

THE KANSAS ANTHROPOLOGIST

JOURNAL OF THE KANSAS ANTHROPOLOGICAL ASSOCIATION

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NOTES ON THE HELTON-HARREL BIFACE CACHE FROM SEWARD COUNTY, KANSAS

Robert J. Mallouf

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NOTES ON THE HELTON-HARREL BIFACE CACHE FROM SEWARD COUNTY, KANSAS

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A prehistoric stone cache of Alibates agate was discovered in 1954 on the southern edge of the Cimarron River basin in southwestern Kansas. The 5 cores and 29 bifacial preforms in the cache were probably made at quarries in or near Alibates National Monument on the Canadian River in Texas, some 175 km south of the cache site. Analysis indicates that two lithic manufacturing techniques--the reduction of thin, flat cobbles and the reduction of large, thick flakes--were employed in the making of the bifacial preforms in the cache. A number of cache discoveries in southwestern Kansas attest to the fact that Alibates agate was highly prized for the production of stone tools by the region's prehistoric inhabitants.

A prehistoric stone cache of bifacial tool preforms and cores was discovered in 1954 near the Cimarron River in Seward County, Kansas (Figure 1). The cache was discovered by Bill and Ima June Helton, longtime residents of Satanta, Kansas, while on a weekend outing on property owned by L.W. "Buck" Harrel of Liberal, Kansas.

The Heltons were walking along the lower slope of a linear dune blowout when they noticed a single large biface exposed on the surface of the ground. When they picked up the biface, a second large biface was found lying immediately beneath the first. Removal of the second biface exposed a dense grouping of more bifaces, which they proceeded to uncover carefully. They unfortunately did not have a camera with them, but they remember the discovery in some detail.

According to the Heltons (personal communication 1990), the cache pit was small, roughly circular, and about 18 in (46 cm) deep. The specimens were all lying flat and were very tightly clustered. The 29 bifaces had been placed immediately above 5 large, heavy cores that apparently formed the bottom lining of the pit. The Heltons relate that the cache appeared to originally have been in some kind

of container, possibly a bag, but they do not recall having seen any soil discoloration or other evidence that might be indicative of a perishable container.

At the time of discovery the dune surface around the cache spot was littered with prehistoric campsite debris, including debitage and scattered burned rock. The Heltons note that they found and collected several arrowpoints and other stone tools from the ground surface in the general vicinity of the cache and that other local residents were known to be surface-collecting the site. They do not remember finding any dartpoints at the site, although they are uncertain about this. Since their 1954 discovery, the Heltons have taken great care of the cache assemblage, keeping the specimens together and well protected.

Discovery of the Helton-Harrel biface cache (now designated 14SW303) is mentioned briefly in the *Kansas Anthropological Association Newsletter* of October 1957 (R. Helton 1957:1). In an article written by Bill Helton's brother, Robert Helton, the Helton-Harrel cache is confused with another cache that also was discovered in Seward County near the Cimarron River in the mid-1950s. This second cache, referred to here as the Sailor-Helton blade

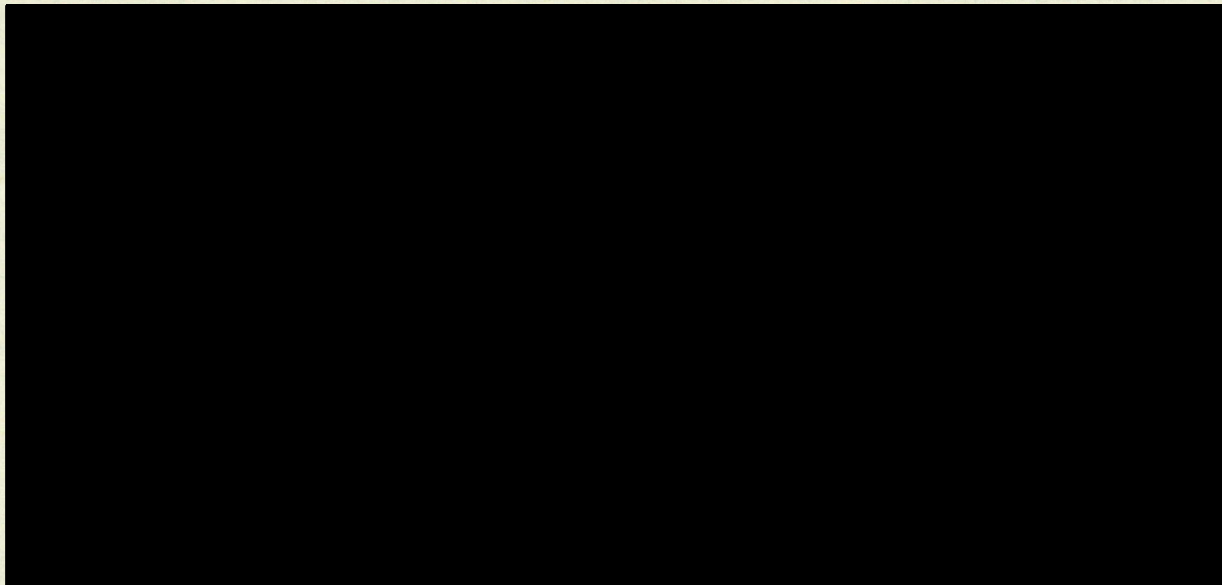


Figure 1. Location of the Helton-Harrel cache site in southwestern Kansas.

cache (14SW302), was found by Raymond Sailor, an area rancher. In his account Robert Helton briefly describes the Helton-Harrel cache find, but he attributes its discovery to Raymond Sailor, thus confusing the two separate cache discoveries as well as their respective contents and locations. The Bill Helton family was actually involved in both finds, thus explaining the mix-up in the published article. Because of resultant discrepancies, it is recommended that the KAA newsletter article be used with caution by future researchers involved in regional cache studies.

The senior author first learned of the Helton-Harrel and Sailor-Helton caches in the Fall of 1989 through Ed Day, archeologist with the Alibates National Monument in Potter County, Texas. Mr. Day had been contacted previously by Bill Helton, who allowed him to examine both artifact collections. Recognizing the significance of the finds and having knowledge of cache studies being performed by the Texas Historical Commission (THC), Mr. Day contacted the author and provided him with photographs of the 2 assemblages. The author in turn contacted Bill Helton and arranged for a loan of the 2 caches to the THC for documentation. As part of the recording procedure, a field trip to southwest Kansas was

made in August 1990 for purposes of interviewing the Heltons and carrying out on-site recordings of both cache find spots. Documentation and analysis of the Sailor-Helton blade cache is currently in progress at the THC. The Helton-Harrel biface cache is briefly described and discussed below.

THE CACHE ENVIRONS

Southwest Kansas is located within the High Plains section of the Great Plains physiographic province (Schoewe 1949:210). This relatively featureless plateau is mantled by a thick layer of Pleistocene-age loess and river valley deposits. It is underlain by the widespread Ogallala formation, consisting mainly of stream-laid sand, gravel, silt, and minor amounts of clay, all reworked sediments of the eroding Rocky Mountains deposited during the Tertiary period. Surface exposures of the Ogallala are confined to eroded areas, primarily along major stream courses, where seeps and springs are also common.

In this region stone sources that could be exploited by aboriginal groups are limited. The Ogallala gravels contain a wide variety of materials, including sandstone, ironstone, quartzite, and some crystalline igneous and

metamorphic rocks, but pebble sizes tend to be relatively small. Localized erratic deposits of chert also occur in calcareous beds of the Ogallala formation. For instance, a 5-ft-thick (1.5 m) seam of milk white chert has been reported in western Clark County, but apparently it is extensively fractured. Day Creek dolomite, sometimes silicified, outcrops in southeastern Mead and Clark counties, but it is not known whether these were quarried prehistorically (Smith 1940:31-32, 45-46).

The Helton-Harrel biface cache was discovered on the lower slope of a large, linear dune blowout in an upland area 5.9 km south of the Cimarron River. During the field visit in August 1990, both Bill and Ima June Helton felt confident that they could relocate within a few meters the approximate horizontal location of the cache spot. The place pointed out by the Heltons is on a gradual slope approximately

3 m above the current floor of the blowout depression (Figure 2).

