hundreds of human burials within and just outside of the walls of the pueblo, and many were located in midden areas (Kidder 1958). Most of these burials were in small shallow graves just large enough to accommodate a flexed or bundled body, and all were located very close to living areas. Kidder (1958) noted a lack of Christian influences on the mortuary practices throughout the northern Rio Grande pueblos and burial traditions that continued despite persistent Spanish conversion efforts.

Brugge (1978) stated that Puebloan people were concerned with the welfare of the departing soul and did not believe that the living needed to fear retaliation. Therefore, many earlier Puebloan groups consistently buried their dead near active living areas, such as within kivas, under the floors of abandoned rooms, in rubbish deposits, and in talus slopes below houses, such as at Chaco and Mesa Verde sites (Akins 1986; Kidder 1924, 1958). The available literature does not describe any Puebloan pueblo excavating shallow pits for their dead, nor does it appear that placing rocks and brush on top of a grave was common practice for Puebloan groups. However, discussions of Puebloan mortuary practices after A.D. 1500 are rare, and little has been published on archeological studies of mortuary practices for this time.

ATHAPASKAN MORTUARY BELIEFS AND PRACTICES

In contrast to Puebloan groups, many Athapaskan-speaking groups believed that death and the bodies of the deceased were to be feared and that the topic of death was to be avoided (Opler 1941). Athapaskan concerns about death arose from the belief that a person's spirit, referred to as a ghost, was released

at the time of an individual's death. This fear of encountering a ghost led to feelings of dread toward the deceased, as the living needed to consider dark forces until the body was disposed of and the surviving members of the group moved away from the place of death. They believed that, unless the person's spirit quickly traveled to the underworld and remained there, the ghost would do great harm to the living (Brugge 1978; Opler 1983; Opler and Bittle 1961).

The Jicarilla and Lipan Apache believed that the very young and the very old did not release ghosts, but if someone died unexpectedly or in the prime of his/her life, the spirit could become angry and the ghost could pollute and harm the living (Opler 1945, 1959). A ghost was more likely to stay with the living if the body was not promptly disposed of through burial. However, even if the individual was properly buried, ghosts still could return to the death location. The Chiricahua believed that strangers also could be in danger of ghosts if they wandered into an abandoned camp where a death had occurred or if they found the grave. If that person had troubled dreams filled with disturbing apparitions, they could suspect that they were camped near a burial spot (Opler 1941:235).

Significant concern about the dangers brought by ghosts influenced many of the practices and rituals that followed a person's death. To ensure their safety, surviving family members and associates of the deceased responded to a person's death in several prescribed ways. A critical treatment of the dead was a quick internment. Burials always took place on the same day that the person died, or, if an individual died at night, they would be buried the next day; burials never took place after sundown (Lockwood 1938; McAllister 1937; Opler 1941).

The specific method of disposal for the deceased varied among and within cultural groups. The Kiowa, Jicarilla, Lipan, Chiricahua, and Navajo were reported to bury their dead in mountainous or rocky terrain (Hester 1962; Lockwood 1938; McAllister 1937; Opler 1959; Opler and Bittle 1961). Kiowa and Navajo accounts suggested that the burial of the deceased sometimes occurred within his/her home, but these dwellings were then abandoned (Brugge 1978:Table 1). However, the most common burial method apparently was placing the deceased in a rocky crevice or digging a pit and covering the

body with rocks. For example, the Jicarilla and Lipan groups frequently used a natural rock crevice or dug a shallow trench and piled branches, earth, and rocks over the body (Opler 1959). The Kiowa Apache also used natural rock crevices or scooped out shallow graves, laid the body down, and covered the grave with rocks to protect it from animals. Some Navajo groups buried their dead in previously used baking pits with the openings covered by logs or stone slabs (Carlson 1965; Hester 1962).

After the relatives returned to the camp it was necessary to deal with the deceased's belongings. Since the deceased's possessions could pull the ghost back from his/her path to the afterlife and because objects stored memories and held sorrow for the living, all of the deceased's personal possessions were destroyed (McAllister 1937; Opler 1941, 1983). Ethnographers writing about the Kiowa and Chiricahua Apache mentioned that some of the individual's personal belongings might be interred with the deceased, such as a man's shield and weapons or a woman's pottery and baskets. Opler (1945) stated that it was Lipan Apache tradition to kill the dead person's horse at the gravesite. All the other belongings of the deceased, anything worn, used, or owned, including clothing, tools, utensils, tipi pole coverings, and wickiups, often were burned (Lockwood 1938; McAllister 1937; Opler 1941, 1959). Among the Chiricahua, when a woman died, holes were made in that woman's ceramic vessels and/or baskets as the living did not want to use anything associated with that person by mistake (Opler 1941).

Once the objects and structures associated with the deceased were destroyed, many Athapaskan-speaking groups abandoned that camp and moved to a new locality (Lockwood 1938; McAllister 1937; Opler 1941, 1959). Chiricahua groups often burned all the structures in their camps and moved to new places because the relatives did not want to live in a polluted space (Brugge 1978; Opler 1941). Others, such as the Lipan and Navajo, sometimes tried to avoid moving camp following deaths by moving seriously ill and dying people far away from settlements, isolating them until they died. If a death took place within the settlement, the Navajo dismantled the person's dwelling and used materials from the house to cover the deceased; remaining materials were burned (Brugge 1978). The prohibition against occupying the space of the dead was

so strong that even the person's grave site had to be avoided. Once a person was buried, the grave site was rarely, if ever, discussed and seldom visited (McAllister 1937; Opler 1941).

DISCUSSION AND CONCLUSIONS

Our review of the historic literature for Athapaskan mortuary practices yielded a rich record regarding the beliefs, customs, and practices following the death of an individual. Fear of malevolent ghosts encouraged a quick burial, and several Apache groups found nearby rock crevices or excavated shallow pits and laid the individual within (Hester 1962; Lockwood 1938; McAllister 1937; Opler 1959; Opler and Bittle 1961). These pits were covered with rocks and brush to prevent animal activity and to mark the grave. These Apache groups did not revisit these burials and actively avoided the areas (McAllister 1937; Opler 1941). Following burial, the deceased's belongings were burned, the structure where death occurred was destroyed, and the site was abandoned (Lockwood 1938; McAllister 1937; Opler 1941, 1959).

Despite their proximity to and probable contact with other Central Plains groups, the 14SC301 and 14SC409 burials compare favorably with a number of historic accounts of Apachean burial practices. In particular, the placement of the bodies within pits and covering them with rocks are the most direct similarities to Apachean customs that clearly differentiate them from traditional practices of Puebloan or other Central Plains groups. While a sample size of only two makes further comparisons difficult, the Dismal River burials are isolated, placed within the confines of their camps, and contain no grave goods (at least based on the burial at 14SC301). In contrast, other Central Plains practices often incorporate individuals buried in groups (cemeteries), located on hill or bluff tops, and interred with material possessions. Furthermore, 14SC409 was very likely abandoned following the death and burial of the individual, which is not a practice common to more sedentary Puebloan populations, and few Puebloan burials are known to be capped by large quantities of rock and brush. The location of these Dismal River burials also differs in part from Athapaskan practices, as it is more common among many Athapaskan groups to select a burial location outside of the

camp boundaries. In addition, no grave goods were recovered from either Dismal River burial, although the deceased's property may have been present at 14SC409 but could not be excavated.

Despite similarities with Athapaskan mortuary practices, caution must be applied in assigning a firm Apache affiliation to these burials or the people who lived at 14SC301 and 14SC409. As discussed above, the Dismal River sites in Scott County are situated within a complex social landscape of intersecting identities. The dating of 14SC409 to the closing or just after the closing of the pueblo at 14SC1, paired with ceramic evidence that points to locally made copies of Puebloan vessel types, indicates that the site's occupants may have been Plains Apache, Puebloan, or of mixed ethnicity. (For additional information see Beck and Trabert 2014; Beck et al. 2016; Trabert 2015.) The presence of a seven-room pueblo at the neighboring site of 14SC1 and the use of locally produced copies of Puebloan vessels at several Dismal River sites in the region provide evidence for expressions of Puebloan identity, while the mortuary behavior at 14SC301 and 14SC409 point to Athapaskan practices, as affirmed by the ethnographic review above.

The goal of this research was not to provide an ethnic identity for the person buried at this site. Instead, the authors are interested in what the material practices could say about how this group's identity was constructed and expressed in the past. The evidence of Athapaskan mortuary practices, paired with data on local Puebloan architecture and ceramic technology, points to a complex and unique identity for these groups. Migrant Puebloan and indigenous Dismal River groups apparently blended their different practices and belief systems in significant ways, choosing to maintain Athapaskan mortuary traditions and Puebloan technology and foodways. Therefore, those who lived and died at 14SC301 and 14SC409 were very likely neither "Apache" nor "Puebloan," possessing a distinctive identity specific to their community.

The people who lived and died at 14SC409 and other sites during the Protohistoric period were living in a complicated, pluralistic world. Consideration of larger, more complicated social processes is key when burials are excavated and cultural affiliation must be determined. The authors argue that in these situations archeologists must embrace the

complex nature of identity, recognize that people in the past were creative and active participants in the transformation of their social practices, and consider how identity and social boundaries were redefined. Historic documents, especially regarding burial practices, can provide concrete examples of how human behavior makes an impact on the material record. Archeological data can then be re-evaluated to consider whether evidence of culturally specific practices are present, which in turn can lead to a clearer picture of the fluidity and construction of new identities, community composition, and social change.

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INVESTIGATIONS AT 14EL311, ELLIS COUNTY, KANSAS: PRESUMED LOCATION OF BILLY DIXON'S WHISKY RANCH

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The 2013 Kansas Archeology Training Program field school investigated a site south of Hays, Kansas, which was considered a prospect for the location of the short-lived road ranch, established by buffalo hunter Billy Dixon around 1870. Despite extensive metal detection, block excavation, and artifact analysis, no firm conclusion could be drawn about the use of 14EL311.

PREFACE

Interrupted by the Civil War, the American industrial revolution literally was gaining steam between 1866 and 1880. The era was dominated by new technologies in manufacturing and agriculture. Railroad construction enabled the rapid expansion of westward immigration, while advances in communications technology and business models developed new and expanding markets into the frontier interior of North America.

New industrial and agricultural machines required additional resources, including leather products, to turn the wheels of industry. In the late fall of 1871, an experimental leather tanning process was perfected by a New York tannery, instigating an order for bison hides from the High Plains. John Mooar, a young businessman and entrepreneur, contracted his brother J. Wright Mooar, who was already on the Kansas plains, to provide 200 bison hides to the New York tannery (Branch 1929). With the initial success of that small contract, an additional contract was initialized with Charlie Rath in Dodge City via W. C. Lobenstein of Lawrence, Kansas, for an additional 2,000 hides. Unable to complete the contract on his own, Rath contracted J. Wright Mooar (2005) to assemble a bison hunting party. These seemingly minor events, nestled within the greater scope of the Industrial Revolution and the settlement of the West, began a chain reaction that in a few short years completely decimated the once great bison herds and changed the cultural and environmental landscape of the Plains forever

(Branch 1929; Hornaday 1889; Isenberg 2000; Taylor 2011).

From antiquity, humans hunted bison on the High Plains, using almost the entirety of the animal for food, clothing, shelter, tools, and weapons. Many Native American tribes integrated their relationship with the bison into almost every aspect of their cultures (Dodge 1866; Gard 1959). Described as subsistence hunting or harvesting, early Euro-American explorers and settlers used bison in many of the same ways. With post-Civil War railroad expansion, followed closely by Euro-American settlers and the United States military, professional hunters under contract to provide meat to the railroads and the military appeared on the Plains (McChristian 1995; Miner 1986; Ward 1996). While still a form of subsistence hunting, the dynamics began to change.

As a result of the new demand for leather products and a developing market for bison hides, a new cast of characters emerged, mostly young disenfranchised men from the East, searching for opportunity and adventure. These men took advantage of the market, hoping to make at least small fortunes and establish themselves in the new High Plains societies. The practice could be referred to as market or hide hunting or, better stated, hide harvesting. No longer was every part of the bison used for subsistence. Harvesting required only hides, prime or not, to be secured and transferred to market via the nearest collection point along the railroads.

The transition from subsistence to market hunting was rapid. After the initial east coast orders for

bison hides, a flood of buffalo-hunting teams entered the High Plains. Among those already there was William “Billy” Dixon. After being orphaned at a young age, Dixon moved to Independence, Missouri, during the Civil War. There he began a career as a wood cutter and freight hauler that eventually led him to Hays City, Kansas, where he contracted to haul freight and provide meat to the Army along the trail to Fort Hays, Fort Dodge, and Camp Supply (Dixon 1927:Chapter IV).

In 1869 Dixon, in partnership with his associate Billy Reynolds, constructed and opened a road ranch south of Hays City to provide supplies to freight haulers, hunters, settlers, and anyone else using the Military Trail (Figure 1). In November 1871, after an extended hunting trip along Hackberry Creek and delayed by a deadly blizzard, Dixon returned to his road ranch to find it abandoned with all the contents gone and no sign of Billy Reynolds. Shortly thereafter, probably in the spring 1872, Dixon returned to open range hunting along the Smoky Hill, Solomon, and Saline rivers. That fall he was in the Dodge City area, where he met and hunted with Bat Masterson (DeArment 1979; Figure 2). Working out of Dodge, Dixon also made the acquaintance of fellow buffalo hunters, the Mooars and the Nixons, which began a series of events that in June 1874 culminated in the Battle of Adobe Walls, a confron-

tation between the hunters and Comanche Indians at a former trading post in the Texas panhandle (Baker and Harrison 1986; Haley 1976).

Investigations at 14EL311 sought to determine if that archeological site, a series of dugouts and a historic material debris scatter, represents the location of Dixon’s and Reynolds’ Whisky Ranch, the 1869–1871 trading post.

INTRODUCTION

Sometime in the spring of 1869, Billy Dixon and his partner Billy Reynolds began operating a road ranch and supply store along an unnamed creek on the Military Trail south of Hays City, Kansas, just north of the Smoky Hill River. Whisky Ranch, as the place became known, was an entrepreneurial venture by Dixon to take advantage of the increasing freight traffic between Fort Hays and Fort Dodge, as well as to supply and outfit the influx of buffalo hunters entering the area to exploit the rapidly expanding market for bison meat and hides (Wright 1913).

Billy Dixon was born in Ohio County, Virginia (now West Virginia), on September 25, 1850, of a European father and Native American mother (Dixon 1927:7). Alternatively, the 1870 census lists his birth year as 1848. Orphaned at age 12, Dixon



Figure 1. Artist’s depiction of Dixon’s Whisky Ranch. Illustrator Clay Renick is director of the Hutchinson County Historical Museum, Borger, Texas.

traveled to Ray County, Missouri, in the Kansas City area to live with his uncle Thomas Dixon. At age 13 he began working for wood cutters along the Missouri River and became intensely interested in the West. In October 1864 Dixon witnessed the Battle of Westport. In the spring of 1865, at age 15, he began working as a freight hauler between Fort Leavenworth and Fort Scott (Dixon 1927: Chapter II).

Late in 1865 Dixon made his first excursion onto the High Plains. As a bullwhacker with a group of teamsters out of Fort Leavenworth, his travels extended westward along the Platte River on what would become the general route of the Union Pacific Railroad. The job took him to Fort Collins, Colorado, and back, and along the way he encountered Native Americans and bison for the first

time. Dixon continued hauling freight privately and for the Army, beginning operations between Fort Harker and Fort Hays in 1867. During a supply expedition supporting the Army, Dixon witnessed the signing of the Medicine Lodge Peace Treaty in fall 1867 (Dixon 1927: Chapter III).

In November 1868, as part of a supply train to Camp Supply supporting Custer's 7th Cavalry operations against the Southern Cheyenne under Black Kettle, Dixon worked with and became friends with Billy Reynolds, a mule driver. Returning to Fort Hays, Dixon continued to cut wood and hunt, supplying wood and meat to the Army, while selling furs and hides to buyers in Hays City (Dixon 1927: Chapter IV). As freight business increased along the Military Trail between Fort Hays and Fort Dodge and southward to Camp Supply, Dixon and



Figure 2. Billy Dixon (lower left), Bat Masterson (back row middle) and other buffalo hunters were photographed at Fort Elliot, Texas, in 1876. Photograph courtesy of Hutchinson County Historical Museum.

Reynolds decided to take advantage of the situation by opening a road ranch along the route about a day's ride south of Hays City.

Based upon a description of the site in Dixon's memoir, amateur and vocational archeologists began metal detector surveys of the area in the 1990s that produced a variety of period artifacts. During the winter of 2012–2013, the Ellis County Historical Museum (ECHM) staff solicited estimates and bids for a formal excavation of the presumed Billy Dixon Whisky Ranch site. Finding the cost of private company excavation prohibitive, they contacted the Kansas Historical Society (KSHS) to determine if the site could be a candidate for the Kansas Archeology Training Program (KATP) field school, an annual event sponsored by the KSHS and Kansas Anthropological Association (KAA). After a site visit in December 2012, KSHS and ECHM staff determined that the site, designated as 14EL311, would be the location of the 2013 KATP field school. Shortly afterward Steven Roberts was selected as principal investigator (PI), and work began on developing a research design and excavation plan for the field school.

Historic site 14EL311 provided an opportunity to investigate the material culture and lifeway of the 1870s High Plains buffalo hunters and the general culture of the area. Clearly a major research emphasis was to determine if the site was Billy Dixon's Whisky Ranch. The research also focused on two primary domains: historic, collecting the background information on Dixon and the buffalo-hunter phenomenon of the 1870s, and cultural (archeological), describing the cultural dynamics of the time within the historic framework, incorporating the social and economic environments. The research design was developed around the following questions:

- Does 14EL311 represent the Billy Dixon trading post of 1869–1871?
- Based on material culture, what was life like?
- What was the general lifeway of European-American buffalo hunters? Did they constitute a distinct subculture of the American West?
- How do the dugouts of the site compare to others in the Central and Southern Plains?
- How did advances in technology influence the buffalo-hunter lifeway and market?

Excavations of 14EL311 were conducted between June 1 and 15, 2013 (Figure 3). Over the 16-day period 140 volunteers, including 57 first-time participants, donated more than 6,100 hours of time to field operations and lab work and classes at facilities provided by Fort Hays State University (FHSU). The following report, prepared for the KSHS and KAA, contains the results and findings of the project. This article attempts to answer the research questions and to further describe and define the buffalo-hunting culture and era on the High Plains in the mid-nineteenth century.

The research and fieldwork has been extensive and as complete as possible; however, the results clearly demonstrate that much more can be done. The era of the buffalo hunters was a transitional part of the development of the West that has been sorely neglected and warrants more academic and archeological attention; the work at 14EL311 and the associated research and analysis represents only a beginning.