In 1954 southwest Kansas and surrounding regions were in the midst of a severe drought and were experiencing widespread soil erosion problems. According to the Heltons, the blowout at that time was much larger and had much less vegetative cover than now exists. Today the north-south-oriented blowout is still present, but it is partially filled as a result of natural processes. The surrounding dune system supports a healthy growth of sideoats grama, blue grama, little bluestem, sand bluestem, wild alfalfa, sand dropseed, and a variety of other forbs and grasses (Jack Conover, personal communication 1990). The thick scatter of cultural material that, according to the Heltons, marked the location of a prehistoric campsite here during the mid-1950s is no longer visible, having long



Figure 2. Southeast view across linear blowout (center). White arrow marks find spot of the Helton-Harrel cache.

since been obscured.

The cache spot is located near the eastern edge of an extensive dune system that constitutes the headwater of an unnamed southwest-to-northeast-trending, intermittent tributary of the Cimarron River (Figure 3). The largely stabilized dunes are established in an upland area of Vona series sandy soils (Dickey et al. 1965). This is an area of undulating relief and broad vistas. The cache site is approximately 2 km south of the Cimarron breaks, which form erosionally dissected upland slopes of the Cimarron drainage basin.

DESCRIPTION OF THE CACHE

The Helton-Harrel biface cache is comprised of 5 cores and 29 variably sized bifacial preforms, a total of 34 specimens (Figure 4). The total weight of the cache is 11.18 kg.

All of the cache specimens are manufactured from high quality, aphanic Alibates agatized dolomite (agate), formed by the replacement of the mineral dolomite with silica. Flake scars on both cores and bifaces are free of any adhering concretions, such as calcium carbonate, and are unpatinated. As is

typically the case, the coloration patterns of the agate in the cache vary considerably among individual pieces, but all fall within the known ranges for this kind of stone (e.g., Banks 1990: Appendix A). Based upon rock-color chart (Geological Society of America 1979) comparisons, typical color combinations among the mostly banded artifacts include grayish red (10R 4/2), dusky red (5R 3/4), grayish red purple (5RP 4/2), dark reddish brown (10R 3/4), pale red (5R 8/2), and blackish red (5R 2/2). A single large well made biface (specimen number 6) varies from moderate red (5R 4/6) to very dark red (5R 2/6) and resembles Tecovas jasper. Tecovas is a variety of chert, variegated in color due to iron oxide impurities. Although its origins are distinct from Alibates, the two materials occur in the same general geographic area (Lynn 1986; Mallouf 1989; Banks 1990) and can be similar in appearance, especially in small pieces. Four other specimens, including 3 bifaces and 1 core, exhibit a comparatively homogeneous light bluish gray (5B 7/1) coloration.

Cores (5 specimens - Table 1)

All cores are cobbles that had been tested for quality by the removal of a few flakes and retain large areas of cortex. The specimens range from 141 to 167 mm in maximum length,

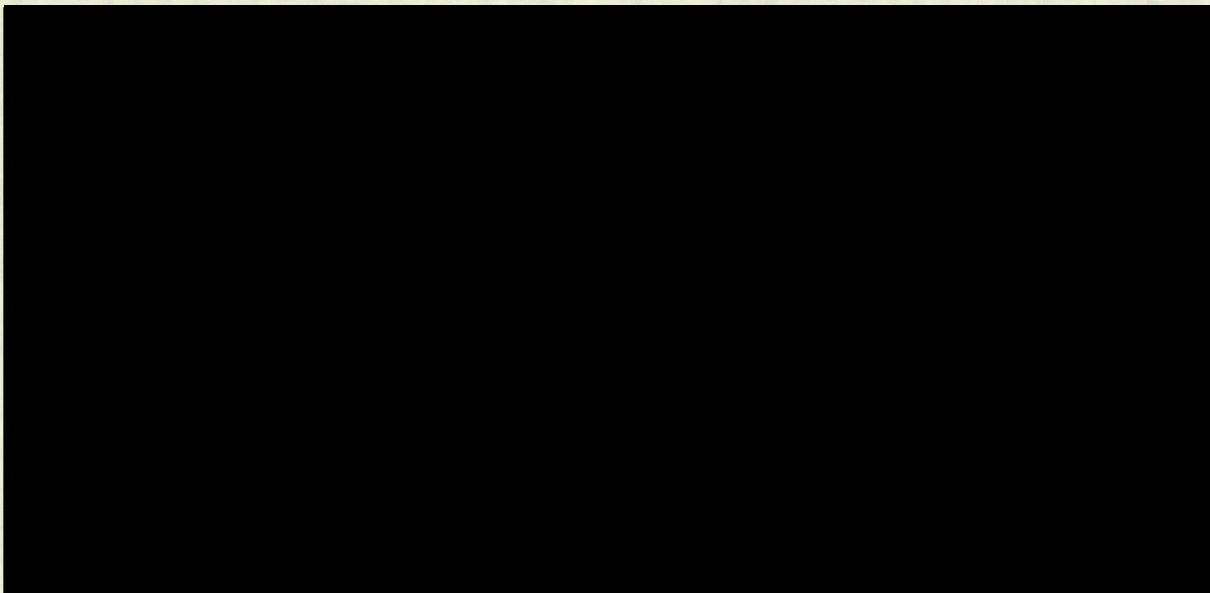


Figure 3. Topographic setting of the Helton-Harrel cache site.

Table 1: Helton-Harrel Biface Cache (14SW303)
Specimen Descriptions and Dimensions*

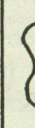
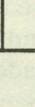
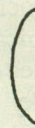
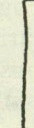
Specimen Nos.	Kind of Specimen	Stone Type	Specimen Shape	Cortex		Maximum Length (mm)	Maximum Width (mm)	Maximum Thickness (mm)	Weight (g)	Cross-sections	Descriptive Terms
				Present/Absent	Approx. %						
1	Core	Alibates	Ovoid	Present	33%	165	102	1680		Cores	
2	Core	Alibates	Boat-Shaped	Present	50%	145	79	1232			
3	Core	Alibates	Boat-Shaped	Present	33%	141	48	896			
4	Core	Alibates	Amorphous	Present	66%	165	74	1008			Ovoid
5	Core	Alibates	Boat-shaped	Present	87%	167	98	1456			
6	Bifacial Preform	Alibates	Subtriangular	Absent		157	95	364			
7	Bifacial Preform	Alibates	Ovate	Absent		157	119	482			
8	Bifacial Preform	Alibates	Pointed-Ovate	Present	4%	133	36	420			
9	Bifacial Preform	Alibates	Ovate	Absent		117	96	392			
10	Bifacial Preform	Alibates	Ovate	Present	1%	115	92	307			
11	Bifacial Preform	Alibates	Ovate	Present	5%	113	81	223			Plano-convex
12	Bifacial Preform	Alibates	Ovate	Present	2%	111	84	247			Lenticular
13	Bifacial Preform	Alibates	Pointed-Ovate	Present	20%	102	87	187			Lenticular
14	Bifacial Preform	Alibates	Ovate	Absent		103	83	199			Lenticular
15	Bifacial Preform	Alibates	Pointed-Ovate	Absent		95	77	139			Lenticular
16	Bifacial Preform	Alibates	Ovate	Absent		97	87	250			Lenticular
17	Bifacial Preform	Alibates	Ovate	Absent		105	80	177			Lenticular
18	Bifacial Preform	Alibates	Pointed-Ovate	Absent		95	63	109			Lenticular
19	Bifacial Preform	Alibates	Pointed-Ovate	Absent		107	73	131			Lenticular
20	Bifacial Preform	Alibates	Subcircular	Absent		83	75	150			Lenticular
21	Bifacial Preform	Alibates	Ovate	Absent	trace	83	67	107			Lenticular
22	Bifacial Preform	Alibates	Pointed-Ovate	Absent		99	75	143			Lenticular
23	Bifacial Preform	Alibates	Pointed-Ovate	Absent		92	64	98			Lenticular
24	Bifacial Preform	Alibates	Pointed-Ovate	Absent		96	66	100			Lenticular
25	Bifacial Preform	Alibates	Subtriangular	Absent		78	60	112			Lenticular
26	Bifacial Preform	Alibates	Pointed-Ovate	Absent		78	64	77			Lenticular
27	Bifacial Preform	Alibates	Pointed-Ovate	Absent		85	51	60			Lenticular
28	Bifacial Preform	Alibates	Subtriangular	Absent		79	62	108			Lenticular
29	Bifacial Preform	Alibates	Ovate	Absent		80	53	82			Lenticular
30	Bifacial Preform	Alibates	Ovate	Present	6%	74	62	98			Lenticular
31	Bifacial Preform	Alibates	Pointed-Ovate	Present	2%	77	60	75			Lenticular
32	Bifacial Preform	Alibates	Pointed-Ovate	Absent		78	59	58			Lenticular
33	Bifacial Preform	Alibates	Ovate	Absent		71	51	43			Lenticular
34	Bifacial Preform	Alibates	Subcircular	Absent		70	69	93			Plano-Convex



Figure 4. The Helton-Harrel cache: cores (top row) and bifacial preforms.

from 74 to 102 mm in maximum thickness, and from 896 to 1,680 g in weight. The average weight is 1,254 g. Three of the cores are roughly boat-shaped in longitudinal cross section, while the remaining 2 are ovoid and amorphous. One of the 3 boat-shaped pieces (specimen number 5) retains up to 85% of its surface cortex, and it had been quality tested through the removal of 6 randomly struck flakes. The other 2 boat-shaped cores (specimen numbers 2 and 3) were intentionally prepared by splitting raw cobbles to create single, flat striking planes that would facilitate the sequential removal of flakes around their circumferences. A series of core preparation flakes were removed from opposite ends of

each of these latter cobbles in order to set up appropriate platform edge angles for the removal of additional flakes.

In sum, all 5 cores appear to have been carefully selected for quality, size, shape, and weight. Subsequent to testing, 2 of the specimens (numbers 2 and 3) were further prepared for future flake production by the creation of single, large striking planes and appropriate core platform edge angles.

Bifacial Preforms (29 specimens - Table 1)

The 29 bifacial preforms in the Helton-

Harrel cache include 12 (41%) ovate, 12 (41%) pointed-ovate, 3 (11%) subtriangular, and 2 (7%) subcircular specimens. Only 7 (24%) retain small remnants of cortex on dorsal and/or ventral surfaces. The remaining specimens have been entirely denuded of cortex. The bifaces range from 70 to 157 mm in length, from 51 to 119 mm in width, from 10 to 36 mm in thickness, and from 43 to 483 g in weight (Table 1). They average 98 mm long, 75 mm wide, 20 mm thick, and 174 g in weight. Twenty-seven (93%) exhibit lenticular cross sections, while the remaining 2 preforms are roughly plano-convex. Manufacturing and/or transport damage is minimal, and, with the exception of 1 specimen (number 13) that is missing its distal tip, all of the artifacts are essentially complete.

The bifaces have rather sinuous, convex lateral edges and have been thinned through the removal of typically broad, flat flakes from the margins of dorsal and ventral faces. Individual thinning flake scars may run across the entire length or breadth of an artifact, and in a few cases outrepasé, or overshot, flakes have removed portions of an edge opposite the striking point. A number of specimens exhibit long thinning flake scars that originate from the distal tips, and in several instances these removal scars have blade-like configurations, being long, narrow, and essentially parallel-sided. The use of lateral edge beveling to maintain appropriate platform surfaces and edge angles is evident on a number of the bifaces, and occasional remnants of edge battering and minor abrasion suggest some purposeful preparation of platforms during thinning procedures. However, evidence for consistently careful platform preparation is generally lacking, as might be expected for an assemblage of early stage preforms or blanks.

One specimen (number 18) in the biface assemblage is distinguished by a 21 mm long area of unifacial retouch and rounding on a lateral margin that may have resulted from its use as a tool. However, subsequent bifacial thinning has removed the majority of this retouched edge. Interestingly, this same biface is manufactured from a distinctive, extremely high quality, purple mottled variety of Alibates

that is only infrequently encountered in stone assemblages of the southern High Plains.

ADDITIONAL TECHNOLOGICAL CONSIDERATIONS

Preliminary examination of the Helton-Harrel cache assemblage suggests that at least two lithic reduction techniques may have been used to manufacture the bifacial preforms. These include the reduction of flat, thin cores directly into bifaces, and the removal of large, thick flakes from blocky cores and subsequent thinning of the flakes into bifaces (Figure 5).

At least 5 (21%) of the 29 bifaces exhibit evidence of having been reduced directly from flat, thin cobbles. These specimens retain small remnants of original cobble cortex and/or thick patina on both their dorsal and ventral faces, and they have relatively straight, rather than curved, longitudinal cross sections. Three (specimen numbers 6, 7, and 8) are among the largest of the cache bifaces (Table 1). All 6 sinuous-edged specimens appear to have been reduced primarily through hard hammer, free-hand percussion, judging from the presence of numerous well defined negative force bulbs along the margins. Other bifaces in the cache probably were made directly from flat cobbles, but they lack the tell-tale cortex remnants that make identification possible.

As many as 12 (52%) of the remaining 23 bifaces in the assemblage display characteristics that indicate manufacture from large, thick flakes. These features include traces of parent flake removal platforms and/or bulbs of percussion and slight, flake-like curvatures in their longitudinal cross sections. Interestingly, at least 7 (58%) of these specimens retain prominent remnants of what are presumed to be the leading edges of prepared core platform planes. It is suspected that they represent thick core rejuvenation flakes, which also were reduced to bifacial preforms (Figure 5). Strong similarities in flaking patterns and edge angles (50°-60°) are evident between the thick platform remnants on the borders of these 7 bifaces (specimen numbers 11, 12, 22, 23, 25, 28, and 32) and the knapped ends of 2 of the boat-

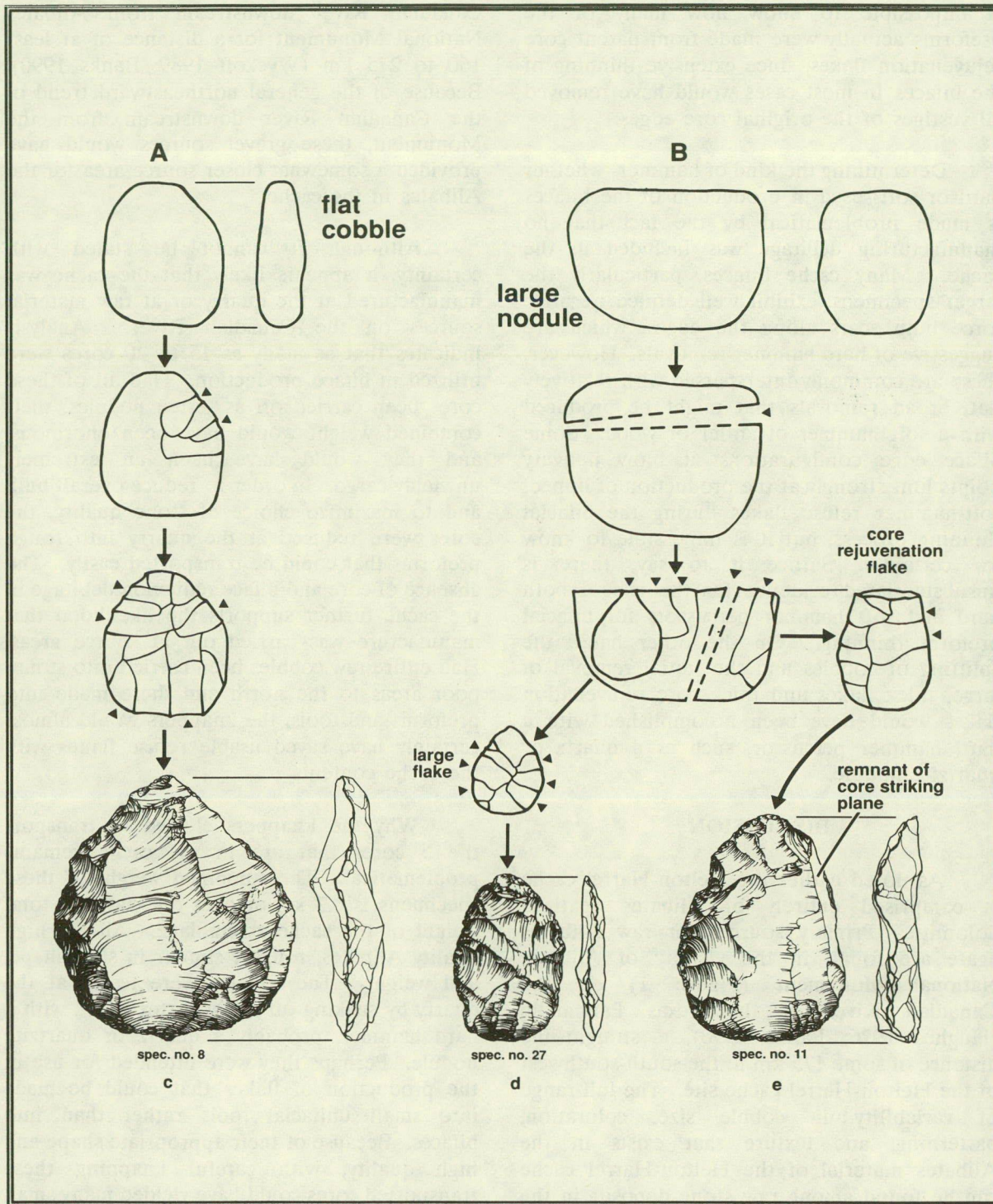


Figure 5. Schematic of biface production techniques used by makers of the Helton-Harrel cache and examples of bifacial preforms in the cache: A) flat cobble reduction techniques; B) thick flake reduction techniques; C-E) cache specimens (about one-third actual size) representing end of reduction sequences. Black triangles indicate examples of percussion points.

shaped cores (specimen numbers 2 and 3). It is impossible to know how many of the preforms actually were made from parent core rejuvenation flakes, since extensive thinning of the bifaces in most cases would have removed all vestiges of the original core edges.