ENVIRONMENTAL SETTING

Ellis County in north-central Kansas is divided between two physiographic regions: the Smoky Hills to the east and the High Plains to the west. The Smoky Hills are upland rolling hills, delineated by outcrops of Cretaceous-age rocks and covered by tallgrass and mixed-grass prairie, while the High Plains are vast flatlands and gently rolling hills, broken by streams and river valleys (Kansas Geological Survey 1999). Soils consist of poorly sorted clay, silt, sand, and gravel, comprised of siliceous and calcareous minerals cemented together by calcium carbonate or caliche (Zabriskie 2007). Sub-surface water and springs are part of the Ogallala Aquifer that underlies most of western Kansas. The semi-arid plains contain a wide diversity of fauna and flora. Most of the prairie lands are used for cattle range with interruptions of grain agriculture.

The area immediately surrounding 14EL311 consists of unremarkable topography with low rolling hills with developed drainages, running generally from north to south and terminating at the Smoky Hill River. The site is located along an unnamed drainage north of the Smoky Hill River approximately 10 miles (16 km) south of Hays (Figure 4). It is situated on a slightly sloping, east-facing



Figure 3. Excavations at 14EL311 started with removal of sod from 2 x 2-m units.

terrace above a small creek. It overlooks an alluvial flood plain to the east and is surrounded by nominal ridges to the north and south. At the landowner's request, the exact site location has been withheld.

Soils at 14EL311 generally correspond with the Armo, Eltree, and Roxbury series, contained within the Roxbury-Eltree-Hord association that contains deep, nearly level to strongly sloping, well-drained soils that have a loam to silty clay loam subsoil on flood plains, stream terraces, and valley sides (Glover et al. 1975:2–3; Figures 5 and 6). Upland soils to the immediate south of the site contain Eltree silt loam soils, while the alluvial flood plain to the east has a very deep layer of Roxbury silt loam. Aeolian and alluvial events over time created a substantial overburden in the post-occupation depressions of the major features. The area has been subjected to major flood events (Figure 7) and was

inundated with fine windblown deposits during the Dust Bowl era.

In the 1940s and again in the 1950s, the immediate area was quarried for sand and gravel. A previous landowner, who had worked on the site as a teenager in the 1940s, pointed out that there had been a number of constantly running springs along the west bank of the creek associated with the site. Soil matrices are consistent with alluvial processes, containing small pedons of clay mixed with silt and sand. In the same conversation the informant mentioned that, at the time of the quarrying, there were no indications of any remnants or ruins of dugouts F461 and F411 (Jim Dinges, personal communication June 2013).

In the previous decade the current landowner constructed a check dam immediately upstream from the site, creating a small reservoir and altering

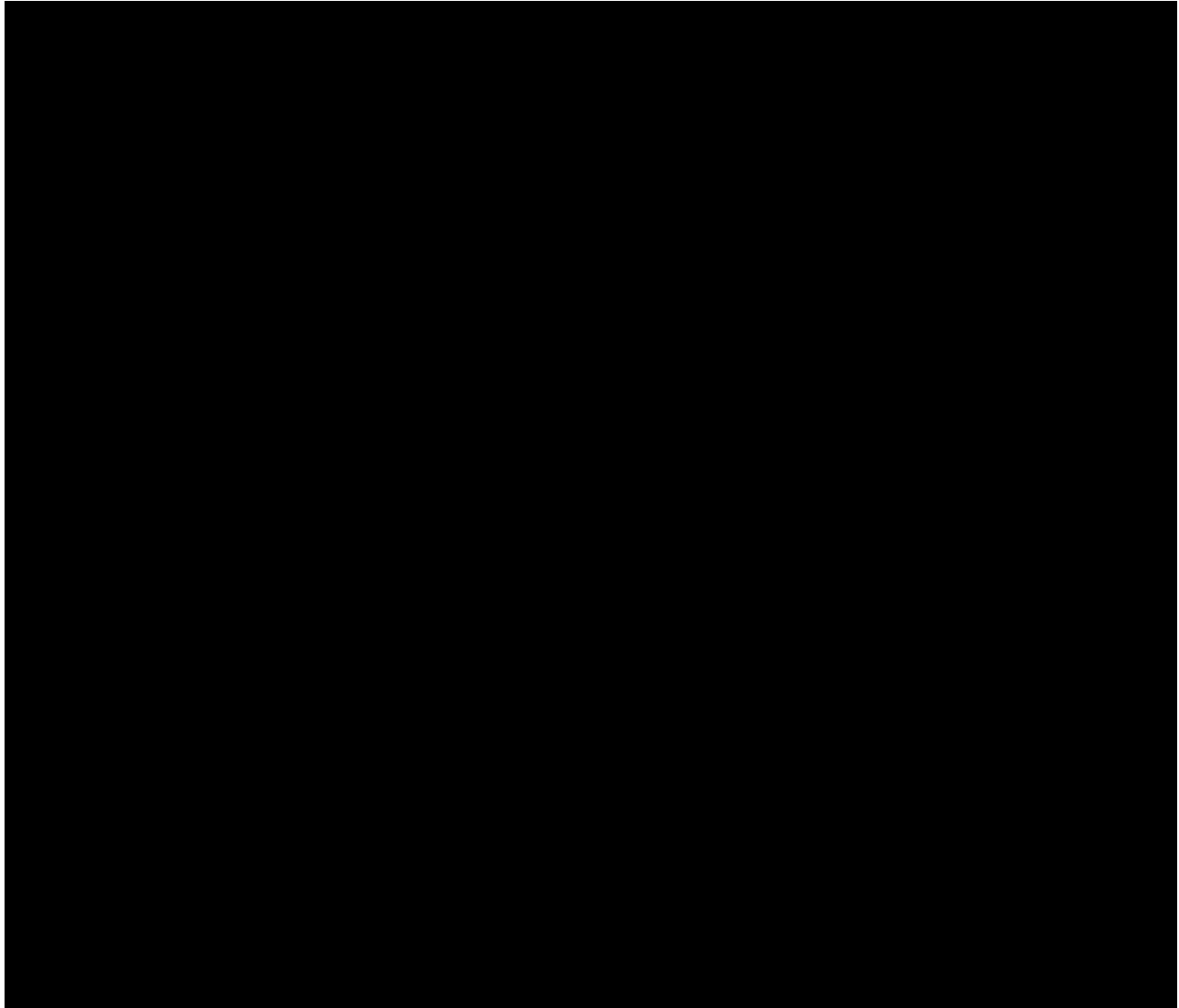


Figure 4. Site 14EL311 is located along an unnamed tributary of the Smoky Hill River. Photograph by the Natural Resources Conservation Service in 2011.



Figure 5. Area soils consist of poorly sorted clay, silt, sand, and gravel.



Figure 6. Profile of the north wall of F461 revealed soils consistent with the Armo loam series.

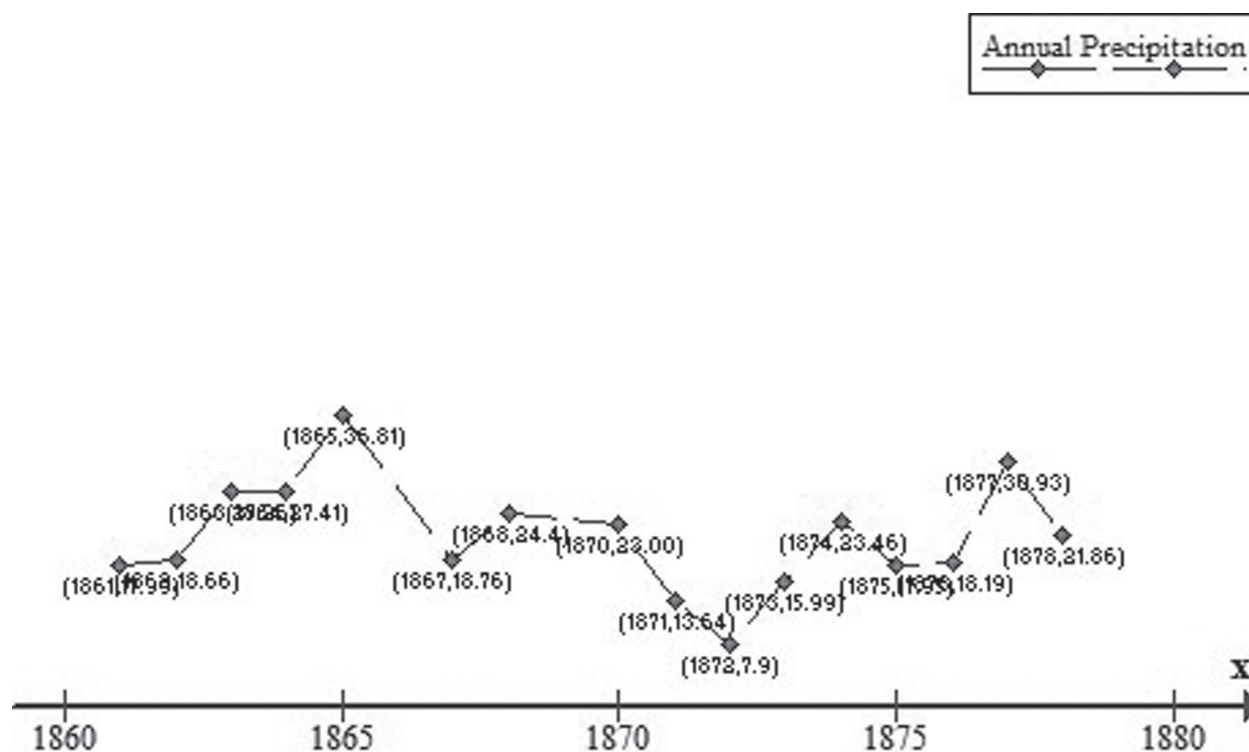


Figure 7. Annual precipitation at Fort Larned varied significantly during the 1860–1880 period. Data courtesy of Fort Larned State Historic Site.

the natural flow and actions of the stream adjacent to the primary features. In 1951 the U.S. Bureau of Reclamation completed construction of Cedar Bluff Reservoir about 17.7 miles (28.5 km) upstream on the Smoky Hill River west of the site. The landowner (personal communication 2013) stated that, when the Bureau of Reclamation releases water from the reservoir, water once again flows from a number of the old springs.

Considering quarrying activities, irrigation pressures, drainage modifications, and a recent sustained drought, it is safe to presume that contemporary drainage and sub-surface water patterns no longer resemble those of the presumed Dixon occupation from 1869–1871. This would explain the minimal percolation of water in auger tests conducted in F466.

Vegetation is determined not only by lack of rainfall, but also by type and depth of soil, which consists

of loess, as in much of the High Plains. Little other than prairie grasses and cacti grow here in a natural state. Various types of short prairie grasses cover the land, such as little bluestem (*Schizachyrium scoparium*), buffalo grass (*Buchloe dactyloides*), side-oats grama (*Bouteloua curtipendula*), blue grama (*Bouteloua gracilis*), and prairie threeawn (*Aristida oligantha*). Wildflowers are abundant, blanketing the prairie with a rainbow of colors in the spring and fall. Many flowers are common in gardens around Kansas, such as black-Sampson echinacea (*Echinacea angustifolia*), butterfly milkweed (*Asclepias tuberosa*), prairie wild rose (*Rosa arkansana*), and prairie spurge (*Chamaesyce missurica*) (Haddock 2005; Zabriskie 2007). The immediate area of the site has been pasture for many years and was covered with sand plum and other forbs at the time of the KATP field school (Figure 8).

Before Euro-American exploration and later set-



Figure 8. For many years 14EL311 has been in a tame grass pasture.

tlement of western Kansas, ash, elm, cottonwood, and willow trees were found along creeks and rivers and on alluvial bottoms. While Native Americans used wood in a number of applications, such as fuel, structure poles, and tools, their populations were low enough that the demand seldom exceeded the supply. With the westward expansion of the railroads, followed closely by the Army and settlers, wood became a much sought-after commodity. In the off season (winter) many of the early settlers, including buffalo hunters, cut wood for construction members, fence posts, and fuel and sold it to the railroad or the Army. William Dixon's occupation is listed as a wood cutter in the 1870 U.S. census of Ellis County, and in his 1872 diary Henry H. Raymond wrote that he and his friend Bat Master-son cut fence posts and sold them in Wichita (Snell 1965:358). By 1870 the majority of usable trees had been harvested along the major streams and rivers in

the area, leaving behind a generally denuded landscape. When the Volga Germans entered the area and began farming around 1875, most construction wood had to be shipped in, making it an expensive commodity. The lack of trees in the area was one of the driving forces behind constructing fences with quarried limestone posts or post rocks.

During the mid-nineteenth century the High Plains were practically stripped of their native forests. Today a narrow overstory of elm and willow trees dominates river banks and drainages. A historic understory of buffalo and grama grasses has been replaced by cover grasses and invasive species. The environmental setting of 14EL311 is typical of the Kansas High Plains (Figure 9). Decades of farming, grazing, irrigation, and drainage alterations have transformed the environment to an extent that native species may no longer be sustainable.



Figure 9. Modern environmental setting of 14EL311 consists of cover grasses and invasive species.

FIELD METHODS

The site was prepared by removing brush, weeds, and any other obstacles or hazards. A permanent datum was established on an elevated spot and designated with the last three digits of its UTM coordinates (e.g., N560 E362). Once established, a total station was used to construct a standard 2 x 2-m grid throughout the survey and excavation areas. The survey area was divided into selected areas of interest (AOI) that cover more than 40,000 m² (Figure 10): AOI-1—northern extent of the metal detector survey area; AOI-2—area immediately surrounding the primary site features; AOI-3—primary metal detector focus area either side of the old Military Trail; and AOI-4—selected sampling area in the alluvial floodplain opposite the main site features.

Under the general direction of the PI and supervision of the KSHS project coordinator, assigned crew chiefs divided participants into excavation and metal-detection teams. Prior to excavations, metal detectors were used to locate any surface or near sub-surface artifacts or anomalies (Figure 11). Pin

flags were used to mark artifact locations for excavation and mapping (Figure 12).

Block excavations were conducted using standard methods established for the KATP field school, with horizontal and vertical control within the grid maintained by the total station. Individual excavation unit corners were marked with metal spikes, and excavators left 10-cm pedestals around these spikes. Each square was named according to the northing and easting of the grid point (e.g., N640 E 420) of its southwest corner spike. This spike, identified with flagging tape, was also the unit datum from which elevations were measured.

Excavation proceeded in 10-cm levels, stopping when a dugout floor was encountered. Fill was dry screened through quarter-inch mesh hardware cloth. Upon encountering culturally sterile soil, the 10-cm level was completed, and soil core probes were sunk into the four corners and the middle of the unit floor to check for earlier cultural deposits. Each unit corner pedestal was removed and dry screened as a single entity. Profiles of one or more walls were drawn when each unit was completely excavated. A

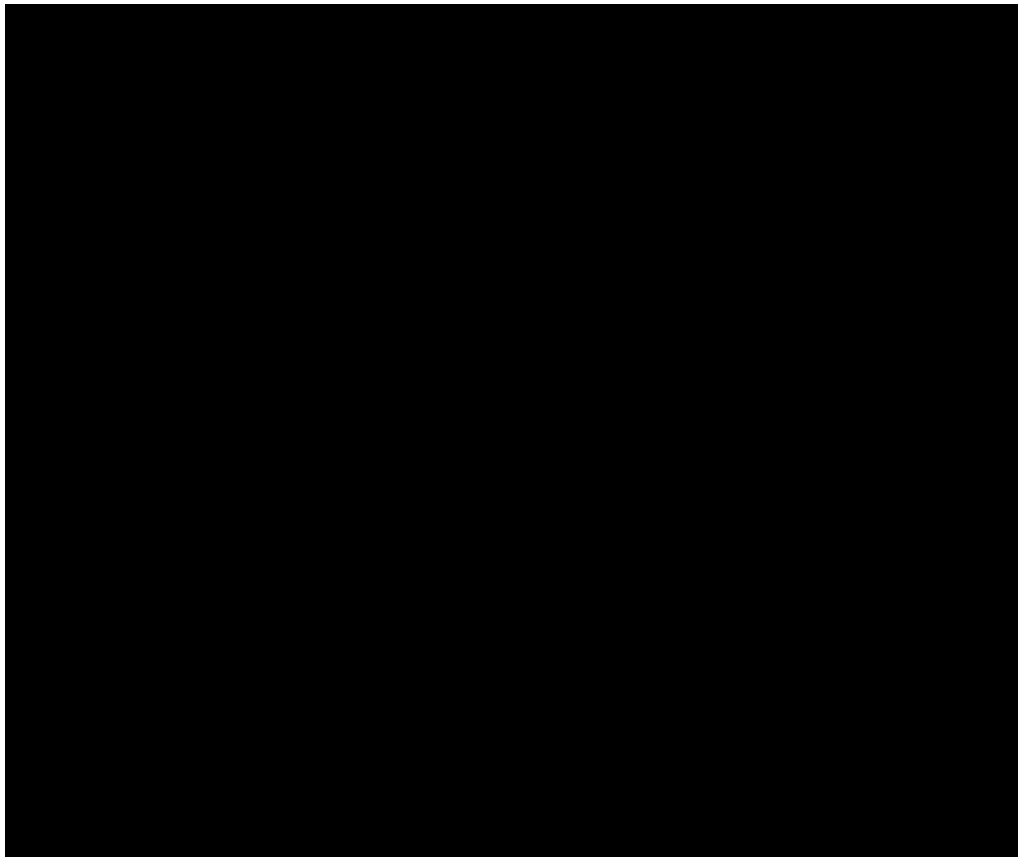


Figure 10. Four areas of interest were delineated at 14EL311.



Figure 11. Metal detector teams located, identified, photographed, and recorded the locations of more than 400 artifacts.



Figure 12. Pin flags marked the locations of artifacts discovered by metal detector crews.

cross trench of 2 x 2-m units was excavated in the same manner. Once the units in the trenches were excavated and profiles of the suspected dugouts recorded, additional 2 x 2-m units were opened in a checkerboard pattern outside of the trenches. Unremarkable and not-in-situ artifacts were collected in general level bags. At the floor of each 10-cm level, excavators completed a Unit Level Form. Excavation units were hand mapped, with piece plots and unit features recorded by the total station and referenced to the established grid. All vertical measurements were referenced below the primary datum.

During excavation of the structural features, interior features and major artifact concentrations were identified and assigned feature numbers. All features, excavation units, piece plots, and general items of interest were photographed with standard digital cameras and recorded in a daily photo log.

Collected artifacts were bagged and labeled and transported to the field lab at FHSU. Under the direction of the KSHS lab archeologist, field school participants cleaned, identified, and developed an artifact catalog. All artifacts, field records, and other pertinent data were later transferred to the KSHS in Topeka.

At the conclusion of the field school, excavation units were covered with about 10 cm of sand to facilitate future investigations before backfilling with original soils (Figures 13 and 14).

At the request of, and in agreement with, the current landowner, exact site location and other potentially sensitive information have been omitted from this and other published reports and documents. Complete and detailed site data, records, and artifact catalogs are curated at the KSHS and are available upon request to qualified researchers.



Figure 13. Excavation units were backfilled with a layer of sand, covered by original soils.



Figure 14. Norman Dye spread the sand layer in Structure 2.