Determining the kind of hammer--whether hard or soft--used in production of the bifaces is made problematical by the fact that no manufacturing debitage was included in the cache. Many cache bifaces, particularly the larger specimens, exhibit well defined negative force bulb scars along the edges, which are suggestive of hard hammer removals. However, these are commonly interspersed with relatively flat, broad removals that might be produced with a soft hammer of antler or wood. Some biface edge configurations at blow delivery points hint strongly at the production of lipped, soft-hammer refuse flakes during the bifacial thinning process, but it is impossible to know for certain. Suffice it to say, there is unsubstantiated evidence for the use of both hard and soft hammer percussors for bifacial preform thinning. On the other hand, the splitting of cobbles and the initial removal of large, thick flakes and thick core rejuvenation flakes would have been accomplished with a hard hammer percussor, such as a quartz or quartzite nodule.

DISCUSSION

As noted earlier the Helton-Harrel cache is comprised entirely of Alibates agatized dolomite. Primary sources for raw Alibates agate are found in the vicinity of Alibates National Monument (Figure 1) on the Canadian River of the Texas Panhandle (Hughes 1976; Banks 1990), a straight-line distance of some 175 km to the south-southwest of the Helton-Harrel cache site. The full range of variability in cobble size, coloration, patterning, and texture that exists in the Alibates material of the Helton-Harrel cache can be found among raw stone deposits in the Alibates National Monument district. Therefore, it is likely that the Monument area was the source of the Alibates in the cache. It should be noted, however, that Alibates cobbles of a size and quality comparable to the 5 cores

in the cache also occur in gravel deposits of the Canadian River downstream from Alibates National Monument for a distance of at least 160 to 275 km (Wyckoff 1989; Banks 1990). Because of the general northeastward trend of the Canadian River downstream from the Monument, these gravel sources would have provided a somewhat closer source area for the Alibates in the cache.

Although it cannot be stated with certainty, it appears likely that the cache was manufactured at the quarry or at raw material sources on the Canadian River. Analysis indicates that as many as 15 to 20 cores were utilized in biface production. Had all of these cores been carried off as tested nodules, their combined weight would have been enormous, and they would have been an extremely unwieldy cargo. In order to reduce overall bulk and to maximize choice of stone quality, the cores were reduced at the quarry into rough preforms that could be transported easily. The absence of core and biface reduction debitage in the cache further supports the likelihood that manufacture was carried out at source areas. Had entire raw cobbles been carried into stone-poor areas to the north and there made into preforms and tools, the knappers would almost certainly have saved usable refuse flakes with the cache contents.

Why the knappers elected to transport the 5 cores that are in the cache remains problematical. The combined weight of these specimens is 6.2 kg, or over one-half the total weight of the cache assemblage. All are high quality Alibates, roughly similar in size, shape, and weight. The cobbles were tested at the quarry by striking off a few cortex flakes with a hard hammer, probably a quartz or quartzite nodule. Perhaps they were intended for use in the production of flakes that could be made into small unifacial tools rather than into bifaces. Because of their appropriate shape and high quality, with careful knapping these transported cores could have yielded many small flake preforms without undue waste of raw material. Or perhaps the raw Alibates was intended for trade, and prior reduction into a particular kind of tool preform would have detracted from its value.

While at the Alibates quarries, the maker(s) of the cache probably carefully selected and tested the cores to be used in production of the bifacial preforms. In a few instances, and particularly for some of the larger bifaces, the knapper(s) struck large, thick flakes off of appropriately sized cores, then thinned and shaped the flakes into preforms through bifacial reduction. In at least a few cases thick rejuvenation flakes were struck from cores and were transformed by thinning into bifacial preforms. All 29 of the bifaces were thinned and shaped by alternately striking off flakes from the dorsal and ventral faces. Direct hard hammer percussion was used for the removal of large, thick flakes and rejuvenation flakes from cores (Figure 5). The reduction of thick flakes into bifaces appears to have been accomplished by direct percussion, using both hard and soft hammers. All of the bifaces, judging by their thicknesses, sinuous edges, and unrefined shapes, were intended as preforms for later reduction into tools, such as knives and projectile points (possibly dartpoints).

Little can be said with respect to the craftsmanship involved in the biface production, particularly since the cache is made up of rough, early to mid-stage preforms. Once the selection of raw cores had been completed, the entire assemblage could have been produced quickly and easily by a single experienced knapper. The overall weight of the cache (11.2 kg), however, would suggest that more than one person was involved in its transport, if not in its manufacture.

The core and preform assemblage may have consisted of more than 34 pieces upon its completion at the quarries, as portions of it could have been used or traded off by its maker(s) during transport. The materials were taken north into a region that lacks good stone resources, at least in regard to large, knappable pieces. Eventually, the core and preform assemblage was cached, possibly in a hide bag or other perishable container, in a shallow, circular pit. The spot chosen for burial of the cache was in what is now a nondescript sandy area, forming the headwater of a tributary to the Cimarron River, some 175 km to the north of the Alibates quarries. Whether or not the

assemblage was actually transported and ultimately cached by its maker(s), or by individuals who had obtained it through trade or other means, can never be ascertained. Also, for reasons that will remain unknown, the person(s) who cached the material never returned to reclaim it.

As noted in an earlier description of the cache location, Bill and Ima June Helton clearly remember the cache spot in 1954 as being surrounded by prehistoric campsite debris, including debitage, burned rock, and Late Prehistoric arrowpoints. Unfortunately, there is no way of determining whether the cache was placed prior to, during, or after occupation of the site, so both its age and cultural affiliation remain unspecified at present. From a purely technological standpoint, the cache is reminiscent of some Late Archaic period (ca. 600 B.C.-A.D. 700) Edwards chert caches that have been found far to the south in Central Texas, but it might just as easily date from earlier or later prehistoric times. A great deal more research will have to be accomplished before it will be feasible to assign tentative ages to biface caches on the basis of technological attributes alone.

Interestingly, the location of the Helton-Harrel cache at the headwater of an intermittent tributary to the Cimarron River may eventually help to define a pattern of lithic caching in the southwest Kansas region. The Sailor-Helton blade cache site, recently recorded on the north side of the Cimarron River in Seward County, is likewise situated at the headwater of an intermittent tributary to the river. The Sailor-Helton cache is comprised of 10 cores and 156 blades and flakes, all of Alibates agate (Mallouf n.d.). Two other recorded caches, one containing 146+ Alibates cores, flakes, and bifaces from Barber County (Stein n.d.) and the other containing some 24 unspecified Alibates "blanks" from Lane County (Thies n.d.a), are also located at or near the headwaters of small tributary streams in southwest Kansas drainage basins. Perhaps placement in these similar headwater topographic settings served as a key to the later relocation of caches. Still another cache, consisting of 30+ Alibates flakes and unifacial

tools, has been recorded in nearby Gray County (Thies n.d.b), but it apparently was found near the interfluvium, rather than the headwater, of two intermittent streams.