MAJOR FEATURES AND AREAS OF INTEREST

The main site covers an area of about 190 m². Three structural components consist of two dugouts—one large (Structure 1, F461) and one small (Structure 2, F411)—and F466, a feature of uncertain function. These features are closely spaced along the west bank of the creek, with their long axes aligned from west to east (Figure 15). Participants in the KATP field school excavated and screened approximately 75 m³ of sometimes very hard-to-dig soil.

DUGOUTS

Defining a dugout is a bit like defining a hamburger; there are some basic elements, but beyond that are dozens of considerations and variations. In essence a dugout can be defined as any modification of the

earth that provides shelter or safety, but usually the term refers to a semi-subterranean structure built for the purpose of sheltering people or storing things. Dugouts are structures of necessity and convenience, usually not intended for long-term habitation. As such, their construction was ad-hoc at best, using whatever materials and tools were available. “The form varies widely, depending on the goals of the builder and the availability of raw materials, specifically the roofing material” (Powell 2014:13).

The dugout tradition seems to have been brought to America by European colonists, although some Native American groups employed semi-subterranean structures. “Dugouts are especially useful in treeless environments but were not limited to such places; they are known historically in New England and the Great Lakes area” (Powell 2014:14).

As a result of the Homestead Act of 1862, new in-

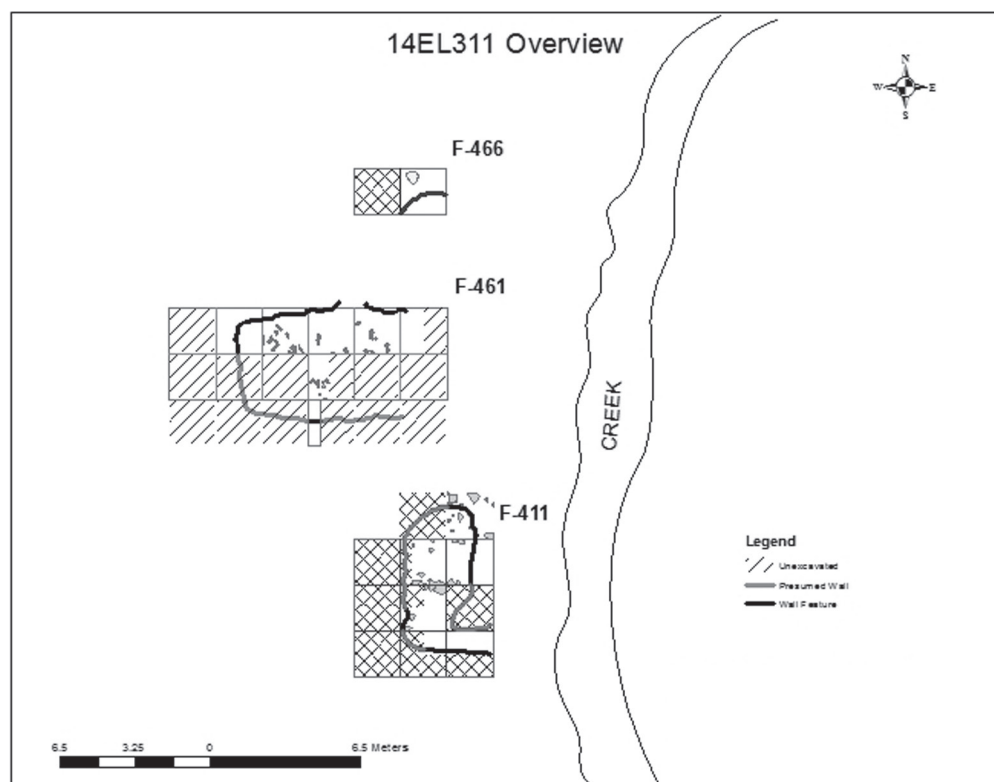


Figure 15. Overview of excavations at 14EL311 is illustrated.

habitants flooded onto the Great Plains, and a great many used dugouts in one form or another. Many extended families came to the Plains and established themselves as farmers and ranchers, often having relatives claim adjacent 160-acre tracts. Pioneers used dugouts as temporary homes (Figure 16), while fulfilling the law's residency requirements by building more permanent structures. Many dugouts were built into the cutbanks of rivers or creeks. Once excavated, a single front wall was usually constructed from available materials; in most cases on the prairie and plains, this was sod, cut into bricks. A good example from 1892 in Custer County, Nebraska, is posted at http://tesellefamily.org/history-of-the-dutch-settlement-in-lancaster-county-nebraska/dugout_on_the_south_loup_river_near_virge_allen_homestead_custer_county_nebraska/. Many original homestead dugouts were subsequently used as storm shelters and storage cellars.

The army used dugouts for temporary troop housing, and railroad workers constructed dugouts along the line as temporary shelters from storms and Indian attacks. Buffalo hunters used dugouts as base camps and storage facilities for hunting operations (Figure 17). "Here we decided to make our perma-

nent camp for the winter, so we built a picket house and a big dugout . . ." (Dixon 1927:63). They usually constructed their dugout camps into the bank of a stream, arroyo, or river, or in some cases the side of a hill (Figure 18).

The Homestead Act was followed closely by the Railroad Act. Extensive tracts of land west of the Missouri River were opened to settlers and land speculators. Any U.S. citizen or intended citizen who had never borne arms against the U.S. government could file an application and lay claim to 160 acres of surveyed government land. One of the few stipulations was that the claimant had to show occupation and some modest improvements for five years (National Archives 1997). Regional and local land offices were established to handle the new claims. These forwarded necessary paperwork to the General Land Office (GLO) in Washington, D.C., along with a final certificate of eligibility. Each case file was examined, and valid claims were granted patent to the land free and clear, except for a small registration fee.

Satellite and on-the-ground investigations of areas immediately adjacent to 14EL311 indicate the possible presence of numerous dugouts along the



Figure 16. "A number of sod dugouts and log cabins were scattered here and there, most of them along the river and creek, the dugouts scarcely visible above the level of the ground" (Ise 1936:4). Photograph courtesy of Kansas Historical Society, Kansas Memory #216856, www.kansasmemory.org.



Figure 17. Typical buffalo hunter dugout was photographed along the Kansas Pacific Railway near Sheridan in western Kansas in 1870. It was a common practice to construct a temporary structure to serve as a basecamp. Note how the dugout is recessed into the creek bank, a technique similar to that used for F411. Photograph courtesy of Kansas Historical Society, Kansas Memory #374, www.kansasmemory.org.



Figure 18. Bearded figure in the doorway of the background photograph is thought to be J. Wright Mooar (inset portrait) with other hunters on the Llano Estacado in Texas in the late 1870s. Photographs courtesy of Hutchinson County Historical Museum.

major creeks and drainages. Without excavation, and sometimes even with excavation, it is difficult to distinguish a buffalo hunter dugout from one used by early settlers. The artifact assemblages are almost identical, as they contain readily available items in common use. The majority of nineteenth-century dugouts had common amenities, usually elevated beds, a cooking area, and, if large enough, storage and dining areas (Ise 1936).

Answering the research question, “How do the dugouts at 14EL311 compare to others in the Central and Southern Plains?” remains problematic. While dugouts do have some common attributes, quantifying them into any meaningful categories is a serious challenge.

STRUCTURE 1 (F461)

Structure 1 is the remnant of a 10 x 6-m dugout, constructed in an excavated portion of the creek bank (Figure 19). It had limestone rock walls and an ash log supporting structure. During the KATP field school approximately half of the feature was excavated and recorded (Figure 20).

F461 may be evidence of the picket house that Dixon (1927:63) described as part of the road ranch.

We moved south of Hays City about ten miles and came to a boiling spring that flowed from an opening in solid rock. Here we decided to make our permanent camp for the winter, so we built a picket

house and a big dugout, expecting to dry a lot of buffalo meat for market . . .

Picket or pole construction was widely used in the nineteenth century and usually used locally available materials. Picket house construction followed techniques similar to stockades; walls were built from poles, obtained from trees 10–15 feet high, installed vertically (Figure 1). Similar to modern-day wood privacy fences, picket walls were tied together with horizontal support poles. The walls were then fastened by a beam running the center length of the structure with stringer or support beams extending laterally from the center to the outer walls. Additional pickets or poles were added to construct a roof. Cracks between the poles were generally filled with mud, clay, sod, adobe, or any other material that was at hand or could be made from available materials.

Calling into question the interpretation of F461 as a picket house was the lack of evidence of upright wall members. However, the pickets might have been removed before the structure was destroyed or, considering the relatively fragile materials contained in picket walls, the pickets simply might have decayed.

Limestone blocks used in the construction of Structure 1 (Figure 21) might have been collected from the limestone outcrop along the creek. North and west walls had collapsed, and F461 showed

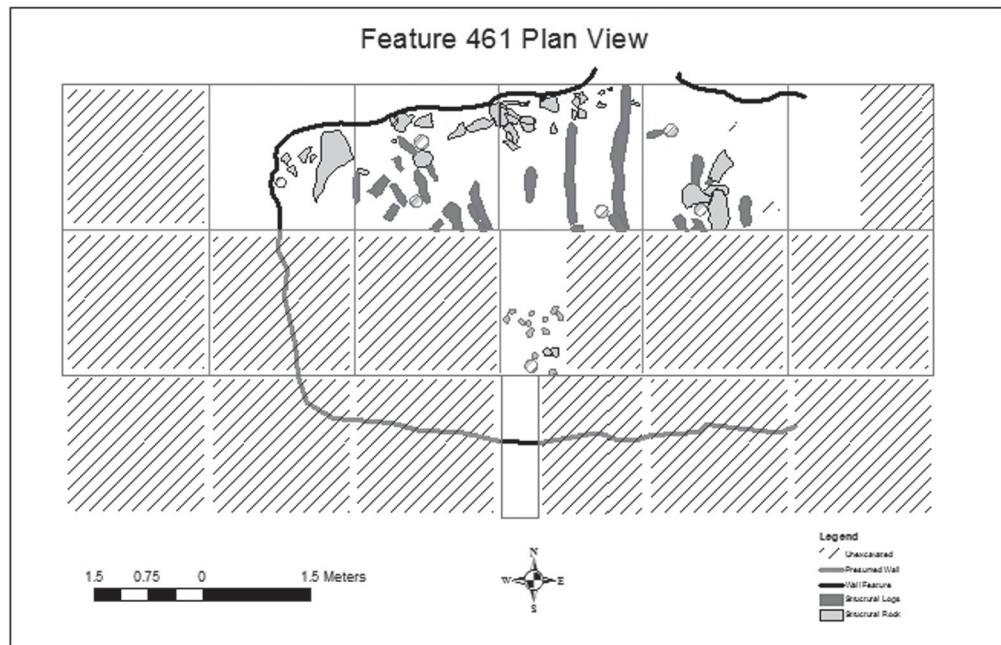




Figure 21. Structural rocks (F506) were exposed in the west end of F461. Photograph by Kent Sallee.

evidence of having been burned (Figures 22 and 23). Who burned it, when, and why remain a mystery.

STRUCTURE 2 (F411)

Structure 2 is a 5 x 3-m dugout, also constructed into the creek bank (Figure 24). Both Structures 1 and 2 face east with their west walls almost flush with the previously existing surface. Excavation of F411 revealed unconventional and somewhat perplexing construction (Figure 25).

F416 (Figure 26) within F411 had several potential uses, including a spring house, cold storage, very small water well, hiding place for valuables, and inclement weather chamber pot. A rock wall dividing the dugout into north and south sections may represent a modification long after the supposed

Dixon occupation (Figure 27). KATP participants excavated about two-thirds of F411 (Figure 28).

F466

F466 is a small feature about 3 m north of the east end of Structure 1 with what appears to be a connecting path between the two (Figure 29). Deep (approximately 1 m in depth) auger tests in the feature produced a soil matrix consistent with that found in association with a spring. The auger hole partially filled with water over a 48-hour period, indicating some ground water percolation (Figure 30).

F466 might coincide with one of the springs that flowed from the east side of Whisky Ranch. However, the feature is somewhat problematic in that it does not fit Dixon's description. Its proximity to Structure 1—possibly Dixon's picket house—and



Figure 22. Limestone blocks mark collapsed north and west walls in F461. Note the lateral support beam in the center foreground. Photograph by Byron Strom.



Figure 23. Burned timbers in Structure 1 were recorded as F506. Photograph by Byron Strom.

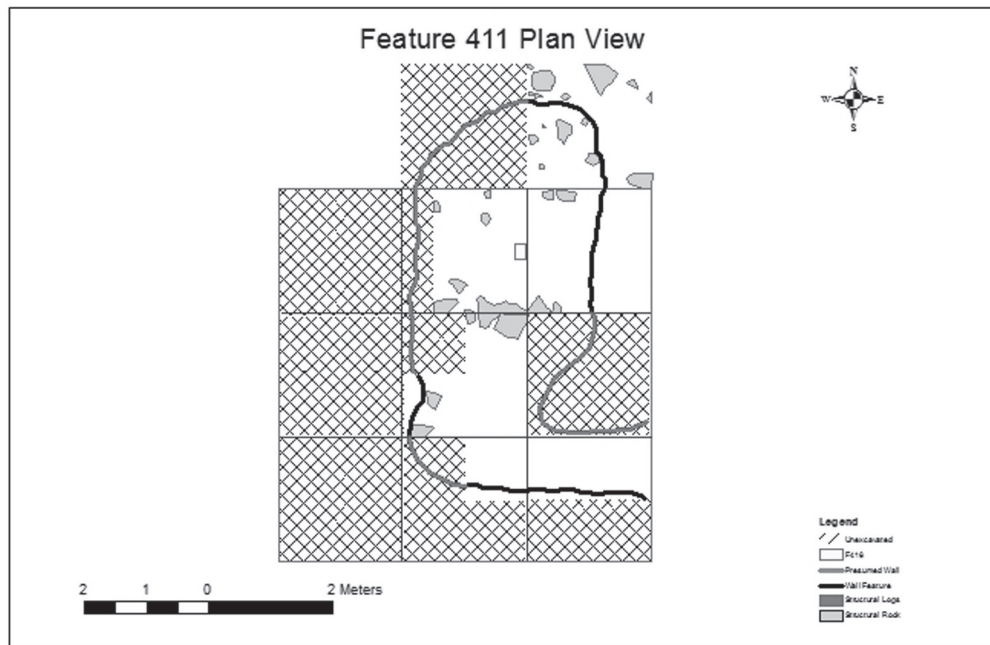


Figure 24. Structure 2 (F411) is illustrated in plan view.



Figure 25. Complex configuration of F411 presented a challenge for KATP excavators and recorders.



Figure 26. Function of F416 ("mystery hole") in F411 is unknown.



Figure 27. Rock wall divided F411 into north and south sections.



Figure 28. Crew members posed in the completed excavation of F411. Photograph by Byron Strom.

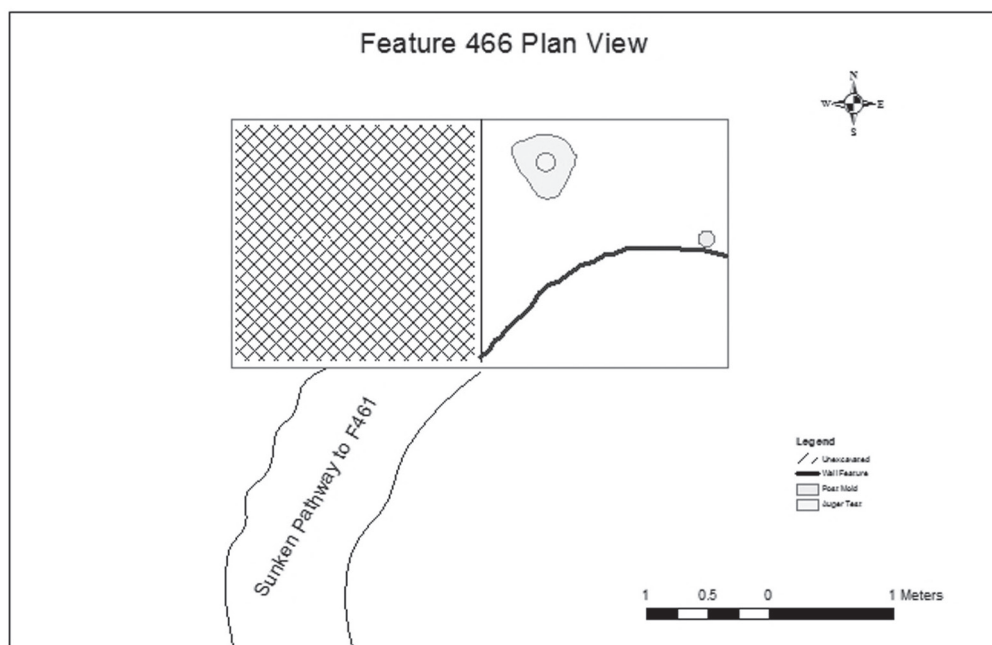


Figure 29. F466 plan view illustrates wall and interior features.



Figure 30. Auger test was placed in F466.

the connecting pathway hint that there might have been a small spring house in that location. However, excavations did not reveal significant rock of any sort.

Possibly limestone that once existed in association with F466 may have eroded out during flood events, been removed in the original construction of Structures 1 and 2, or may have been removed by later quarrying activities. Approximately 250 m downstream of the site and on the cut bank about 300 m to the east, limestone outcroppings that could be described as solid rock still occur.

AREAS OF INTEREST

Associated with the structural components at 14EL311 are four extramural AOIs (Figure 10) that encompass a 490 x 75-m strip along and either side

of the adjacent creek, covering more than 41,200 m² and containing a variety of period associated artifacts and materials.

The extramural AOIs were investigated using metal detectors on a controlled grid. These areas appear to have been used for activities associated with ranching and trading operations. Artifacts discovered 3–15 cm below surface included metal scrap, tin cans, cartridge casings, horseshoes, picket pins, nails, and remnants of horse tack.