According to John Reynolds (personal communication 1990) of the Kansas State Historical Society, 2 additional Alibates caches, one with 91 flakes and tools and the other with 52 flakes and tools, have recently been discovered and professionally excavated by his office at a prehistoric campsite (14CM406) to the east of Seward County in Comanche County (Lees and Reynolds 1989). These finds point out the high degree of variability in cache content across southwest Kansas and adjoining areas, a factor that could prove to have chronological or other significance. As recently pointed out by Stein (1989), even though very little archeological work has yet been conducted in southwestern Kansas, it is now clear that Alibates agate was highly prized for tool making by the region's prehistorical inhabitants. Much additional work with regional caches will need to be carried out in order to identify patterns in their manufacture, transport, placement, and content.

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ARCHEOLOGICAL INVESTIGATIONS AT A MULTICOMPONENT SITE IN NORTHEASTERN KANSAS

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Surface collecting, test excavations, and mechanical stripping were employed to investigate site 14SH4. The site, located north of the Kansas Museum of History, yielded artifacts attributable to the Middle/Late Archaic (Logan Creek), Early Ceramic (Grasshopper Falls), Middle Ceramic (Pomona), and Historic (ca. 1840-1860, Euroamerican and Potawatomi) periods. The presence of obsidian suggests yet another occupation by an as yet unidentified group.

Archeological investigations at 14SH4 were initiated by highway construction on the I-70, I-470 interchange for which fill dirt was needed. The proposed area, located [REDACTED] [REDACTED] was found to be the location of a previously recorded prehistoric site of unknown cultural affiliation (Figure 1). A projectile point and pottery sherds recovered from the Phase II pedestrian survey suggested that the site had been occupied during the Middle or Late Archaic period and, later, in the Middle Ceramic period. Having been tilled for many years, the integrity of the site was suspect.

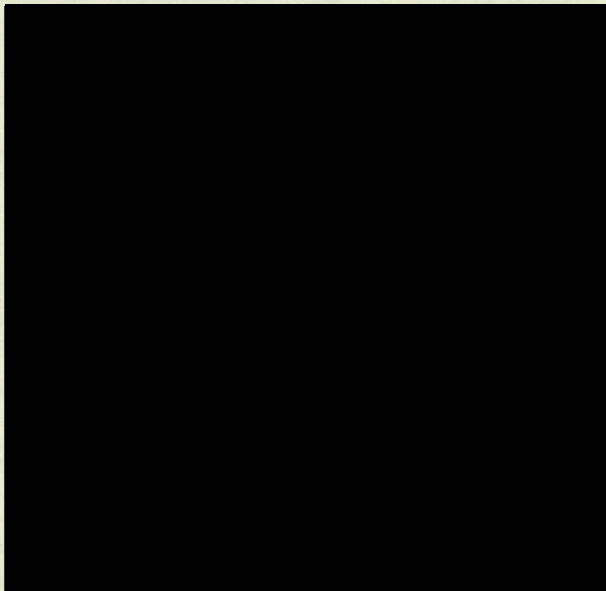


Figure 1. Site 14SH4 lies on topographic rise in center of photo.

Subsequent Phase III work revealed artifacts indicating two, possibly three, other site occupations during the Early Ceramic and Historic periods. Moreover, the presence of obsidian, an exotic trade material, was tantalizing evidence of yet another habitation of the locale. Unfortunately, the presence of 6,000 years of culture history on the surface left little hope that the site would yield intact deposits. Testing at the site reinforced this notion, revealing no undestroyed subsurface features or deposits. Hence, though 14SH4 proved to have an interesting surface assemblage, it was not deemed eligible for the National Register of Historic Places. The site has now been completely destroyed for fill.

ENVIRONMENTAL SETTING

Archeological site 14SH4 was located within the region known as the Central Plains. In general, the Central Plains is that area between the Arkansas River on the south and the Niobrara River in northern Nebraska on the north. The eastern boundary is formed by the Missouri River basin in western Iowa up to its confluence with the Niobrara. The more eastern portion of this region lies within the Central Lowlands, consisting of cuestas and moderately rolling hills, which make up the Osage and Loess plains of Kansas and Nebraska (Schoewe 1949:275). This undulating landscape is a tall grass prairie. The western margin of this region is formed by the foothills of the Rocky Mountains or the Colorado piedmont.

In sum, the Central Plains encompass eastern Colorado, most of Kansas and Nebraska, the western portion of Iowa, and northwestern Missouri.

In physiographic terms, the project area, and hence 14SH4, is located within the Attenuated Drift Border division of the Dissected Till Plains section of the Central Lowland province of the Interior Plains division of North America (Schoewe 1949:280, 291). The Dissected Till Plains is essentially a formerly glaciated northerly extension of the Osage Plains which cover all the rest of eastern Kansas. Most of the Dissected Till Plains is taken up by a glaciated area known as the Kansas Drift Plain. The less heavily glaciated Attenuated Drift Border lies along the southern and western periphery of the Dissected Till Plains in a 25-35 mile (40-50 km) wide strip roughly marked by the Kansas, Big Blue, and Little Blue rivers. Bedrock in the western part of the Dissected Till Plains consists of sedimentary formations of Permian age, while bedrock formations throughout the rest of the area are of Pennsylvanian age. The formations are made up of interstratified beds of limestone, shale, and sandstone, covered over by glacial deposits of varying thicknesses. Loess is also present, occurring as a thin upland mantle over most of northeastern Kansas but in thicknesses of up to 30 m in the bluffs along the Missouri River. The loess thins rapidly away from the river.

The topography of the region is directly related to the degree of glaciation. The heavily glaciated Kansas Drift Plain has a gently undulating erosional drift-controlled surface, while the lightly glaciated Attenuated Drift Border was more rugged, with an erosional rock-controlled surface similar in most respects to that of the Osage Plains. Unlike the latter, which was never glaciated, the Attenuated Drift Border is covered by isolated patches of glacial till and outwash along with scattered boulders, cobbles, and pebbles of ice-transported materials, including quartzites, granites, and diorites brought in from locations well to the north of the state. The resultant topography is less bold than that of the Osage Plains but decidedly rougher and of greater relief than the

Kansas Drift Plain. Within the immediate project area, the most important factor affecting topography is the Kansas River, which lies about one-half mile (.8 km) north. A small, unnamed stream follows the bluff foot one-quarter mile (.4 km) east of the site.

The soils forming the matrix in which site 14SH4 is embedded are soils typically formed on glacially derived deposits. The soils are of the Sharpsburg series, which are well-drained, upland soils found on low slopes in the Kansas River valley. Sharpsburg series soils are slightly acidic. These soils formed on the thin mantle of loess which overlies other loess or tills. Sharpsburg silty clay loam, found on slopes of 1-3%, occurs on the ridge top of this upland setting. Depth of this dark grayish-brown silty clay loam is ca. 38 cm, although its susceptibility to erosion, especially under tillage, will likely alter thickness. Surfaces with slopes of 3-6% are underlain by Sharpsburg silty clay loam as well. However, these silty clay loams tend to be somewhat thinner than those on slopes of 1-3% (Abmeyer and Campbell 1970:22-23).

Judging from soil survey data and early historical accounts, the prehistoric vegetation of the northeast Kansas region consisted almost entirely of prairie cut through by narrow ribbons of riverine forest. According to Kuchler (1974), the potential natural vegetation of most of the area consists of tall grass prairie made up of dense stands of tall and medium tall graminoids, mainly big bluestem and little bluestem. The prairie was cut through by riverine forest vegetation consisting of medium tall to tall broadleaf deciduous forests often containing dense undergrowth and many lianas, occasionally interrupted by freshwater marshes with graminoid communities. Hackberry, cottonwood, willow, and elm are listed as the dominant forest species (Kuchler 1974:600-601), although oak, black walnut, linden, sycamore, locust, hickory, pecan, and other hardwoods could also be found along with smaller forms such as Osage orange, persimmon, papaw, elderberry, serviceberry, chokecherry, and wild grape (Wedel 1959:14).

Prairie vegetation covered the uplands in all but the eastern edge of the Dissected Till Plains, where forested conditions prevailed. According to Kuchler (1974:599), the potential natural vegetation of that area consists of medium tall multilayered broadleaf deciduous forest, with various forms of hickory and oak being the dominant species. The forest was most pervasive on the bluffs along the Missouri River. To the west, the forest/prairie transition was marked by a "mosaic" situation in which forests with islands of prairie gradually changed westward into prairie with islands of forest (Kuchler 1974:588), and finally into prairie with little or no upland forest vegetation.