ARTIFACT ANALYSIS

Excavations at 14EL311 produced well over 900 near-surface and sub-surface artifacts with strap metal, cans, and nails representing the vast majority (Figure 31). The artifacts initially were cleaned and cataloged in the KATP field lab at FHSU, follow-

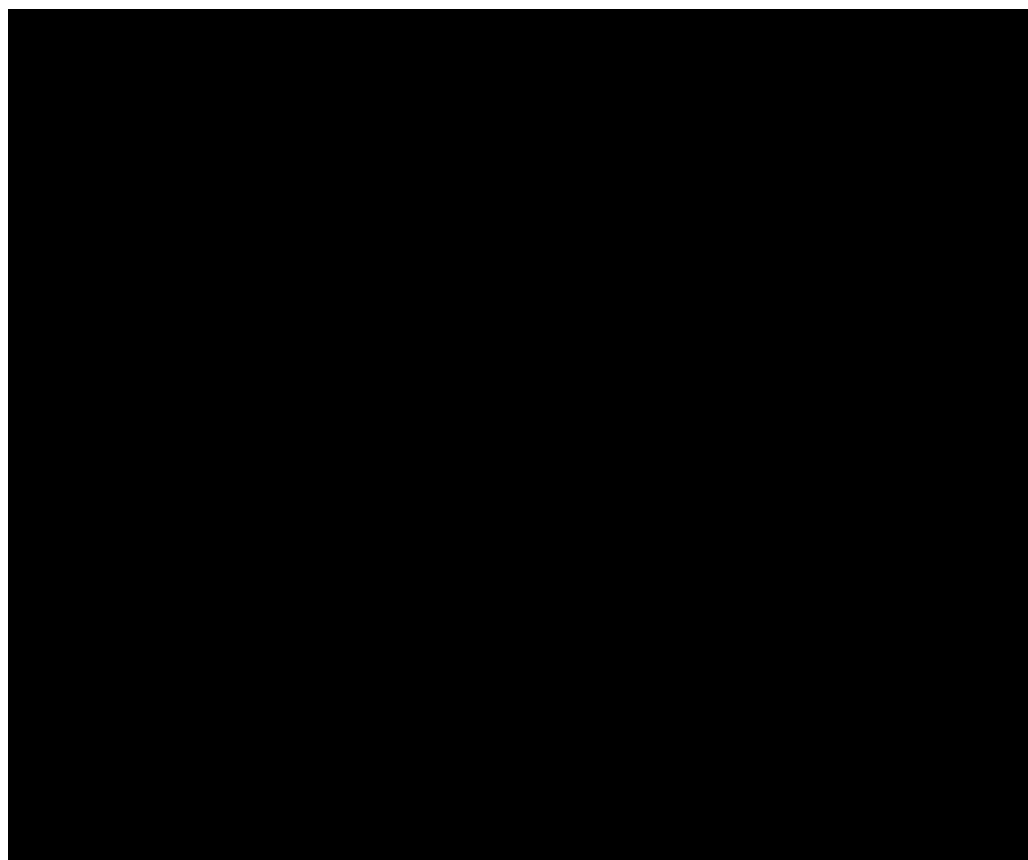


Figure 31.
Combined artifact
distribution is
illustrated.

ing standard protocols. During the post-excavation analysis phase of the project, some liberties were taken to organize the artifacts into more general categories while maintaining the KSHS dataset. A complete artifact catalog is on file at the KSHS Archeology Office in Topeka.

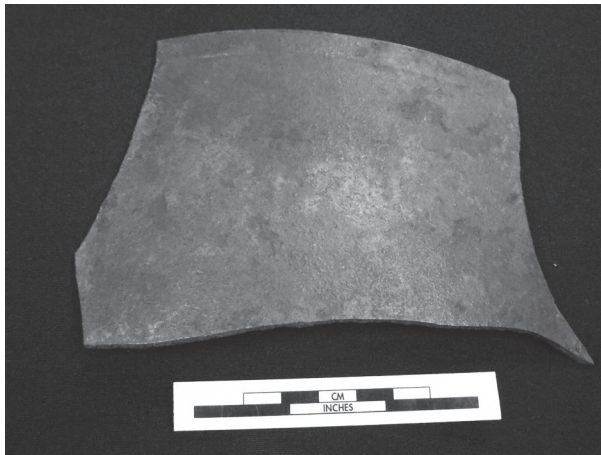
The artifact assemblage was divided into five general categories: Category 1—commissary items, including food stuffs, canned goods, eating utensils, cooking items, and miscellaneous items associated with subsistence; Category 2—livestock items, including horse tack and livestock shoes; Category 3—infrastructure materials, which are artifacts and other materials associated with the structures, including nails, barrel and keg banding, wood, window glass, and other structural components; Category 4—ammunition associated with buffalo hunters, the military, and later occupants of the site; and Category 5—personal items.

The 14EL311 artifact assemblage indicates that supplies were acquired from a variety of sources. The majority of the artifacts are of a general nature, common throughout the post-Civil War period

until about 1880. With the advent of the railroads, obtaining goods and materials from distant large suppliers became much easier and less expensive. Settlers, hunters, and Native American groups took advantage of a flood of post-war military surplus materials, available on the market via tradesman and outfitters.

CATEGORY 1: COMMISSARY ITEMS

“Freighters and hunters urged me to establish a road ranch or store, where such supplies as were used in that country could be purchased in reasonable quantities” (Dixon 1927:63). Following a pattern established by the U.S. Cavalry during the Civil War, the majority of buffalo hunters traveled with a minimum of tools, equipment, and supplies. The usual compliment of field supplies included “coffee, sugar, salt, blankets, water kegs, a Dutch oven, frying pans, a tin coffee pot, a camp kettle, bread pan, tin cups and plates” (Gilbert 1986:Chapter 3). Cast iron fragments recovered from F461 are possibly the remnants of a Dutch oven, kettle, or stove



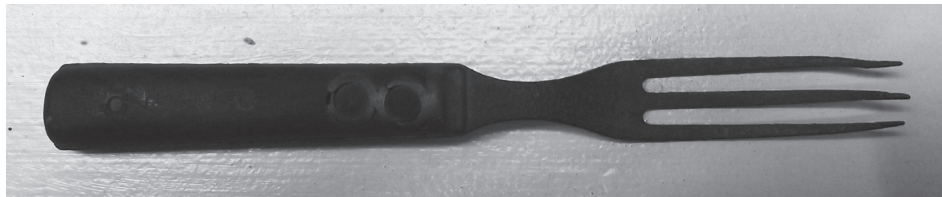
Figures 32a&b. Cast iron fragments (1188-1 recovered by the metal detector survey and 775-1 found in F461) are possible remnants of Dutch ovens.

(Figure 32). Utensils similar to those on exhibit at the Hutchinson County Historical Museum (Figure 33a) and Fort Larned National Historic Site (Figure 34a) are present in the 14EL311 collection (Figures 33b and 34b).

Coffee was considered indispensable and was a much sought-after commodity. Essence of Coffee was developed prior to the Civil War by President Jackson to replace liquor rations to the troops (Figure 35b). During and after the Civil War this type

of “instant” coffee was widely used. Note the holes punched in a lid recovered during the metal detector survey at 14EL311 (Figure 35b).

Canned food was available from suppliers and merchants throughout the High Plains in the post-Civil War period (Figure 36). Early tin cans were sealed with a tin-lead alloy solder, which could lead to lead poisoning. One hundred-eighty-three lead-sealed cans were recorded during field investigations (Figures 37 and 38).



Figures 33a&b. Three-tine fork on display at Hutchinson County Historical Museum corresponds to fork fragment (1111-1), recovered by the 14EL311 metal detector survey.





Figures 34a&b. Tin drinking cup from Fort Larned National Historic Site corresponds to mashed cup (1463-1), recovered by the 14EL311 metal detector survey.



Figures 35a&b. Essence of coffee container from Fort Larned National Historic Site may relate to can lid with shaker holes (1166-1), recovered by the 14EL311 metal detector survey.



Figure 36. Display at Fort Larned National Historic Site features a variety of canned items.

CATEGORY 2: LIVESTOCK ITEMS

Excavations and metal detector survey produced about 40 artifacts associated with livestock, horses, and related activities. Artifact distribution analysis



Figure 37. Mashed hole-in-top can (1442-1) was recovered by the metal detector survey.

suggested that a corral may have been located on the high ground south of the primary features of 14EL311. While possibly indicative of the Dixon occupation period, none of the items were temporally specific. Horse (Figure 39a) and mule shoes (Figure 39b), tack items (Figure 40), and wagon parts are of a general nature and were used over a long period of time from the pre-Civil War period well into the beginning of the twentieth century; they cannot be interpreted unambiguously as evidence of road ranch activities.

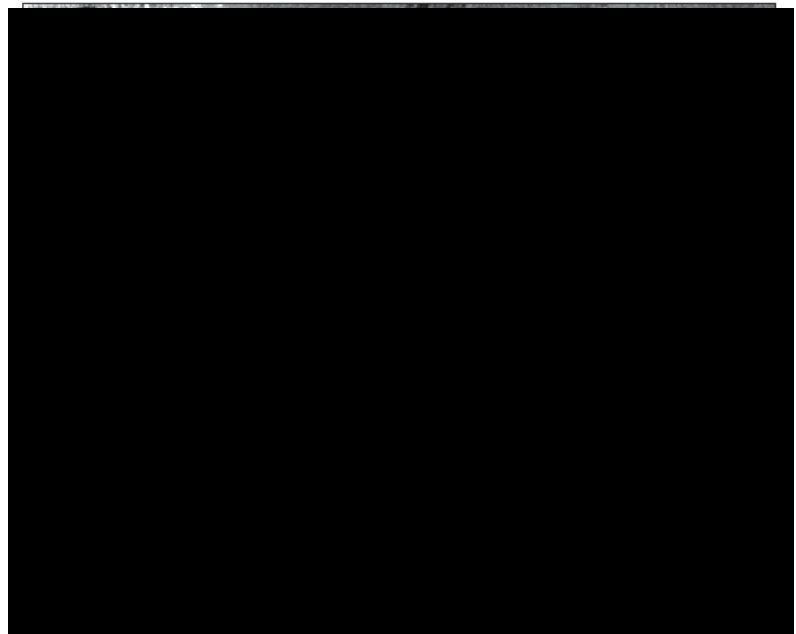
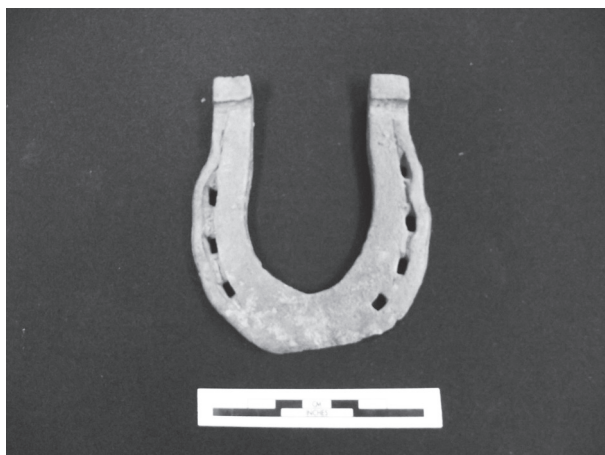


Figure 38. Nail-can-metal distribution across 14EL311 is illustrated.



Figures 39a&b. Typical horseshoe (1234-1) and muleshoe (659-1) were among those recovered by the metal detector survey. Note that the nails are still in place in the muleshoe, indicating that the shoe was removed, possibly during replacement.



Figure 40. Partial picket pin (1206-1) was recovered, oriented vertically, by the metal detector survey.

CATEGORY 3: INFRASTRUCTURE MATERIALS

WOOD

Trees on the western plains are limited to watercourses because of water availability and protection from prairie fire (Moser et al. 2008:14). Thus, wood became a highly valued commodity on the High Plains; harvesting, collecting, chopping, and selling wood was at least a part-time or seasonal profession of many early inhabitants (Figure 41). It is possible that, if 14EL311 is the Whisky Ranch site and F461 were the picket house, the missing pickets

were hauled away when Dixon abandoned the site in early 1872.

Thirty-nine wood specimens, presumed to have been wooden structural members, probably the remnants of supporting and lateral beams and posts or pickets, were collected from F461 (Figures 42 and 43). These were found in situ near the floor of the feature in a pattern that indicated that the wall had burned and collapsed a short time after abandonment. In addition, two wood specimens were collected from F411, where few patterns could be discerned. These samples were analyzed by KSHS archeologist Dr. Gina S. Powell (2013). All but two of the post wood specimens from F461 were identified as ash (*Fraxinus*). The two remaining wood fragments were identified as elm family (*Ulmaceae*) due to the distinctive wavy patterns in their late wood pores.

Of the three species of ash tree native to Kansas, only green ash (*F. pennsylvanica*) grows on the High Plains. Green ash is the most widely distributed ash in the United States because it is highly adaptable, “growing naturally on a range of sites from clay soils subject to frequent flooding and overflow to sandy or silty soils where the amount of available moisture may be limited” (Burns and Honkala 1990:696). In the west it is naturally confined to the bottoms of watercourses but can be cultivated on higher landforms. It is commonly associated with other bottomland trees, such as hackberry, pecan, sycamore, boxelder, cottonwood, willow, and American elm.



Figure 41. Bull train prepares to leave Hays City in 1872. Note the rear wagon loaded with wood. Photograph courtesy of Kansas Historical Society, Kansas Memory #307762, www.kansasmemory.org.



Figure 42. Burned lateral support beam was exposed in situ at 14EL311. Photograph by Kent Sallee.

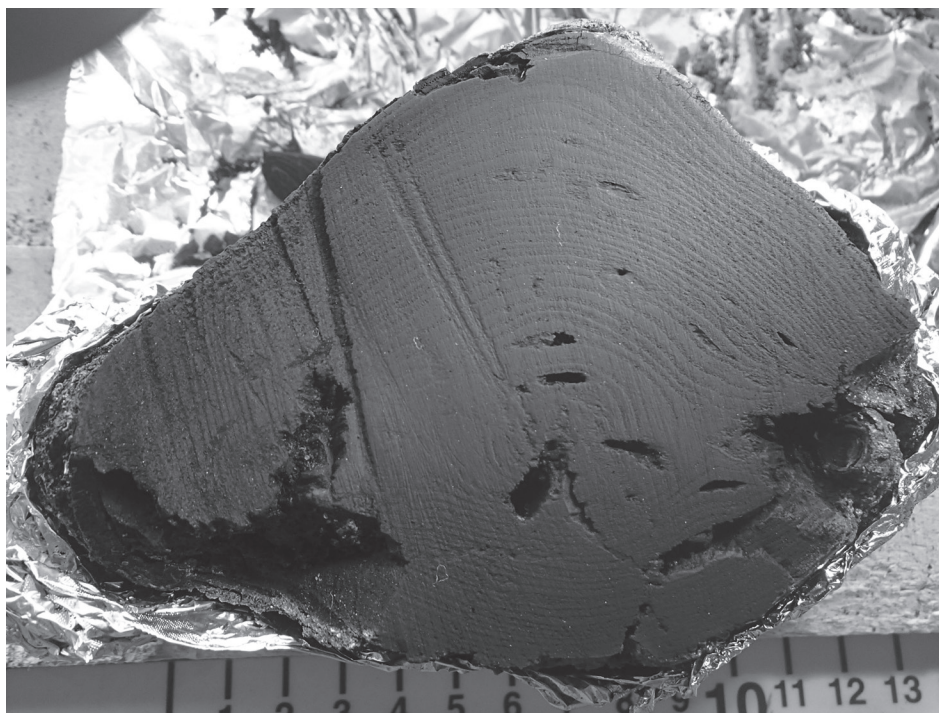


Figure 43. Structural member of F461 was cross sectioned.

Green ash wood is desirable for tool handles due to its strength, hardness, and bending qualities. For the same reasons green ash would have made excellent pickets or posts (Powell 2013).

In June 2013 all of the observed trees in the drainages around 14EL311 were cottonwood and willow, not counting the plum trees that grew within and near the dugouts themselves. Green ash trees are said to have grown along the major streams like the Smoky Hill River, associated with hackberry, elm, maple, cottonwood, boxelder, and black walnut (Kansas State Board of Agriculture 1893:68), so they might have been available locally to the inhabitants in the 1860s and 1870s. Alternatively, the ash and elm posts could have been brought to Whisky Ranch by Dixon and Reynolds. The area has cottonwood trees of significant age, and old barns probably contain support members of native logs. With proper sampling, these might produce a reliable dendrochronology of the local area and a relative date for 14EL311.

METAL

Metal detector surveys, as well as excavations, produced well over 200 fragments of banding strap, keg wire, and miscellaneous scrap iron and metal pieces

(Figure 38). Metal banding and tie wire were used extensively for wooden barrels, kegs, and shipping containers (Figure 44). Freighters, railroads, merchants, and the U.S. Army used these containers for a wide variety of shipping applications, containing everything from eggs to gun powder.

The fragments of banding strap varied in width from ½ inch (12.7 mm) to 1 inch (25.4 mm), typical of wooden shipping container strap used during the second half of the nineteenth century. Keg wire varied from about American Wire Gauge (AWG) #6 to #12 or 4.11 to 2.05 mm in diameter and again is typical of shipping containers during this period.

While it may be possible to gain some temporal information from the banding and wire using spectroscopic techniques, it was not possible to gain any diagnostic data from the collection within the limits of the project.

CATEGORY 4: AMMUNITION

Firearms technology developed dramatically during and in the decade following the Civil War. As buffalo hunting changed from primarily a subsistence activity into an industrial, market-driven profession, military advances in firearms were quickly adopted



Figures 44a&b. Wooden barrels are displayed at Fort Larned National Historic Site.

by hunters on the Great Plains. A significant development was the introduction of the 1865 Springfield .50–70 cartridge.

Buffalo hunters used a wide variety of rifles in their pursuit of buffalo hides. Springfield, Sharps, Remington, Spencer, Winchester, Henry, and a number of other manufacturers' rifles were available. The hunters preferred the knock-down power and range of the large bore, breech-loading, single shot, heavy rifles. Numerous detailed volumes of literature cover the rifles and cartridges used by the military and buffalo hunters during the time period (Barnes 2012), and it would be impossible to do the subject justice in this report. However, a brief description is undertaken here of the most common rifles and cartridges used by the hunters that were most likely present at a road ranch. Photographs of a number of these guns can be viewed by browsing Internet sites, such as the Rock Island Auction Company (www.rockislandauction.com).

During the buffalo-hunting period large bore, single shot, breech-loading rifles employed three fundamental types of breech blocks or breech closure systems. The Springfield Model 1868 was one of several models that used the trapdoor breech-block design, developed by Erskine S. Allin, master armorer of the U.S. Government's Springfield Arsenal. Originally, the trapdoor Springfield was created to convert Model 1863 Springfield rifled muskets to breech-loading rifles at a relatively low cost. This conversion consisted of replacing the breech end of the existing muzzle-loading barrel with the breech-loading trapdoor mechanism and relining the barrels to convert them from .58 to .50 caliber. Over 50,000 Model 1868 rifles were manufactured, chambered for the .50–70 450 cartridge. This model served as the basis for the definitive Model 1873 "Trapdoor Springfield" series of rifles in .45–70-405 caliber, which was adopted in 1873 as the standard military long arm of the United States armed forces for the next 20 years.

In the 1860s and 1870s Remington introduced a number of models of their rolling block sporting rifle, including the Creedmoor variant. Compared to Sharps, Remington rifles were much less expensive, more readily available, but somewhat less prestigious. The Remington rolling block quickly became known as one of the strongest and most reliable ac-

tions of the era. While the U.S. military contracts were small, foreign contracts from dozens of countries poured in. Remington produced more than 1.5 million rifles by the beginning of the twentieth century. The development of repeating arms drastically reduced the military usefulness of the rolling block, but these rifles were still being used by major powers through World War I and by smaller nations long after that.

"Sharps Rifle" is practically synonymous with "buffalo rifle" in Western lore, near-generic in its use to describe the large caliber, heavy barrel, very plain grade, breech-loading rifles commonly employed by professional buffalo hunters during the height of the era, 1867–1882 (Flayderman 2007). Sharps was by far the most sought after and most expensive large bore rifle of the time. Almost all buffalo hunters claimed to have owned a Sharps at one time or another.