A large variety of animals were supported by these vegetational conditions. According to Wedel (1959:15), the faunal assemblage of the Dissected Till Plains closely paralleled that found in the Osage Plains to the south. Both areas contained such big game animals as bison, elk, deer, antelope, and black bear. Predators such as cougar, wildcat, timber wolf, coyote, and fox were present as well, along with raccoon, opossum, squirrels, beaver, otter, muskrat, badger, jackrabbit, cottontail rabbit, and various other smaller mammals. Wild turkey, prairie chicken, ruffed grouse, and quail could be found in abundance, while the larger streams yielded an abundance of edible fish and shellfish.

The natural ecology of the region has been greatly altered by modern land-use practices. Today, most of the lands within Shawnee County are used for urban, suburban and agricultural purposes. The site itself lies about one-half to three-quarter miles (.8-1.2 km) north of I-70 and is very near the city of Topeka. The project area is currently in cultivation, the most recent crop being soybeans. As with much land in Shawnee County and the region given over to agriculture the project area has been under tillage for many decades.

CULTURAL BACKGROUND

Archeologically, research in the Attenuated Drift Border region of Kansas has yielded evidence of human occupation dating from

around 12,000 years ago and extending up to the modern era, and certainly has the potential for yielding more evidence. Sites in the region usually represent habitation areas or small workshops and more rarely occur as villages or burial mounds. While the full extent of the area's archeological resources has yet to be determined, it is clear that the region contains materials deriving from all of the major cultural periods thus far identified in Kansas, i.e., Paleoindian, Archaic, Early Ceramic, Middle Ceramic, Late Ceramic, and Historic. The list consists of broad and somewhat artificial categories, and there is some temporal overlap between periods. As might be expected, more is known about the most recent inhabitants than is known about the earliest.

Paleoindian Period

The earliest known inhabitants of the Plains, and by extension, the Attenuated Drift Border are referred to as Paleoindians. Paleoindian occupation of the region is attested to by the presence of isolated projectile points of this period. In other areas of North America, these distinctive, fluted projectile points have been found in association with the remains of a variety of extinct mammals, among them mammoth and early forms of bison. Archeological evidence suggests a lifestyle of small nomadic bands following herds of gregarious herbivores and gathering wild edible foods. No Paleoindian sites warranting excavation have been identified in the Dissected Till Plains, but Reichart (1972, 1981, 1985) has provided some tantalizing clues in the form of surface and gravel bar finds of the distinctive points associated with this period.

Archaic Period

With the extinction of the large megafauna (ca. 8000 B.C) and a warmer climatic trend, an increase in human populations and technological innovation occurred. In this period, known as the Archaic, an increasingly generalized subsistence base continued to focus on hunting and gathering. Game animals were now modern species, and milling stones indicate the first seed processing. The dog had been domesticated and the

chipped tool inventory became increasingly specialized.

Investigations of archeological sites assignable to this period in Kansas are limited. In northeastern Kansas, Archaic sites that have been found have been assigned to a variety of complexes including Logan Creek, Nebo Hill, and Munkers Creek.

Logan Creek is a Middle to Late Archaic complex found in Nebraska, Iowa, and Kansas (Witty 1957; Schmits 1984; Wright 1985; Brown and Simmons 1987:12-2). Logan Creek site 14OS17 has yielded a single thermoluminescent date of about 4420 B.C. Logan Creek dates from Iowa bracket the complex from ca. 6650 to 850 B.C. (Brown and Simmons 1987:12-2). Characteristic chipped stone includes small to medium, basally ground side-notched triangular projectile points, side-notched scrapers, and small scrapers. Pottery does not occur in Logan Creek assemblages.

Other Late Archaic cultures include Nebo Hill, characterized by distinctive lanceolate points and fiber-tempered pottery--the earliest ceramics yet known for the Plains (Reid 1984), and Munkers Creek for which distinctive gouges, points, and knives, as well as anthropomorphic figurines, have been found (Witty 1982).

Early Ceramic Period

Beginning around the time of Christ, Central Plains cultures began to be influenced by technology and ideas associated with Hopewellian affiliated peoples of the Eastern Woodlands. These peoples settled in the Missouri and Kansas river valleys. Important features of Hopewellian culture not yet common to the Plains were pottery making, use of the bow and arrow, planting of cultigens such as corn and squash, and ceremonial burial of the dead. The Kansas City Hopewell, as they are called, were also involved in extensive overland and riverine trade networks over which they acquired such exotic materials as obsidian from northwest Wyoming (Johnson 1979; O'Brien 1984).

The local Archaic cultures were influenced by these new migrants and from the diffusion of ideas from other eastern people. Native, Archaic people who adopted Woodland traits to varied degrees are known as Plains Woodland peoples. These groups lived in small villages or extended communities along the stream valleys. Small short-term camps were apparently used to procure items on a seasonal round. In northeastern Kansas one complex of these Plains Woodland occupants is known archeologically as the Grasshopper Falls phase of the Early Ceramic period (Reynolds 1979).

Grasshopper Falls phase sites generally consist of 1 or 2 houses, likely individual family households, occupying alluvial terraces adjacent to secondary drainages. House structures seem to be of relatively light construction, apparently composed of matted twigs and grass against a superstructure of fairly light poles (Reynolds 1979). Small amounts of daub at the sites suggest that these structures were only partially covered with earth. Houses range from 12 to 24 ft (3.65-7.31 m) in diameter although larger have been suggested. Other structural remains identified at these sites were shallow, trash-filled basins located either within or outside the house structure. Clusters of burned rock found outside the houses were interpreted as hearths.

Pottery vessels of the Grasshopper Falls phase tend to be medium to large, wide-mouthed, conical-based pots, coarsely tempered with angular grit particles and cord-roughened exteriors. Medium-sized, stemmed projectile points as well as small corner and side-notched points were used. Mullers and grinding slabs have been found although ground stone tools were not abundant. The inventory reflects aboriginal inhabitants who were basically hunters and gatherers rather than early horticulturalists as were some of their contemporary Hopewell neighbors.

Middle Ceramic Period

Resultant adaptation and change brought about by new ideas and technologies, the introduction of horticulture, and, one can assume, new social systems of the Early Ceramic period can be observed archeologically

and define the Middle Ceramic period.

Two new house types are found in northeastern Kansas during the period. These were earthlodges of the Central Plains tradition people and the less permanent frame structures, covered with grass thatch and clay daub plastering, of the Pomona focus. The Pomona people are believed to be a distinct and separate group from the Central Plains cultures (Wilmeth 1970). Pomona remains dominant at 14SH4. Witty interpreted the Pomona to be a:

late Plains Woodland manifestation represent possibly earlier population surviving and adapting in place to a secondary subsistence of gardening, in addition to the earlier existing hunting and gathering techniques [Witty 1981:81].

Recently, it has been suggested that the Pomona culture may be ancestral to the Kansa (Johnson 1991). While provocative, this notion requires considerably more research. Dates for Pomona focus sites range from A.D. 1000 to 1600 (Witty 1981:81; Brown 1984:100).

Pomona sites are found throughout eastern Kansas; they lie predominantly in the Osage Cuestas, the Flint Hills, and Dissected Till Plains. Both villages and apparently extended communities are found on the floodplain and on ridge tops overlooking the valleys. The Pomona settlement pattern also includes smaller campsites in similar topographic settings to the villages. These were apparently temporary camps, associated with food gathering activities, or specialized work areas (Thies 1980). A variety of house or specialized structures have been found (Wilmeth 1970; Witty 1981; Brown 1984). The common dwelling structure is oval in floor plan with walls and roof either wholly or partially daub covered.

Pottery vessels of the Pomona focus were small to medium globular jars with indurated clay, weathered shale, grit, crushed sherds, and occasionally crushed, burned bone fragment tempering inclusions and cord-roughened exteriors (Williams 1986). Chipped stone

includes small triangular, plain, or side-notched points; triangular knives; and chipped stone celts. Large, triangular points with corner notches and expanding stems can also be found. Ground stone tools included loaf-shaped, grooved sandstone shaft smoothers. Bone tools are seldom recovered, but bison scapula hoes have been found (Williams 1986).

Late Ceramic and Historic Periods

The Historic period in Kansas is generally defined as beginning with the first recorded exploration of the area by Europeans, which occurred during the Coronado expedition of 1541. The Historic period is characterized by increasing cultural complexity and change in Kansas involving the entrance of numerous European groups into an area occupied by indigenous Native American populations. The result was culture change for all parties.

Native American groups dating from this period have been assigned to the Late Ceramic period by some researchers. They are represented in northeast Kansas by archeological sites attributed to the Kansa and by Oneota sites which are generally believed to be pre-contact Kansa sites (Reynolds 1980; Wedel 1959). The Kansa practiced village horticulture supplemented by a semi-annual bison hunt. Villages ranged in size up to 100 houses which were either earthlodges or bark-covered long houses.

One of these early historic Kansa villages, the Doniphan site, was visited in 1724 by French explorer Etienne Veniard de Bourgmont (Wedel 1959:29). In 1804 Lewis and Clark observed the remains of a Kansa village and a French fort in or near modern-day Atchison County (Moorhouse 1908:339). The fort is now known to have been Fort de Cavagnial, in use by the French as a fur trading outpost between 1744 and 1764 and representing the first documented permanent European settlement in northeastern Kansas (Medsker 1977).

Extensive settlement of northeastern Kansas and Shawnee County by Euroamericans began in the 1820s. In 1827 Cantonment Leavenworth was established on the Missouri

River. In 1830 French merchant Frederick Chouteau established the first trading post and earliest white settlement in Shawnee County on present day Mission Creek. A mission was founded near the trading post in 1835 to minister to the Kansa (Andreas 1883:531). This period saw considerable hostility between white settlers and Native Americans. Moreover, numerous eastern tribes such as the Potawatomi were relocated to reservations in Kansas. The Potawatomi Baptist Manual Labor Training School was established near present Topeka in 1849 (Barr 1977). This site is roughly one-quarter mile (.4 km) south of 14SH4 on the grounds of the present Kansas Museum of History.

Topeka--a name apparently derived from a Kansa word meaning "potato"--was established in 1854 by representatives of the New England Emigrant Aid Society. Settlement began almost immediately and by 1856 it was decided to place the territorial capital in the city. The 1870 population was just over 5,000 persons; by 1880 the population had tripled to 15,452 people (Andreas 1883:539). Population trends have generally been upward and, in addition to being the state capitol, Topeka has become a primary economic center for eastern Kansas.

RESEARCH METHODOLOGY

The Phase III investigation that is the subject of this report initially involved background research consisting of a review of project plans, topographic maps, soil survey maps, and various archeological records pertinent to the project area. Work carried out thereafter consisted of resurvey of the project area, testing with an Oakfield soil sampling tool, and the excavation of 3 test pits.

The night previous to commencement of Phase III investigations, the project area received approximately 1.5 in of rainfall. Hence, archeological work was initially limited to resurvey. One advantage of the heavy rainfall is that many artifacts were exposed; diagnostic artifacts consisting of projectile points and other material such as bifaces, scrapers, pottery sherds, exotic lithic material, and historic ceramics were flagged.

Concentrations of burned limestone were observed and similarly delimited. Over the course of the 2½ days spent in Phase III fieldwork at the site, the entire borrow area was walked at ca. 2 m intervals.

By mid-afternoon drying conditions at the site were such as to allow excavation of a 1 x 1 m test unit (XU1) to begin. Test pits were hand excavated in 10 cm levels using shovels, or where judged necessary by the archeologist, smaller tools such as trowels. Soil from each level was screened using .635 cm wire mesh. Test pits are usually placed in or near artifact concentrations and allow those concentrations to be sampled in a controlled manner. Test pits also permit direct investigations of subsurface deposits. Not infrequently they reveal cultural layers comprised of ash, burned earth, concentrations of artifacts, culturally derived humic deposits, and the like which then form the basis for site evaluations. Test units were established with a north-south orientation with the southwest corner as the datum.

In addition to test unit excavation, mapping of flagged surface artifacts and concentrations was carried out. This involved assigning a feature or "F" number to each artifact or artifact cluster, collecting the artifact(s), numbering the bag in which they were placed with their "F" number, and recording the location with a transit. Transit points were then plotted on graph paper to produce a site map showing significant artifacts, concentrations, and test units (Figure 2).

The second day at 14SH4 found the surface generally dry enough for 2 more 1 x 1 m test units (XU2 & XU3) to be opened. While these 2 units were being dug (excavations of XU1 having been concluded), an Oakfield coring tool was employed in probing the site at ca. 15 m intervals in transects spaced ca. 15 m apart running north-south across the site itself. The tool used for the testing is a simple, hand-operated, probe-type device which can remove intact a soil core 2.5 cm in diameter and about 30 cm in length, and which can be used to obtain soil samples from depths of about 1 m below the ground surface. Soil probing of this type enables an appraisal of subsurface

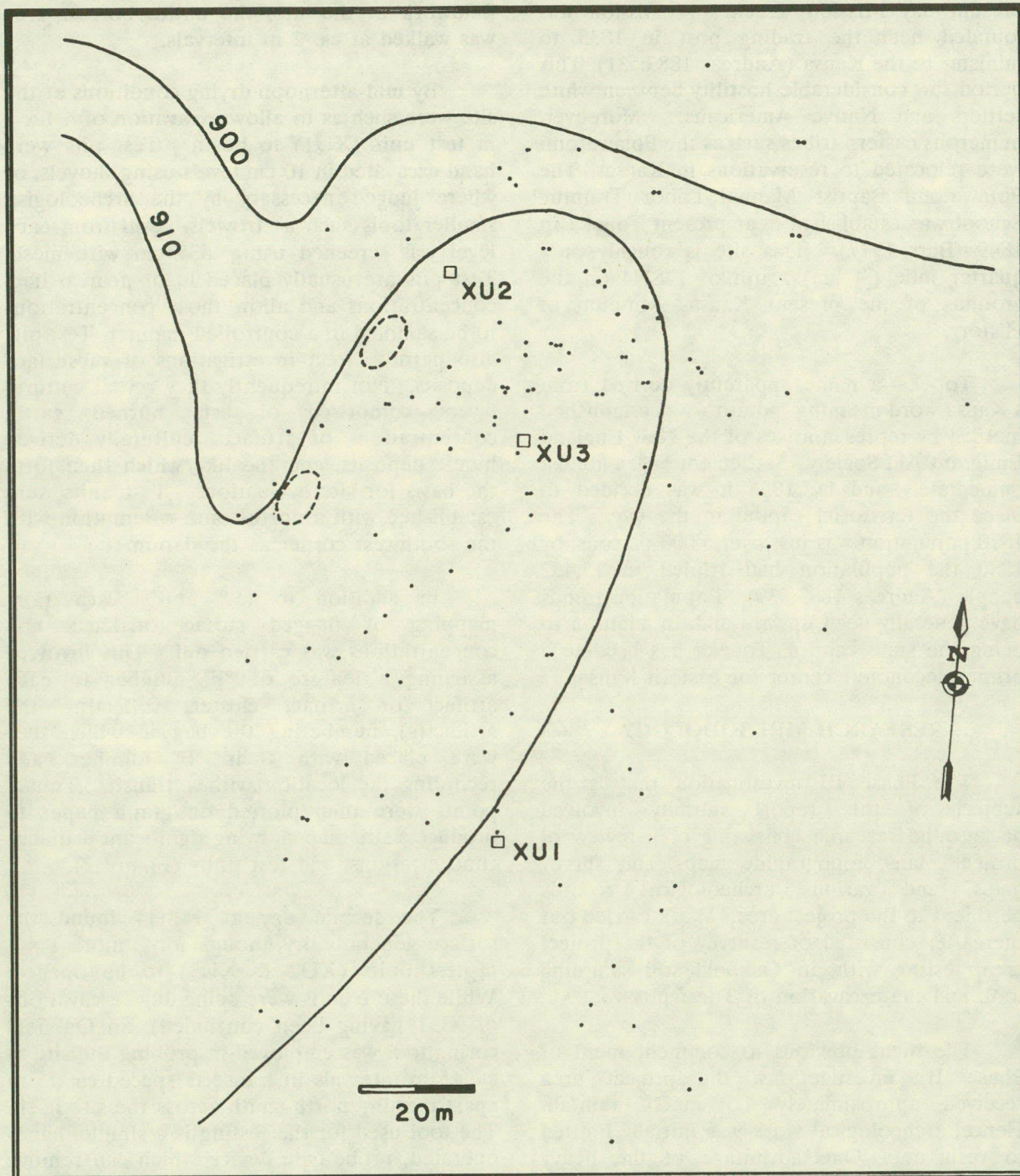


Figure 2. Distribution of artifacts and location of test units. Dashed enclosures are limestone concentrations.

conditions by revealing the presence or absence of charcoal, burned earth, and other such cultural indicators.