Although the .50–70 breech loaders were dominant, based on the cartridge casings found at 14EL311, there was a significant presence of Spencer rifles or carbines. The Spencer was one of the most colorful, widely used, and popular Civil War firearms. After a trial firing demonstration at the Whitehouse, it gained the unique advantage and distinction of the personal endorsement of President Abraham Lincoln (Flayderman 2007). The Spencer was a favorite of General George Custer, early in his service on the Plains. After the Civil War thousands of Spencer rifles and carbines were available to the public through surplus distributors at very affordable prices. While not a true "buffalo gun," thousands of bison were killed with them.

From the earliest Chinese experiments with gun powder packed into bamboo tubes to the modern day, the basic parts and function of cannons, pistols, or rifles has remained the same.

In general, a rifle consists of a barrel with a reinforced portion in the rear (the breech), a mechanism to close or "block" the breech to hold the cartridge in place, and a striking mechanism (the hammer) to ignite the explosive powder inside the cartridge via a pin contained in the block. The Sharps falling block utilized a lever, in this case the trigger guard, in an action that caused the block to drop down parallel to and below the breech, hence the term "falling block." During the same period Remington

introduced the “rolling block” that is directly hand operated; the action rolls the block backward away from the breech with the hammer in the cocked position (Figure 45). Finally, the Springfield Armory via Erskine Allin introduced the “trapdoor” breech block system with the first Allin Conversion in 1865. The trapdoor breech block mechanism was hinged at the top rear of the barrel. It flipped up and away from the breech with the hammer in the cocked position (Figure 46). Although developed and initially produced in 1865, using a .58 caliber metallic cartridge, the rifle was not issued until 1866. The second Allin Conversion, introduced in late 1866, used .50–70 Government cartridges.

Beginning in the 1990s, the 14EL311 area was surveyed periodically by metal detectorists. Approximately 207 cartridge casings were collected and are held privately in the Beougher Collection. Reconstructed location data from that collection was incorporated into the artifact assemblage database for analysis and display.

Excavations at 14EL311 also produced an impressive variety of spent cartridge casings. The assemblage includes .50–70 Government, .56–50 and .56–56 Spencer, .44 Henry/Winchester casings, and a small sample of small rifle and pistol ammunition

that could be dated to the Billy Dixon/buffalo hunter era (Figure 47). Also present and collected were spent shotgun shells (Figure 48) that are dated to post-Dixon activities.

The .50 Spencer and .50–70 Government cartridge casings accounted for about 80 percent of the two collections. Microscopic firing pin and extractor mark analysis indicates that at least four manufacturers’ rifles were represented at the site.

All cartridges have certain components in common: a projectile or bullet, propellant or powder, and an ignition device, usually a primer (Figure 49). All rifles and most handguns use a similar firing mechanism or configuration: a breech or chamber to hold the cartridge, a firing pin to impact the ignition device (primer), and a hammer to drive the firing pin. The International Ammunition Association, Inc. has an ammunition glossary on its web site at www.cartridgecollectors.org/?page=glossary.

Center-fire cartridges use either internal or external primers. Rim-fire cartridges contain primer material inside the rim of the casing with the firing pin striking from the side or on the rim as opposed to the center of the head or base of the cartridge. After a cartridge has been fired, the firing pin and empty case extractor leave marks that are distinctive to the

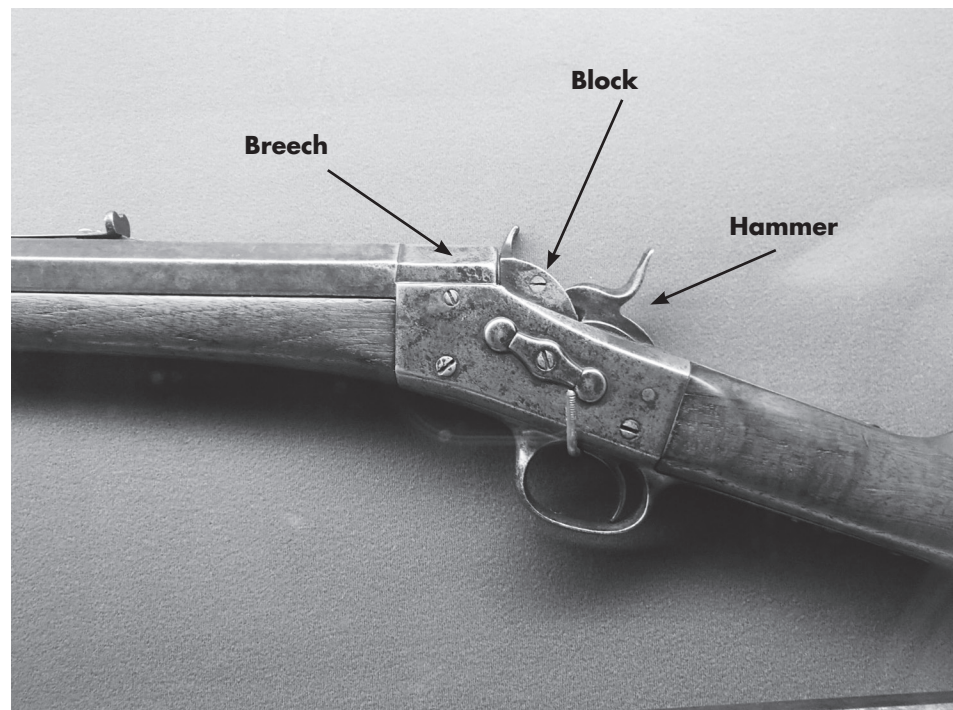


Figure 45. Parts of a Remington rolling block rifle are labeled. Photograph by Ellis County Historical Museum.

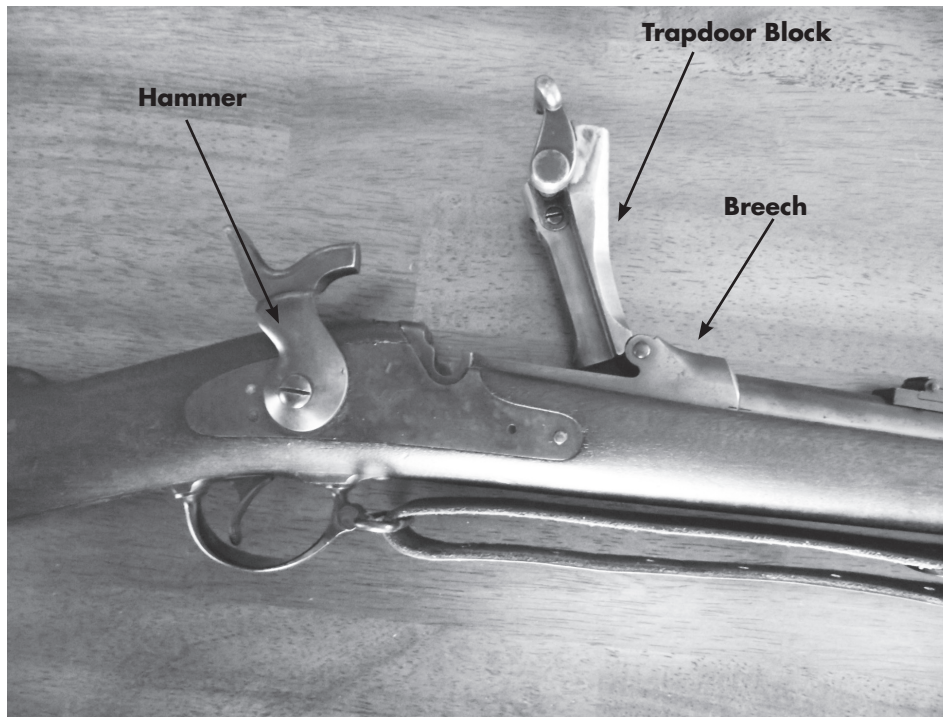


Figure 46. Parts of a Springfield trapdoor breech block are labeled.

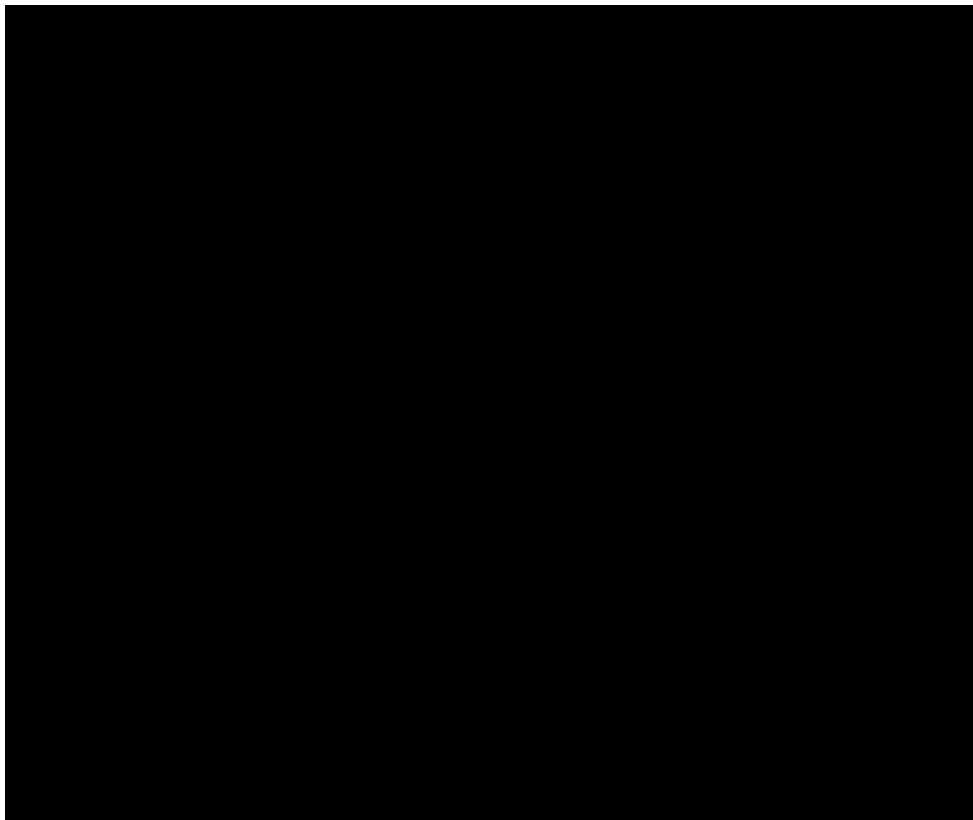


Figure 47. Rifle casings distribution across 14EL311 is illustrated.

Figure 48. Shotgun shell distribution across 14EL311 is illustrated.

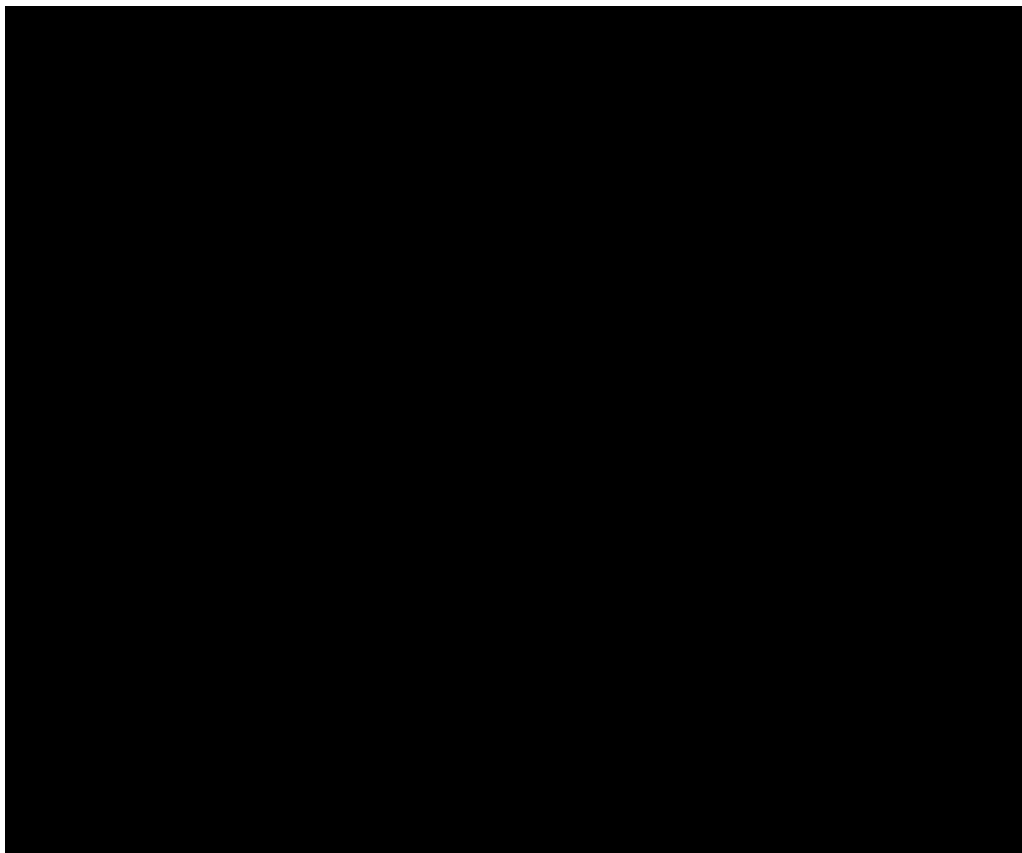
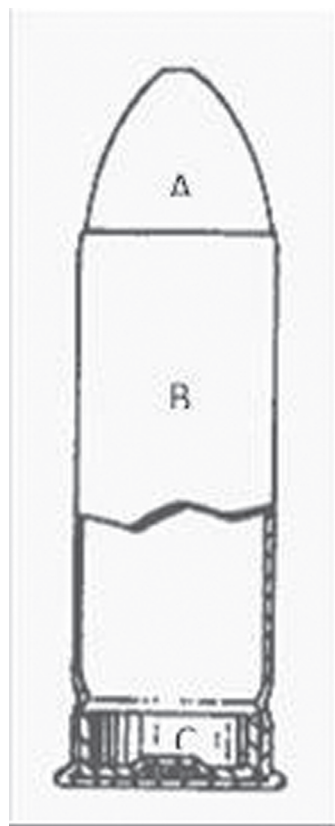


Figure 49. Parts of a cartridge are illustrated: A. bullet, B. powder, and C. primer (internal, external, or rim).



weapon's manufacturer and model (Figure 50). Examples in Figures 51–54 are at approximately 10x magnification.

Once a cartridge has been fired and the breech opened, an extractor mechanism contacts the rim of the now-empty casing and extracts it from the rifle. Over time extractor technology advanced to provide higher reliability during the reloading process. Extractor type marks are subject to a number of dynamics that result in the depth, length, and width of the mark left by different extractors in different types of firearms, as well as the design of the breech, breech block, and back pressure developed during the firing of the cartridge. Within the limits of available resources, extractor marks on the empty 14EL311 casings were divided into three basic types (Figures 55–57).

Extractors vary by manufacture type and model. Figure 58 is an example of the Remington rolling block design, extensively used by buffalo hunters in the late 1860s through the 1880s.

An internally primed (Benet system) .50–70 casing (Figure 59) was recovered from 14EL311. The .50–70 Government cartridge was a black powder

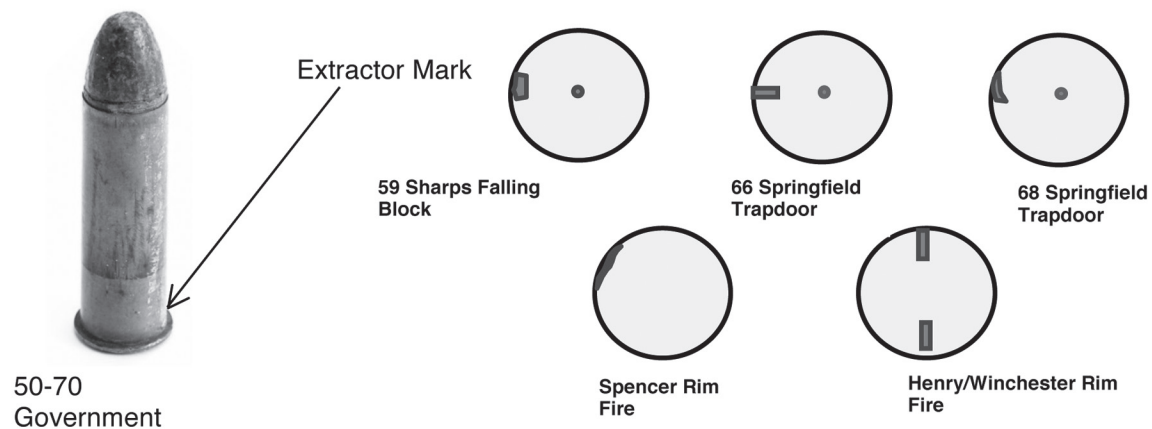


Figure 50. Distinctive extractor marks on .50-70 Government cartridge casings are made by different firearms.

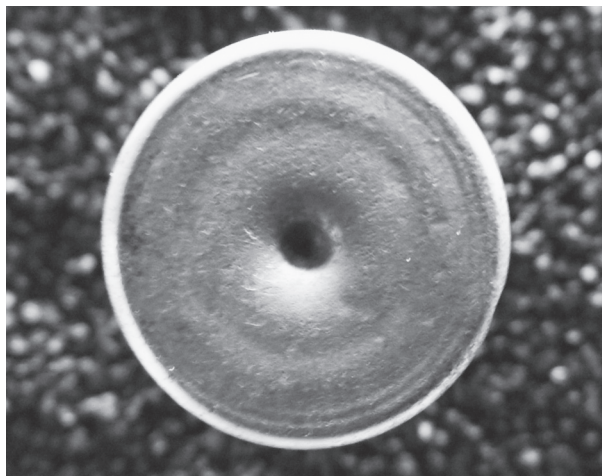


Figure 51a. Firing pin mark on a .50-70 Government cartridge casing has an oblong drag mark at the 5 o'clock position that is indicative of Sharps rifles.

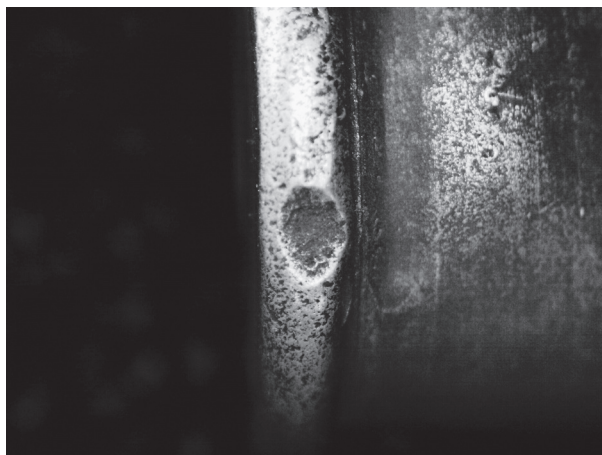


Figure 51b. Extractor mark on the same cartridge is the relatively small type "A" mark, also typical of Sharps rifles.



Figure 52a. Springfield 1866-1873 firing pin is typical of trapdoor models.

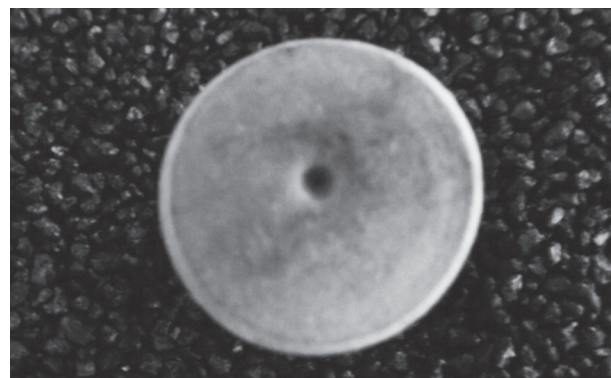


Figure 52b. Off-center firing pin mark is indicative of side hammer rifles (Scott et al. 2000).

round, adopted in 1866 for the Springfield Model 1866 Trapdoor Rifle (first Allin Conversion). The .50-70 cartridge became the official cartridge of the U.S. military until replaced by the .45-70 Government cartridge in 1873. Properly designated the .50-70-450, the cartridge was .50 caliber with 70 grains of black powder propelling a 450 grain bullet (Flayderman 2007). The .50-70 was used extensively by buffalo hunters as it was accurate over a long distance and had considerable killing power. In addition, the cartridge was relatively inexpensive and readily available.



Figure 53a. Remington rolling block rifles employed a shorter pin with a broader and heavier impact point.



Figure 54a. Sharps rifles used a broader firing pin than the Springfield and Remington rifles and produced a significantly greater hammer force.

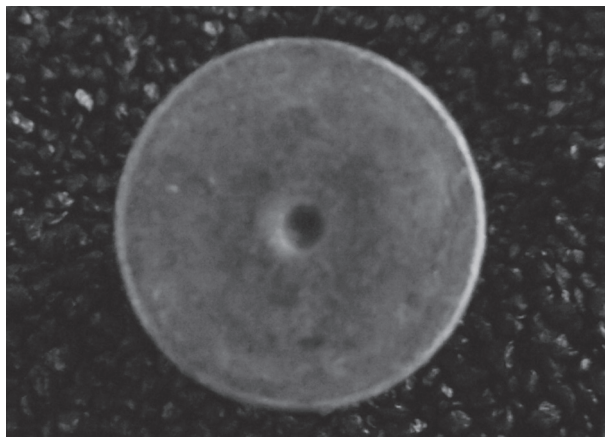


Figure 53b. Hammer directly in line with the breech and firing pin resulted in a dead-center pin mark.

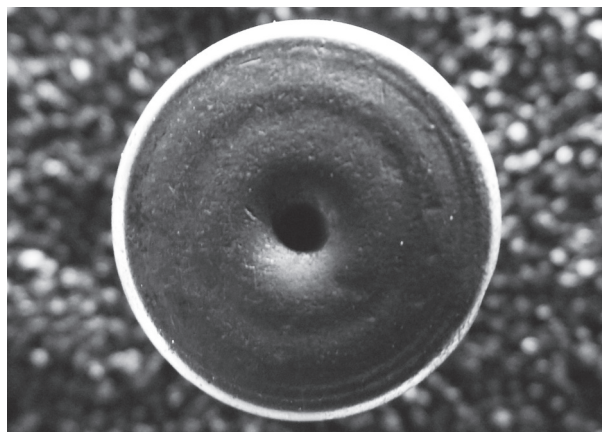


Figure 54b. Circular impact rings are visible around the firing pin and the drag marks.

Designed by Christopher Spencer in 1860, the Spencer repeating rifle was used extensively in the Civil War. Over 200,000 were manufactured and were readily available on the High Plains in the post-war period. The Spencer was the first rifle capable of holding and firing multiple (seven) cartridges, repeating from a tube in the stock that fed the breech via a lever action block. Figure 60 pictures the most common ammunition for the Spencer repeating rifle, a .56–56 caliber, usually using a 350-grain bullet fired by 42 to 45 grains of black powder.

The .44 caliber Henry (Figure 61) and later Winchester cartridge were initially developed by Benjamin T. Henry in 1860 and used in the original Henry rifle, introduced as one of the early breech-loading repeating rifles of the Civil War era. Manufactured by the New Haven Arms Company, the Henry evolved into the Winchester Model 1866 that was extensively used by pioneers, hunters, cowboys, and the military (Carpenter 2005).

Many cartridges can be identified by their headstamps and are somewhat temporally diagnostic when discovered in historical sites (Figures 62–65).



Figure 55. Type A: This mark is shallow and narrow, indicating little back pressure on the cartridge during firing or by the design of the breech block. This is probably from an 1866 Springfield using a Miller type extractor.

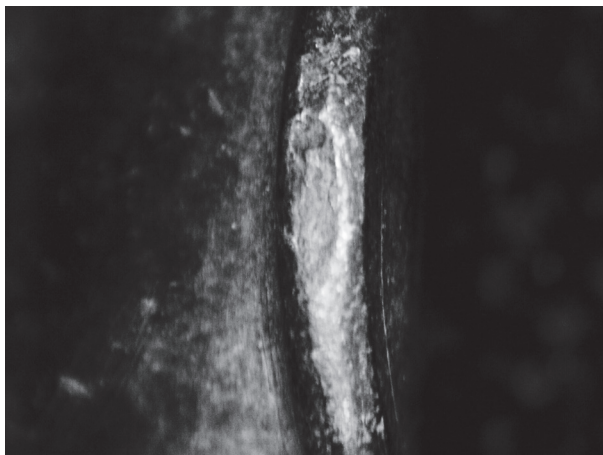


Figure 56. Type B: Probably the result of the breech design and higher back pressure during firing, this mark indicates a deeper and broader extractor mechanism used in Remington rolling block designs.



Figure 57. Type C: Indicative of another deeper and broader mechanism, this type of extractor mark is typical of falling block rifles, such as the various Sharps models.

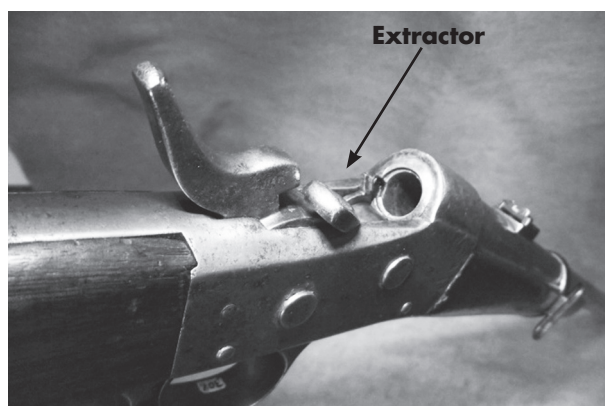


Figure 58. Extractor from a Remington rolling block rifle is pictured. Photograph by Fort Larned National Historic Site.



Figure 59. Internally primed .50-70 casing (773-1), found in F461, was identified by Cleve Mulder. Photograph by Marsha K. King.



Figure 60. Casing for .56-56 caliber bullet is pictured. Photograph by Ellis County Historical Society.



Figure 61. .44 caliber Henry cartridge is pictured. Photograph by Ellis County Historical Society.

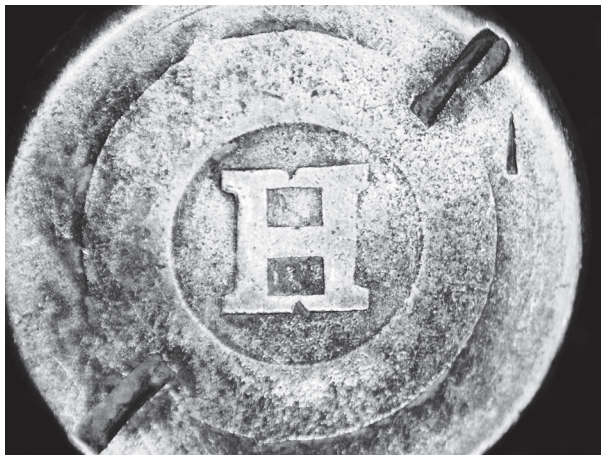


Figure 62. On this .44 cartridge H headstamp, note the dual firing pin marks, which are characteristic of the early Henry and Winchester models. A bulge in the casing head usually indicates that the cartridge was fired from a Henry rifle (Barnes 2012).

A headstamp is a type of manufacturer's mark on the base of a cartridge that indicates the maker of the cartridge and sometimes the caliber. In analyzing spent cartridge casings, it is important to distinguish between a manufacture date and a possible date of use and deposit on a site. For example, the .50–70 cartridge was manufactured from 1866 to 1882; however, stored cartridges and the rifles to fire them were used well into the early twentieth century. The .44 caliber rimfire cartridge was available and used well into the early 1920s.

None of the .50–70 Government casings recovered from 14EL311 has a headstamp. The lack of a



Figure 63. Usually found on the Spencer .56–50 cartridge, the J.G. headstamp indicates a Joseph Goldmark manufacture during the post-Civil War and Indian Wars eras.



Figure 64. S.A.W. are the initials of the Sage Ammunition Works that produced the .56–50 cartridge from 1864 to 1866.

headstamp is indicative of manufacture by the U.S. Government's Frankford Arsenal in Philadelphia, a major ammunition supplier to the United States military from 1816 to 1977.

Seriation is a relative dating method in which artifacts are placed in chronological order in an attempt to determine an occupation or activity period of a particular site. In the case of 14EL311, the artifact assemblage that offers the greatest number of temporal characteristics is the ammunition (Figure 66). Using published sources, manufacturing dates of shotgun, rifle, and handgun ammunition casings can be determined. For example, the Frankford and

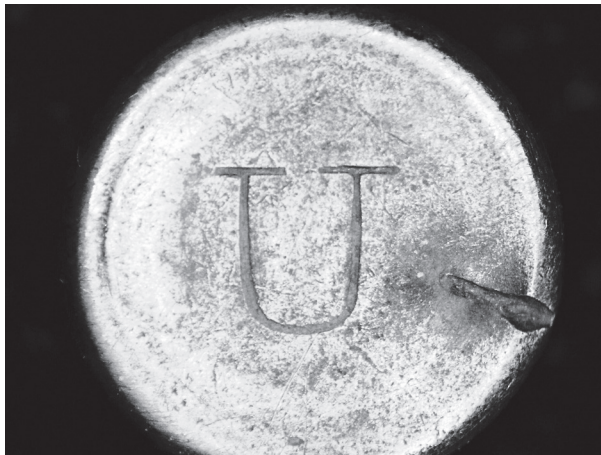


Figure 65. The U headstamp was used by the Union Metallic Cartridge Company; note the single firing pin mark. This .44 caliber cartridge most likely was fired from a Winchester Model 1866 (Barnes 2012).

Springfield arsenal records specify that .50–70 cartridges, using the bar anvil system for priming, were manufactured from 1866 to 1868, with the Benet-primed versions manufactured from 1868 to 1882. The 1868 overlap in those two date ranges generally agree with the Dixon occupation of Whisky Ranch.

Again, it is important to consider that a manufacture date does not indicate a use date. For example, bar anvil and Benet primed .50–70 casings were found at the 1876 Little Big Horn battle site and at the 1874 Red River War sites in the Texas panhandle (Cruse 2008). Developed in 1860 by Christopher Spencer, the Spencer rifle and its ammunition represent one of the earlier rim-fire technologies still in use today. These .56–56 and .56–50 cartridges are unique and easily identifiable in the field. The ammunition, generally loaded with 45 grains of black powder, is also unique in that it could only have been used in a Spencer rifle.

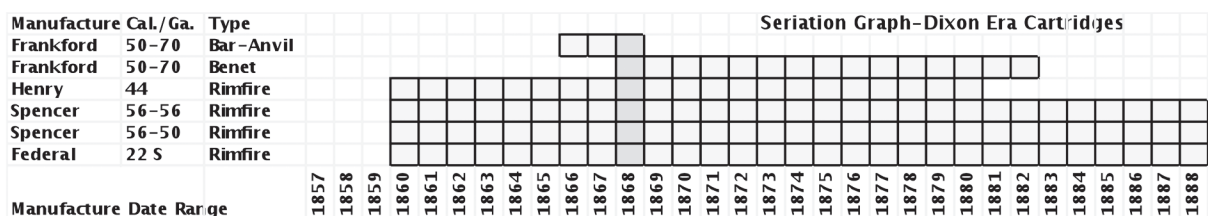
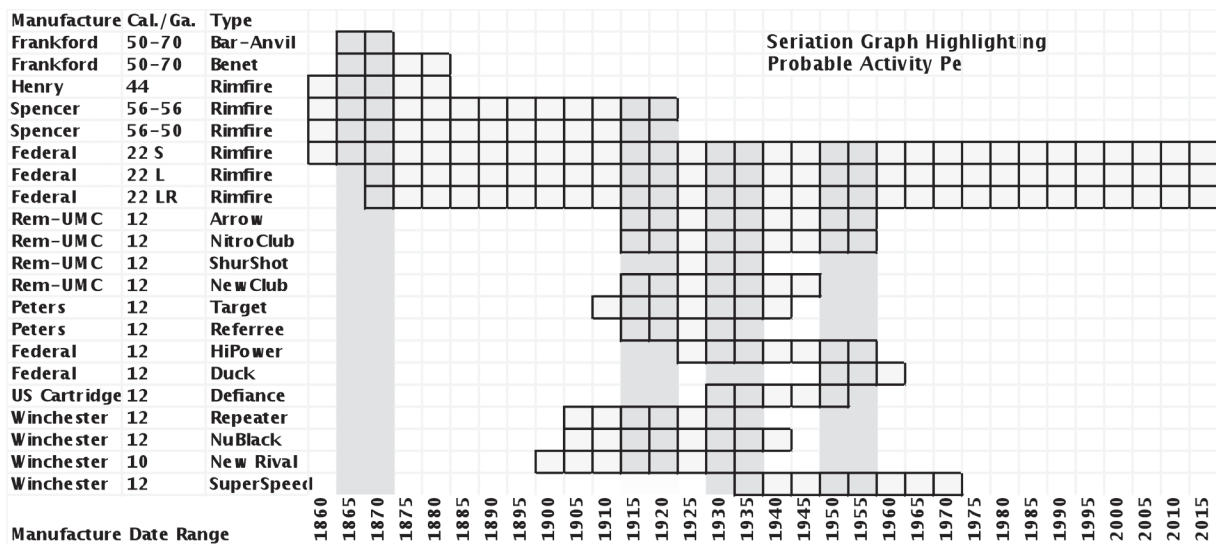


Figure 66. Relative dating of rifle cartridges and shotgun shells at 14EL311 is based on manufacturing date ranges.

CATEGORY 5: PERSONAL ITEMS

Surplus military clothing was commonly worn by buffalo hunters, pioneers, and Native Americans on the Plains in the nineteenth century. KATP excavations and private metal-detection survey at 14EL311 yielded several Waterbury military uniform buttons. Waterbury began manufacturing buttons for the military in 1812 and is still in business today, producing the same style of button pictured in Figure 67. Specific types of buttons, i.e., cavalry, infantry, etc., have the appropriate initial on the shield.

A single blade pocket knife (Figure 68) was found, sticking in the north wall of Structure 2. While representative of artifacts of the era, this style of pocket knife was very common and is of little diagnostic value.



Figure 67. Waterbury military uniform button (1266-1), recovered by metal detector survey, is pictured.



Figure 68. Single blade pocket knife (516-1), found in F411, is pictured.

An intentionally flattened Minie ball (Figure 69), probably .50 caliber, was found during the metal detector survey. Hunters and others often used flattened pieces for board games and games of chance. The Minie ball was designed by Captain Claude-Etienne Minie of France and was used extensively during the American Civil War in muzzle-loading military rifled muskets.

BUFFALO HUNTER CULTURE AND LIFEWAY

According to the Anthropology Department of Texas A&M University (<https://www.tamu.edu/faculty/choudhury/culture.html>), “culture refers to the cumulative deposit of knowledge, experience, beliefs, values, attitudes, meanings, hierarchies, religion, notions of time, roles, spatial relations, concepts of the universe, and material objects and possessions acquired by a group of people in the course of generations through individual and group striving.” Furthermore, a dictionary definition of subculture is “a group having social, economic, ethnic, or other traits distinctive enough to distinguish it from others within the same culture or society” (<http://dictionary.reference.com/browse/subculture>). While certainly part of the culture of the American West in the post-Civil War era, buffalo hunters maintained a specific set of beliefs, linguistic attributes, and material possessions that, when combined, produced a readily identifiable subculture (Meade 2008; Sandoz 1954). The following comparison of buffalo hunters and the contemporary subculture of American bikers provides an illustrative answer to the research questions: What was the general life-way of the European-American bison hunters? Did they constitute a distinct subculture of the American West?

The most recognizable attributes of a subculture are language (jargon), clothing, and iconic possessions. Imagine sitting in Drumm’s Saloon in Hays City in 1870. Two men ride up on horses, come into the bar, and order whiskey. Next, visualize sitting on the patio of Toby Jug’s bar in Hays today. Two men pull in on motorcycles, go inside, and order drinks. By observation can these men be identified as members of their respective subcultures?

Language is one of the most identifiable cultural attributes; people are recognized by their accents,



Figure 69. Intentionally flattened Minie ball (1276-1), recovered by metal detector survey, was identified by Cleve Mulder. Photograph by Marsha K. King.

word usage, and slang or jargon. Buffalo hunters certainly used jargon that had specific meaning to them and was unique to their profession. One example is the phrase “getting a stand.” In the process of hunting bison on the Plains, a hunter closed in on a herd, killing the outlying guard animals first. Then, working his way toward the center of the herd, the hunter caused the animals to form a mostly stationary group in a protective “stand.” If the stand held, meaning the bison did not stampede, the hunter could kill the entire herd. Another expression used by the hunters was “the bite.” Many hunters carried a sodium cyanide capsule inside a spent cartridge casing as a last-ditch defense. To avoid capture, torture, and an agonizing death at the hands of Comanche or Kiowa attackers, hunters could “bite” the cyanide capsule and commit suicide instead (Mayer and Roth 1958).

American bikers have similar distinctive jargon, including the term “hog.” To most people—certainly to buffalo hunters—a hog is an animal butchered for bacon and ham. To a biker a hog is a Harley-Davidson motorcycle that has been modified to his/her tastes. “Bite” takes on a different meaning in biker parlance. In the Southwest it is borrowed from the Mexican “La Mordida,” usually referring to a payoff or bribe, frequently to a law enforcement officer or politician. Another biker-exclusive term is “hard tail,” indicating a motorcycle without any rear

suspension, resulting in a rough ride. Finally, it is interesting to speculate if the buffalo hunters would relate to the biker philosophy expressed in the Harley Davidson motto, “Live to Ride, Ride to Live.”

Clothing as an identifiable subculture attribute is more apparent among bikers than it was for buffalo hunters. While some romantic ideas of buffalo hunters’ attire exist, in fact, most of the hunters were young and poor with little regard for fashion. Most bought army surplus clothing and wore whatever they could scrounge. They lived austere lives and probably resembled vagrants more than the average person of the time (see, for example, Texas buffalo hunters butchering bison at <https://www.tsl.texas.gov/sites/default/files/public/tslac/exhibits/indian/showdown/buffalohunt-1.jpg> and buffalo hunters at their camp in Texas about 1877 at <https://www.texasbeyondhistory.net/kids/forts/images/hunter-scamp-lg.jpg>). On the other hand, bikers display attire specific to their lifestyle. Leather clothing, heavy boots, helmets, and colors and patch vests are distinctive (see, for example, Sturgis motorcycle rally in August 2011 at http://www.thunderpress.net/wp-content/uploads/2012/05/Sturgis_Motorcycle_Rally_01-L.jpg).

Finally, consider iconic possessions as attributes of subcultures. In the Drumm’s Saloon scenario, the most recognizable possessions of buffalo hunters were their rifles. Commercial buffalo hunting required a heavy, large bore, big caliber weapon, usually a .50–70 Sharps, Remington, or Springfield. The average citizen of the old West generally used a much lighter rifle for hunting and personal protection.

A biker’s most prized and iconic possession is his motorcycle (Wolf 1991). Distinctive modifications make it identifiable as belonging to the biker subculture. No biker with any self-respect would consider riding a Suzuki or other foreign-made bike—just as a buffalo hunter would not have carried a .22 or .44 caliber rifle.

It is possible to point out distinct similarities between the two subcultures, even though they are separated by more than 100 years. The typical buffalo hunter tended to be young, male, independent, non-conformist, and above all self-reliant. Many of these characteristics, celebrated as hallmarks of the old West culture, are present today in the American biker. One cannot pass up the compari-

son between a classic photo of William F. “Buffalo Bill” Cody about 1880 (https://upload.wikimedia.org/wikipedia/commons/thumb/8/86/Buffalo_Bill_Cody_by_Sarony%2C_c1880.jpg/330px-Buffalo_Bill_Cody_by_Sarony%2C_c1880.jpg) and that of Dennis Hopper in the 1969 movie “Easy Rider” (https://encrypted-tbn2.gstatic.com/images?q=tbn:ANd9GcQv2nL_dLeiIdRjXvGsUEJaZYi4X7C29iS6GPrqLdOAJeWiDWno).

Another current American subculture that closely resembles that of the 1870s buffalo hunters are the independent oil and pipeline workers, spread throughout the Plains. Oilfield workers, like buffalo hunters, tend to be young, male, independent, and somewhat outside the mainstream of society. Sitting at the local bar and grill in Murdo, South Dakota, it is easy to identify oilfield workers by their appearance and jargon. Like buffalo hunters, they spend weeks and months in rural and isolated areas; they work hard, play hard, and most drink hard; and they work in rough and dangerous conditions in an attempt to make good money in a short period of time by exploiting a natural resource.

By all accounts the life of buffalo hunters was rough. They traveled light with few luxuries, coffee and sugar being exceptions; guns, powder, and lead took precedence over food and comfort items. They primarily lived off the land, often being in the field for weeks, if not months, at a time. During the 1870–1874 buffalo hide-hunting period, the U.S. economy was slow, and unemployment was high. Most of the railroads had either gone broke, were facing bankruptcy, or had halted construction, leaving thousands of young men without work. Without unemployment compensation or other social safety nets to see them through, many headed for the Plains to try to get rich quickly harvesting hides. In the words of Frank Mayer (Mayer and Roth 1958), “They tried it for a season or two, and then got wise, and quit.”

Buffalo hunters comprised a unique subculture with a recognizable and distinct lifeway. With certainty the answer to that particular research question is “yes.”

SUMMARY AND CONCLUSIONS

Excavations at 14EL311 presented an opportunity to investigate the reputed location of Billy Dixon’s

Whisky Ranch. During the presumed Dixon occupation, 1869–1872, buffalo hunting on the High Plains was in a transitional period from subsistence hunting for food and clothing to large-scale hide harvesting operations to supply hides to leather tanneries in the East to meet the demands of post-Civil War industrial expansion. In the process the last remaining herds of Plains bison were decimated to the brink of extinction by 1883.

The research design for the 2013 project centered around five fundamental questions concerning the site within the confines of the historic and archaeological domains:

Does site 14EL311 represent the Billy Dixon trading post of 1869–1871?

Based on material culture, what was life like?

What was the general lifeway of European-

American buffalo hunters? Did they constitute a distinct subculture of the American West?

How do the dugouts of the site compare to others in the Central and Southern Plains?

How did advances in technology influence the lifeway and market?

Over a 16-day period in June 2013, KAA members, supported by KSHS professional staff, excavated approximately one-half of F461 (originally inferred to be the picket house), about two-thirds of F411 (a dugout), and part of F466 (dubbed the “spring house”), and they conducted surface survey using metal detectors. More than 900 artifacts, ranging from metal banding scrap and handgun and rifle ammunition casings to common clothing and commissary items, were collected.

Analysis of the primary site features and artifacts, as well as an extensive study of available historic narratives and literature, provided some general answers to the research questions. However, arriving at definite conclusions is challenging, as the structural features and artifacts, while being of the period, are of a general nature and common throughout the Plains over a substantial time span. There was no “smoking gun” to indicate that Dixon was ever at 14EL311 or that it was used as a road ranch for buffalo hunters; physical evidence could just as well have resulted from any early pioneer occupation. Construction materials and techniques of the major structures and artifacts indicated the pos-

sibility of a series of occupations over a long period for a variety of purposes. A number of scenarios are possible, and compelling arguments on both sides of the Dixon occupation question can be made.

14EL311 SCENARIOS

Using Dixon's narrative in *The Life of Billy Dixon*, taken down and later edited by his wife Olive, at least a foundation can be established from which some general conclusions can be derived. Dixon (1926:63) described the site as being "about 10 miles south of Hays City." Using maps and GPS data, measuring along a straight line from the Chestnut Historic District in Hays to 14EL311, the distance proves to be 10.4 miles (16.8 km), which is in agreement with the Dixon narrative.

Dixon described the site as being located at "a boiling spring that flowed from an opening in solid rock." The 2013 field investigations failed to locate or identify a definite spring of any type at or near the primary features. F466 may have been a spring at one time. The drainages and water table in the immediate area have been severely modified over time, including quarrying operations in the 1940s through 1970s and recent construction of a check dam and reservoir immediately upstream from the site. Construction of Cedar Bluff Reservoir on the Smoky Hill River, extensive irrigation, and an extended drought have altered both drainage patterns and the general water table.

A previous landowner, who as a teenager in the 1940s helped quarry sand and gravel at the site, reported that a number of springs once flowed from the banks and terraces along the creek; those springs dried up once Cedar Bluff Reservoir was completed (Jim Dinges, personal communication June 2013). Additionally, the current landowner noted that some of the springs begin to flow when water is released from Cedar Bluff Reservoir. It is possible that in 1869 a spring was flowing at the site, perhaps at F466. Dixon's description of solid rock is somewhat problematic in that partial excavation and deep auger testing of the feature did not indicate any rock, solid or otherwise. However, there are a number of limestone outcroppings along the cut bank of the creek, both to the north and south. The rock used for wall supports in F461 and F411 may have come from the cut bank directly south, or perhaps the

rock described by Dixon eroded away during flooding events. It is also possible that there never was a "boiling spring that flowed from an opening in solid rock" at 14EL311.

In some ways Structure 1 matches Dixon's description of the picket house (Dixon 1927:88). Upright picket construction techniques were common during the period and were used extensively in western Kansas, eastern Colorado, the panhandles of Oklahoma and Texas, and the greater Southwest. The technique reflects early Spanish influence in the area. During field investigations no remnants of any upright wall pickets were discovered. While larger upright support beams and limestone wall supports were evident in the structure, there were no remnants or post molds where one would expect pickets to have been located. Perhaps the pickets were not driven into the ground, and the limestone rocks were used as the primary wall supports. Pickets may have been tied back into the surrounding soils. Wood, particularly for use as fence posts and in building construction, was a valuable commodity in 1870. When the site was abandoned, the pickets might have been collected and transported to a different location, or the pickets might have been used for firewood during subsequent site occupations and activities. At some time, presumably after occupation, Structure 1 burned; whether intentional or accidental is unclear.

In his narrative Dixon (1927:63) described the construction of a "big" dugout associated with the picket house. While Structure 2 is certainly representative of an 1860–1870 Plains dugout, it is not particularly large. Of course, the term "big" is relative in that dugout construction varied greatly, depending on intended use and available materials. Pioneers with families were inclined to build rather sizable dugouts, while High Plains hunters tended to construct much smaller units, just large enough for weather protection and/or for temporary storage of supplies.

F411 contained a partial limestone wall about midway through the north-south plane, which indicates later modification. The entrance of the site overlooks the creek and a large alluvial and marshy area to the east. Analysis of shotgun shells around the feature and conversations with previous landowners indicate that the feature may have been used by hunters. Seriation analysis of the shells indicate

three possible activity periods: 1915–1920, 1930–1935, and 1950–1960 (see Figure 66). The seriation graph used the manufacture dates of different types of shotgun shells as temporal indicators; the actual dates of use cannot be determined with any certainty. If properly stored, rifle and shotgun ammunition can be used decades after manufacture; there is indefinite “shelf life” (Figures 70–71).

Furthermore, an extensive review of the available literature leaves the major question of site identity unanswered, although Dixon’s narrative and secondary, sometimes tertiary, sources suggest that the site might be Whisky Ranch. Notably, the majority of the buffalo-hunter narrations were compiled years after the events.

The best temporal marker in written accounts is the blizzard of November 17, 1871. Dixon described being caught in the storm while hunting along the headwaters of Pawnee Fork (River), probably near his permanent camp on Hackberry Creek, approximately 56 miles (90 km) southwest of 14EL311.

A few days after the storm had abated, I decided to make a trip to Hays City and bring back supplies for the outfit . . . Our camp was on Hackberry, and I went prepared to stay all night with Reynolds at the road ranch, the first night out (Dixon 1927:68–69).

This part of the story is problematic, considering the distance. Could Dixon have traveled by wagon a distance of 56 miles in a single day? Considering the weather and terrain, it is highly unlikely that he could have made it to his road ranch in that short period. On his trip to Hays City, he found the road ranch abandoned but did see a fellow hunter’s outfit sheltered at Five Mile Hollow, which is about 5 miles (8 km) up the trail from 14EL311. Dixon did not stop but continued to Hays City, still unaware of the disaster that had occurred during the blizzard; some men froze to death, and others lost limbs to frostbite. During this episode Dixon learned that Reynolds had cleaned him out and disappeared, never to be seen again.

The blizzard was noted by Charlie Rath (1861), who remarked that his partner Andy Johnson described the storm and that 8 or 10 men lost their lives 10 miles south of Hays City. The 10-mile distance implied the Dixon road ranch and not Five Mile Hollow. Additionally, George W. Brown men-

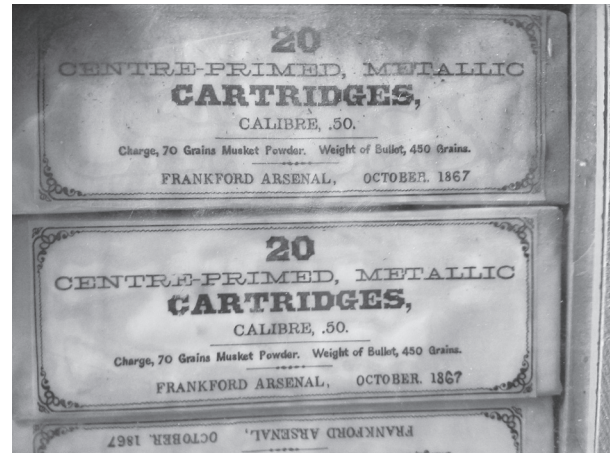


Figure 70. Frankford Arsenal .50–70 cartridges in shipping cartons are displayed at Fort Larned National Historic Site.

tioned the November 1871 blizzard in his memoirs (Gilbert 1986), providing multiple-source confirmation of the date.

Cross referencing of sources indicates that Dixon was working in the Dodge City area at least by the fall of 1872, probably from his camp on Hackberry Creek. In his memoirs Bat Masterson stated, “I first became acquainted with Billy Dixon on the buffalo range in the fall of 1872” (DeArment 1979).

Presuming that 14EL311 is, in fact, the location of Dixon’s Whisky Ranch, the most likely scenario would have Dixon and company constructing the picket house and dugout in late 1868 or early 1869 and abandoning the site in early spring of 1872. The seriation analysis of the cartridge casings recovered during excavations at 14EL311 established activity dates there between 1868 and 1872.

Seriation analysis of the recovered shotgun shells indicated that the site also was used for hunting from about 1915 to around 1960. Hunting activities might explain the apparent or at least inferred modification of the Feature 411 dugout. Modification of the dugout for duck or other waterfowl hunting may explain the elevated center wall in the structure, which indicates a later or secondary modification.

The empty rifle cartridge casings remain the most diagnostic of all the artifacts recovered. Even though some temporal information can be gleaned from the casings, their use as an occupation indicator is problematic. Taken in context with other recovered artifacts, military buttons, horse tack,



Figures 71a&b. Shipping boxes from Frankford Arsenal are displayed at Fort Larned National Historic Site.

barrel and keg bands, cans and bottle glass, one could argue that the site was used by the Army for camping before or after the presumed Dixon occupation. The purposeful crushing or crimping of the spent casings is indicative of Army use. Arguably, Army units were instructed through official orders to crush or otherwise make spent cartridges unusable so that they could not be reloaded. However, it should be noted that whether internally primed .50–70 cartridges could or could not be reloaded has been and remains a subject of great debate.

There is at least one last but improbable scenario remaining. In his narrative Dixon described his road ranch location as being on a “main traveled road leading to Hays City.” Site 14EL311 is located along the well-established Fort Hays to Fort Dodge Trail, part of the military trail system established after the Civil War to protect people travelling the Smoky Hill and Santa Fe trails. The trail was well known as the “Military Trail” or the “Military Road.” Surely Dixon would have referred to it that way. A much less studied but equally important trail in the area was one that left Fort Hays and terminated at Fort Larned. Both the Military Trail and the Fort Larned Trail begin at Fort Hays, then diverged at angles to Fort Dodge to the southwest and Fort Larned to the southeast. As they converge on Fort Hays, both are within sight of Five Mile Hollow, where Dixon observed the Snuffer party after the November 1871 blizzard. Depending on how one chooses to interpret the story, one could make the argument that Dixon’s road ranch was on the Fort Hays to Fort Larned Trail, probably about 10 km east of 14EL311. Preliminary observations of that area on the ground and via satellite imaging indicate the presence of dugouts, trails, and other structures. It is possible that 14EL311 was an Army camping area and that the Dixon site was on the other trail.

RECOMMENDATIONS FOR FUTURE RESEARCH

The era of the High Plains buffalo hunters, even though short in duration, is an important part of American West history and legacy. The era represents the transition from the earliest explorers, the fur trade, and the old “Wild West” to the beginnings of the pioneer epic of early settlement, immigration, and agriculture. Archeologically the era has been sorely neglected; the investigation of 14EL311 represents only a beginning. 14EL311 may be the only example of a formally excavated buffalo hunter camp in Kansas; a review of the available literature indicates that there are many more. Much remains to be done.

1. Billy Dixon’s main camp on Hackberry Creek has never been found. An investigation of that site would yield a comparative artifact collection

that would be significant in itself, but also would provide insights into the era and 14EL311.

2. There are additional buffalo hunter activities and a road ranch mentioned in the Pfeifer area just south of the Smoky Hill River. This activity area would have been contemporary with Dixon's.
3. Preliminary investigations of several sites in Gove County indicate the presence of a large, probably commercial, buffalo-hunting and hide-processing location.
4. Excavations of the Rome site in Hays have produced data indicative of the transition period from the Old West days of Bill Cody to the settlement of the area by Volga Germans. In addition, the Rome site is thought to be the location of the hunting and hide-processing location of the Clarkson brothers shortly after the infant city was abandoned by Cody in late 1867.
5. The area along the Fort Hays to Fort Larned Trail either side of the Smoky Hill River warrants investigation as preliminary observations indicate the possibility of buffalo hunter sites.

Background research conducted during the Billy Dixon/buffalo hunter project illuminated a number of potential academic research subjects.

1. The actual population of bison on the Plains in 1870 and just how many were harvested during the buffalo hunter era has always been in contention. Would modern research techniques yield new information and insight?
2. How did the intrusion of the railroads, domestic livestock, wild horses, exotic floral species, and other factors impact the High Plains environment and what impact did that have on the herds?
3. How did the financial collapse of 1873, the first Great Depression, impact bison hunting and the general transitions of the High Plains?
4. Political turmoil in Europe, particularly in Germany and Russia, led to the first wave of central European migration to the High Plains. How did that migration impact the environment and the subsequent destruction of the bison herds?

Investigations of 14EL311 were purposely limited to two primary research domains: historical and archeological. Applying additional research domains may generate additional information about

and insights into the buffalo hunter era and culture. For example, employing environmental and/or economic domains produce a substantially more dynamic vision of the era and may produce a more realistic and meaningful representation of the transitional period from the end of the Civil War to the establishment of immigrant communities in the late 1870s and 1880s.

What would Billy Dixon say? "History is not about them, it is about us!"

ACKNOWLEDGMENTS

When first approached about serving as the Principal Investigator for the 2013 KATP field school at 14EL311 and providing a report of findings, I estimated the task would take less than a couple of months. Several years later it is evident that buffalo hunters and their culture comprise a portion of the history of the American West that will require years to adequately research and describe. Without the help of many knowledgeable individuals and the support of a number of institutions, I would never have been able to produce a meaningful report. It is impossible to include everyone who graciously provided input, expertise, and assistance during the study. The following list is by no means all inclusive, and apologies are extended in advance for any unintended omissions.

Institutions, organizations, and companies:

Buffalo Arms Company: Ponderay, Idaho

Cabelas: Wichita, Kansas

Ellis County Historical Society and Museum: Hays, Kansas

Fort Hays State University,

History and Geophysical Departments: Hays, Kansas

Fort Larned National Historic Site: Larned, Kansas

Gander Mountain: Wichita, Kansas

Hutchinson County Historical Museum: Borger, Texas

Kansas Anthropological Association: Topeka, Kansas

Kansas Historical Society: Topeka, Kansas

National Archives: Washington, D.C.

National Rifle Association Museum: Washington, D.C.

Rock Island Auction Company: Rock Island, Illinois

Springfield Armory Museum: Springfield, Massachusetts

Texas Beyond History: www.texasbeyondhistory.net

Wichita State University, Ablah Library: Wichita, Kansas:

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BOOK REVIEWS

Pyramids of Túcume: The Quest for Peru's Forgotten City. THOR HEYERDAHL, DANIEL H. SANDWEISS, and ALFREDO NARVAEZ. Thames and Hudson, New York, 1995. 240 pp., 177 illustrations, including 43 in color. ISBN: 0500050767. Reviewed by Denise Wallace, Kansas Anthropological Association.

The principal author of *Pyramids of Túcume* is the same Thor Heyerdahl known for his sailing expedition decades ago from Peru to Polynesia on the balsa raft *Kon-Tiki*, named after Con-Ticci-Viracocha, the Incan seafaring man-god, representative of the sun on earth. However, this text does not focus on Heyerdahl's many sailing expeditions, but rather on his 1980s and 1990s archeological work at Túcume, Perú. This vast city, 12 km inland from the Lambayeque coast, includes 26 pyramids. Heyerdahl's work, along with that of coauthors Daniel Sandweiss and Alfredo Narvaez, revealed a 540-acre complex that spanned from the Lambayeque culture in A.D. 1100 through the Chimú and Incan occupations, to within a few years of the 1532 Spanish conquest by Francisco Pizarro.

The text reads like a combination history textbook and series of archeological papers on various aspects of Túcume, the largest pyramid complex in South America. Each of the ten chapters was written by one of the three coauthors and delineates his findings as they pertain to the section of which he was in charge. Nevertheless, "the results are the product of a coherent plan of research and of constant interaction among all involved" (p. 6).

The archeological timeline of Túcume begins with the Preceramic period and then moves to the Lambayeque period (A.D. 1100–1350). Prior to that there was no "important organized society in the valley" (p. 36). The maritime theme is pervasive throughout Túcume, an example of which can be seen within the complex at *Huaca Las Balsas* in the frieze depicting the anthropomorphic wave as the border (p. 133 photograph). Additionally *Spondylus* shells, the sacred mollusk brought from Ecuador (p. 61), were used for jewelry inlays and beads (p. 99) at an onsite workshop (p. 168). Some low status (few grave goods) burials at the project

site date to this period (p. 155). "Food was served and eaten from shallow bowls or plates of various forms. Most common were mold-made bowls of undecorated brownware with ring bases made from a circular fillet of clay. In contrast, more finely made, often highly polished blackware bowls are a regular if less common constituent of the deposits" (p. 161). Lambayeque descendants still populate the villages of the Lambayeque Valley today.

Next in the timeline is the Chimú period (ca. A.D. 1350–1470) with a capital in Chan Chan. As the Lambayeque area was experiencing polity changes, part of the focus of power might have shifted to Túcume, making it "*primus inter pares*, exerting influence over the region as the principal religious center" (p. 65). Some of the burials date to this occupation (p. 155) and are marked by a funerary platform open tomb, with the body wrapped in a shroud, lying extended east/west, which is considered a Chimú burial pattern (p. 157–158). The site contains Chimú pottery, described as redware with a reticulated paddle-stamped design (p. 158).

Perhaps the most familiar to the non-Peruvian is the Inca period (ca. A.D. 1470–1532). The team at Túcume found more than 100 seated-and-flexed burials, the standard Incan position for burying the dead, which date to this occupation (p. 159, 173). It was standard for the Incan lords to wear earspools from which their nickname "longears" (*orejón*) is derived (p. 96). The pottery from this time includes anthropomorphic redware and zoomorphic blackware typical of the Incan culture (172–173:Figure 154).

From the Colonial period (post 1532) a few Colonial instruments have been found (p. 155), but it appears that the site was destroyed and abandoned just after the Conquest. Oral history in Túcume holds that while most Tucumanos readily converted to Christianity, there were some who did not. The Spanish dressed up as devils and arrived at high speed on a four horse-drawn wagon to convince the nonbelievers. "At night the Spaniards carried wood for great fires on the top of the highest *huacas* (pyramids)" (p. 121), calling the entire sacred area El Purgatorio (Purgatory). "The flames from the pyramids flickering in the night sky were visible for



miles around, and the Spanish clergy told the people that to approach the area was deadly dangerous, for this was the entrance to Hell” (p. 121).

What would an archeological site be without the effects of weather? At Túcume those effects are on a large scale throughout the site from the repeated El Niño weather events through time. “The coast of Peru is an arid desert broken only by the rivers which descend from the Andes Mountains to the east. It is along the river valleys that irrigation can be practiced and large populations supported” (p. 56). The Lambayeque Valley Complex, of which Túcume is a small part, is a system of agricultural canals. In fact, Túcume would not have existed as a large cultural center without the Taymi Canal, probably built between A.D. 1000 and 1100 (p. 72). Continuing into modern times is the yearly group effort to repair the levees and areas damaged by the annual floods. New Orleans and other areas subject to such damage could benefit from this approach!

Naturally, the subject matter brings to mind Egypt and speculation about how the Túcume pyramids compare. While they, too, were part of a religious center, complete with royal burials and grave goods, more of the daily life and activities of the



common people are evident. While it is grand to marvel at the life of kings, I am glad to be in the Midwest, working on archeology where I am able to see the daily life of people to whom I can relate. On the other hand, throughout the text, the au-

thors refer to *a variety* of radiocarbon dates from analysis performed on artifacts throughout the site. Oh, to work at such a site and have the funds to do so!

Blood Run: The "Silent City." DALE R. HENNING and GERALD F. SCHNEPF (with selected illustrations by Lance Foster). Pioneer Communications, Inc./The Iowan Books, Des Moines, Iowa, 2014. 88 pp., 52 illustrations (many in color), acknowledgments, recommended readings. \$11.95 (softcover, 5.75 x 8.5 inches). ISBN: 978-1-934816-46-2. *Reviewed by* Jim D. Feagins, St. Joseph Museum.

Blood Run is one of those special, outstanding sites that archeologists encounter infrequently. It occupies an approximately 3.5-mile stretch of the Iowa/South Dakota border, surrounding a portion of the Big Sioux River and Blood Run Creek. Blood Run Creek was so named because of the stream's red color during times of heavy rain, when the pigment comes from eroding iron oxide.

By at least the early 1860s, early settlers recognized this site as a place once heavily occupied by prehistoric inhabitants. In the many decades that followed, the site often was mentioned in the literature of the day, and considerably more attention was given once serious archeological research began there. In 1970 the site was memorialized as the Blood Run/Rock Island National Historic Landmark. Today, a portion of the site is being developed as a state park—thus helping to preserve archeological resources and the pastoral beauty of the area, while educating future visitors about the site's history and cultural significance, as well as its spiritual importance to Native Americans.

Various prehistoric peoples used the area for many millennia; however, Blood Run was occupied chiefly from 1500 to the early 1700s by literally thousands of Native Americans: the ancestral Omaha, Ponca, Ioway, and Oto. During these two centuries the authors estimate that "population numbers probably fluctuated to over 6,000 residents . . ." (p. 22). But for more than three centuries this population has been silent; Henning and Schnepf call it a "Silent City." While appropriately labeled,

the site has been able to speak by proxy through remnant stories passed on by tribal descendants and the diligent efforts of archeologists reading the storied remains of features and artifacts and their associations, as recorded in the soil.

With the arrival of settlers, followed shortly by the railroad, many farms were established across the site. The earthworks—a large breastwork forming an irregularly shaped redoubt of approximately 5 acres, a large serpent effigy mound, and abundant large mound clusters—were readily observed in areas of Blood Run, along with the numerous artifacts plowed up in the fields. The now-destroyed serpent effigy was said to have been 1/8 mile long, 4 or 5 feet wide, and perhaps 3 feet high. Originally among the mounds were stone outlines, showing the locations of circular and elongated houses. These stones were removed to facilitate agricultural pursuits, and subsequent cultivation reduced the mounds to the point that most were no longer discernable. In addition, various gravel quarrying operations obliterated much evidence of the ancient inhabitants. Unfortunately, the site attracted the attention of unscrupulous "pothunters" with their indiscriminate digging. In spite of destructive human and natural actions over time, remnants of as many as 80 mounds can still be identified on the site.

A number of large glacial erratics (mostly Sioux quartzite boulders) are scattered over the site. Most unusually, some of the larger stones were modified extensively by pecking and grinding hundreds of small pits over their exposed surfaces. While possibly ceremonial, their purpose is not really known.

The evidence left behind by the ancestral Omaha, Ponca, Ioway, and Oto is known archeologically as part of the Oneota cultural tradition. Social and religious beliefs, as well as everyday lifeways, make for a tradition of distinctive tool construction (artifacts, particularly pottery) and features (pits, hearths, house shapes, and other evidences in the soil) that can be identified by archeologists. Located in large portions of the Midwest and in the easternmost por-

tions of the Northern and Central Plains, the Oneota tradition lasted from early in the thirteenth century until the Protohistoric period. Blood Run, one of the outstanding trading and ceremonial centers of the Oneota tradition, was established late in that time frame.

Among the most common artifacts found on the site are the thousands of triangular arrow points and end scrapers. Clearly many animals, but mainly bison, were hunted, and their hides were prepared at Blood Run. This publication presents some outstanding photographs of a variety of artifacts: grooved mauls, end scrapers, an antler end scraper handle, full-grooved axes, stone drill bits, Catlinite pipes, worked pipe stone pieces, a typical Oneota pottery jar, historic trade-metal tinklers, copper earrings, a Man-in-the-Moon glass bead, marine shell ornaments (including an effigy and a Dutch-manufactured runtee), bison scapula digging tools, Catlinite tablets with engraved motifs (a star, water monsters, thunderbirds, bison). Most amazing is a

hide bag fragment, preserved from excavated context.

Blood Run: The "Silent City" is a slick-paper volume written for the general public. However, it contains plenty to recommend it to historians, archeologists, and all who are interested in Native Americans and the past. The well-written text is an easy read, while still authoritative. First author Dale Henning has researched the site intermittently for more than 50 years and is widely recognized as the leading authority on Blood Run. Gerald Schnepf is experienced at writing for the general public. The abundant photography is excellent. This fine volume serves to introduce and summarize the site. Readers wanting more in-depth information can turn to the recommended reading section. *Blood Run: The "Silent City"* may be obtained by contacting Pioneer Communications by phone at 877-899-9977 x211 or by e-mail at kbrocka@pioneercommunications.com.

The Darkest Period: The Kanza Indians and their Last Homeland 1846–1873. RONALD D. PARKS. University of Oklahoma Press, Norman, 2014. 317 pp., including extensive endnotes, bibliography, and index. ISBN: 978-0-8061-4430-6. *Reviewed by* Tricia J. Waggoner, Kansas Historical Society.

Ron Parks opens his book on the Kanza with an account by Wilson Hobbs of a Kanza woman carefully getting her children across the Neosho River. The account is an intimate one that serves as a reminder that the Kanza are not an abstract concept, but a group of people navigating their everyday lives through a difficult course.

The Darkest Period focuses on the Kanza on their reservation near Council Grove between the years of 1846, when the Kanza were removed from their villages along the Kansas River, and 1873, when the Kanza were removed from Kansas to Oklahoma. Other historical events that took place during this time were the Mexican American War (1846–1848), multiple economic recessions, California (1849) and Colorado (1858) gold rushes, Kansas Statehood (1861), Civil War (1861–1865), and postwar expansion and industrialization. All of these happenings

affected the Kanza in their prairie home, and Parks spends time on each.

Throughout the book Parks mixes impersonal government statistics, Indian policy, and official reports with intimate firsthand accounts, recorded speeches, and personal letters to paint a more complete picture of Kanza lives. These narratives include kindnesses and cruelties by the Kanza and their white neighbors and thereby dispel the myths that surround the Plains Indians as either purely savage or noble. Like all people, they were both—at different times under different circumstances.

Parks does not shy away from dealing with this very dark part of American history. The concept of Manifest Destiny, rooted in the idea of white European cultural superiority, combined with ever-changing government policy and neglect, had devastating consequences for the Kanza. Especially catastrophic was the decision to place the Kanza on the Santa Fe Trail, already a major thoroughfare and an area destined to attract white settlers, who would push for Indian removal. In the 1840s the Kanza numbered 1,600, but by the time the tribe was relocated to Oklahoma fewer than 600 remained.

In general the book is organized chronologically,

beginning with the signing of the 1846 treaty that ceded the lands along the Kansas River and ending with the removal of the Kanza from Kansas. The chronology jumps around a bit within each chapter, which brackets a period of time. At the end of each chapter are a few paragraphs summarizing the contents and reminding readers of the most important points covered. These paragraphs also serve as good refreshers when referring back to the book. Mul-

tiple clear maps show the movement of the Kanza and images from the time period covered.

The Darkest Period tells an important story about cultural change and displacement. It is enjoyable to read for pleasure, but it is a treasure trove for the researcher as well. The book is a must for anyone interested in the Kanza, the contact period, historic American Indians of the Great Plains, or relocation.

ABOUT THE AUTHORS

Debi L. Aaron



Debi is a member of the Kansas Anthropology Association and currently serves as president of the state organization. Since attending her first Kansas Archeology Training Program field school at Scott Lake State Park in 2009, she has been working on earning her KAA Certification. In 2011 she worked with Dr. Jack L. Hofman, associate professor of anthropology at the University of Kansas, on recording Clovis points in Wilson, Montgomery, and Republic counties and in 2011–2013 on stone arched-ceiling caves in Republic County. Archeologically speaking, she loves everything from Paleo to Historical. Debi Aaron nee Holtzen was born and raised in Deshler, Nebraska. She has three children: Steven, Kelsey, and Colin. She is employed by Thayer County as a 911 dispatcher for emergency services. In addition to archeology, she volunteers at the Thayer County Museum in Belvidere, Nebraska. She enjoys spending time with her children, camping, canoeing, and exploring anything and everything.

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Donald Blakeslee is Professor of Anthropology at Wichita State University. He has been conducting archeological research in Kansas since 1976.

Delaney Cooley



Delaney Cooley is a graduate student in the Department of Anthropology at the University of Oklahoma. Prior to attending OU, she received her B.S. in anthropology from the University of Iowa in 2010. Her current research focuses on Native American responses to European colonialism in the Great Plains and changes in Ute affiliated lithic technology in the Uncompahgre Plateau of Colorado.

Jim D. Feagins



Jim Feagins is a private archeological consultant who also serves as part of the adjunct archeological staff for the St. Joseph Museum. He received a BS degree from Pittsburg State University and a MNS degree from the University of Oklahoma. After 30 years as a science instructor for Consolidated School District No. 4, Grandview, Missouri, he retired in 1995. Active in promoting archeological education, he is president emeritus of the Missouri Archaeological Society. He also served as president of the Kansas City Archaeological Society and as a vice-president of the Missouri Association of Professional Archaeologists and the Kansas Anthropological Association. He is a life member of the KAA.

Matthew E. Hill, Jr

Matthew E. Hill, Jr. is an associate professor in the Department of Anthropology at the University of Iowa. He received his M.A. from the University of Kansas and Ph.D. from the University of Arizona. His research interests include human-environmental interactions across various environmental settings (Great Plains grasslands, Rocky Mountains, desert Southwest). His current research focuses on adaptations of Puebloan migrants to western Kansas around A.D. 1650 and long-term changes in subsistence practices among Great Plains and Rocky Mountains big game hunters.

Robert J. Hoard

Robert Hoard grew up in Omaha, Nebraska, and received degrees in anthropology from the University of Nebraska-Lincoln (Bachelors), the University of Oregon (Masters), and the University of Missouri-Columbia (Doctoral). He has worked in many parts of the United States and for a brief period in Micronesia. He is interested in the performance characteristics of prehistoric pottery, the adoption of horticulture by people in prehistory, and the application of techniques from physics and chemistry to archeological investigations. He currently is the State Archeologist of Kansas.

Jack L. Hofman

Jack Hofman teaches archeology in the Department of Anthropology at the University of Kansas. His interests are primarily focused on lithic technology, zooarchaeology, early prehistoric hunters, large scale land use, and studies of technological and cultural change. He has been involved in archeological research in the Great Plains region from Texas to Wyoming since 1971. During the past few years he has been involved in the Republic County Area Archaeology and Paleoecology Project, including research on Paleoindian, early historic, and Pawnee archeology. The article included in this issue is derived from ongoing research with sites and collections in the Cuesta Plains region of southeastern Kansas.

Steven R. Roberts

Steve Roberts holds B.G.S. and M.A. degrees from Wichita State University and has additional training on ESRI ArcGIS. His 2003 thesis was entitled, *Archaeocartographic Survey-Cimarron National Grasslands*. He is principal investigator of his own cultural resources management firm in Wichita. Previously he worked on term assignments with the USDA Forest Service, United States Army, and SWCA Environmental Consultants.

Robert J. Speakman

Robert Speakman is an archeologist and geochemist. He received degrees from Northern Arizona University (Bachelors), the University of Missouri (Masters), and the University of Barcelona (Doctoral). His research interests include radiocarbon dating, isotope geochemistry, and elemental analysis of cultural materials (pottery, stone, and metal). He is currently Director of the Center for Applied Isotope Studies at the University of Georgia.

Byron M. Strom

Byron Strom has participated in KATP field schools and other KAA activities since 2006. He has an M.S. in analytical chemistry from Iowa State University and taught chemistry at the Des Moines Area Community College in Ankeny, Iowa, for 30 years. Byron spent 14 months in Viet Nam in 1970 and 1971 in the 25th Infantry Division, United States Army.

E. Malcolm Strom

Malcolm Strom is retired from the Soil Conservation Service, now the Natural Resources Conservation Service. He graduated from Kansas State College in 1939 with a degree in agronomy. Malcolm spent time in South Dakota as work unit conservationist and area conservationist and in New Hampshire as assistant state conservationist. He spent two years in Nigeria, administering an agricultural school on behalf of USAID. He is a veteran of World War II, having been inducted at Fort Leavenworth on December 7, 1941, and served for four years, some of that time in France, Belgium, and Germany with the 102nd Evacuation Hospital. He is also a Korean War veteran. Malcolm has had a lifelong interest in Native Americans and participated in the KATP field school in Council Grove in 2006.

Sarah Trabert

Sarah Trabert is from Dodge City, Kansas, and received degrees in anthropology from Kansas State University (Bachelors) and the University of Iowa (Masters and Doctoral). She is an assistant professor of anthropology at the University of Oklahoma. Her research centers on the ways that Native peoples living on the Great Plains responded to European colonialism after A.D. 1600, and she has active field projects in Kansas, Nebraska, and Oklahoma.

Tricia J. Waggoner

Tricia Waggoner grew up as part of a military family, moving many times and finally landing in Kansas in 1993. She received degrees in art and anthropology from Cowley College (Associates) and Wichita State University (Bachelors and Masters). She has worked for the Kansas Historical Society as the highway archeologist since 2006. Her main interests are contact period archeology and prehistoric textiles.

Denise Wallace



Denise is a language and culture instructor at Wentworth Military Academy. She has an extensive background in foreign languages. Her Master's degree in anthropology, with a combined emphasis in archeology and ethnobotany, from Tulane University has afforded her the training and skills to work with both present and past cultural groups. She is a Certified Project Archaeology Instructor. Denise has worked in Panama and Peru, advocating cultural patrimony, and on ethnobotanical uses with indigenous tribes. She has conducted botanical surveys in Missouri, Kansas, Panama, and the Peruvian Amazon. Her archeological work ranges from Phase I-III work to artifact cataloging and curation in Arkansas, Kansas, Missouri, and Portugal. Denise's current long-term project is writing an ethnomedicine book on plant use by a variety of specific past and present indigenous groups worldwide in an effort to aid other researchers in this field.

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