The final phase of testing involved mechanical stripping of the plowzone in a portion of the site (Figure 3). Stripping was performed by a road grader. In resorting to mechanical stripping, the purpose is to open a sizeable area of a site quickly. In covering a large area, stripping allows the investigator to see what is below the surface (or below the plowzone, as was the case at 14SH4) over a

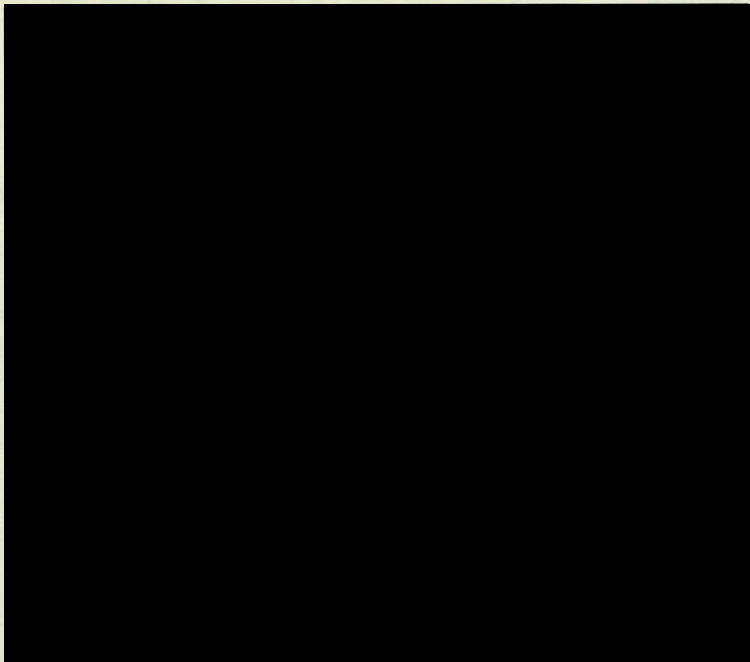


Figure 3. View to east across 14SH4. Stripped area shows clearly to the right. XU-2 backdirt is on the left.

larger area than could be excavated economically using traditional (and preferred) 1 x 1 m test pits or even large-scale block excavations. Archeologically, what is being sought is prehistoric pit or house features or their historic counterparts. Such features, due to their size and depth, often remain intact and show as stains although the remainder of the site has been "plowed out." Oftentimes, such stripping will be used in conjunction with backhoe trenching, which permits exposure of more deeply buried deposits. Since site 14SH4 was situated in an upland setting, it was judged

that the landform was too old to yield buried cultural deposits.

RESEARCH RESULTS

Three 1 x 1 m test units, probing using an Oakfield coring device, and, ultimately, mechanical stripping were used in the search for intact cultural deposits at site 14SH4. Test units XU1, XU2, and XU3 and the stripping of an estimated 225 square meters failed to reveal any subplowzone features or cultural horizons. The results of testing, probing, and stripping will be described briefly below. Cultural material will be described in more detail in a following section.

XU1

This test unit was placed near the southern edge of the site in a concentration of chipped stone debitage. The plowzone was removed as a single stratigraphic unit. The plowzone had a depth of 22 cm below the ground surface. The soil in the plowzone was a wet, silty-clay loam that was very dark brown in color. Small numbers of chert flakes and a few small pottery sherds were recovered. Additionally, some unmodified pebbles were also recovered.

The second level, 22-30 cm below surface, was a subplowzone level. The soil was more clayey, compact, and lighter in color, being a mottled yellowish brown. Culturally, this 8 cm level produced only a few flakes. A strip of very dark brown soil ca. 7 cm wide trending from the south wall to the northeast corner in the east half of the unit was observed. An additional 3 cm of excavation were sufficient to show that this was a filled rodent run and had no cultural significance. These final 3 cm were also culturally sterile, producing no flakes or pottery. No subplowzone features were noted.

XU2

This second test unit was placed near the north edge of the site at the top of the escarpment. A scatter of burned limestone, probably the remains of a plowed-out hearth feature, was located in this area. The 0-10 cm level, comprised mostly of plowzone, was a silty-clay loam. Generally very dark brown, some mottling of lighter brown was observed in the southeast corner. Two plowscars ran north to south across the floor at 10 cm below surface. Recovered cultural material consisted of small flakes and a pottery sherd. Charcoal smudges were noted as being ubiquitous.

The 10-20 cm level also consisted mostly of plowzone soils. In the south half of the unit, yellowish brown clays appeared at ca. 18 cm. Very dark brown, silty clay loam remained in the north half. The north half was then excavated to a final depth of 22 cm when yellowish brown clay was encountered. All cultural material, totalling 7 flakes, was recovered from the dark brown soils. No subplowzone features related to prehistoric occupation of the site were observed.

XU3

This test pit was situated ca. 30 m southeast of XU2 on the crest of the ridge to which 14SH4 is largely confined. XU3 is perhaps 30 to 35 m south of the escarpment edge. A general surface scatter of burned limestone, flakes, and historic material was located in the immediate vicinity. The 0-10 cm level was of very dark brown to very dark grayish brown, silty-clay loam with occasional yellowish clay mottled areas. Being plowzone, the soil was generally loose; rodent disturbance in the west one-half further loosened the soil. Cultural material included both historic glass and ceramics, a nail, a piece of iron, and prehistoric flakes. Small flecks of charcoal were observed throughout.

Level 2, 10-20 cm below surface, produced mixed historic and prehistoric material in a very dark brown to very dark grayish brown silty-clay loam. The soil appeared to be darker than the previous 10 cm level. The soil displayed

some mottling with lighter soil in the north half.

The final 20-30 cm level found a decrease in the amount of cultural material in the unit. Charcoal was noted but was not as prevalent as before. The very dark brown silty-clay loam of the previous level gave way to yellowish brown clays. Rodent activity was extensive. Two areas, the southeast and southwest one-quarter, were probed with the Oakfield corer. The core indicated rodent disturbed darker areas terminating a few centimeters down in yellowish clay. No cultural features or horizons were observed.

Core Probing

As discussed in the previous section on methodology, an Oakfield coring tool was employed in the search for subsurface features. A test was made at ca. 15 m intervals in transects spaced 15 m apart; transects were oriented north-south across only the site area. Hence, the entire proposed borrow area was not probed. With only one exception, all probe holes showed a similar pattern: plowzone, consisting of very dark brown silty-clay loam approximately 5 to 20 cm thick, followed by yellowish brown to yellow clay.

The exception to this was a probe hole near the northwest edge of the escarpment. This core revealed charcoal about 10 cm below the surface. Further probing in the immediate vicinity failed to turn up more, and a non-cultural, or at least non-prehistoric, origin was attributed. A few probes at the foot of the escarpment indicated recent slope wash. This area accordingly received no further coring. Multiple cores were taken in the two large burned limestone scatters but without yielding anything but the standard profile. No subsurface features were indicated.

Mechanical Stripping

After meeting with officials of Clarkson Construction Co., the contractor, on the morning of April 17, 1991, a road grader and skilled operator were brought to the site. Using the grader, the plowzone was removed

from an area near the north edge of the site. Three transects, each ca. 40-45 m in length with an east-west orientation, were scraped. Because there is a limit to how much soil can be easily and efficiently stripped in each pass, 4 passes were made. Eventually, an area the width of a blade was scraped to just below the plowzone. The crew followed behind the blade on each pass to look for any cultural material or signs of features.

The second pass of the blade began to uncover smudges of charcoal. Close inspection indicated that these smudges were extensive. Subsequent grader passes turned up still more charcoal at varying depths in the plowzone. As the material was so widespread, it was suspected that it represented a field burn that had then been tilled under. Oblique orientations of some of the charcoal, which often formed lamellar sheets on clay structures in the plowzone, were taken as proof that the charcoal had indeed been a field burn which was then plowed. The extent of the material precluded its being associated with prehistoric house or pit features. Of course its position in the plowzone further reinforced that idea.

PREHISTORICAL ARTIFACTS

Though subsurface investigations produced comparatively little in the way of cultural material, the surface yielded artifacts in relative abundance. A total of 112 artifact features were mapped. Each feature had from one to as many as a dozen artifacts associated with it. Decades of cultivation have obliterated any obvious patterns in the surface distributions of materials. Plowing is also responsible for bringing to the surface and mixing the artifacts recovered from the site.

Ceramics

A total of 93 prehistoric pottery sherds were recovered from 14SH4. Of these, 21 sherds were recovered from test units; the remaining 72 sherds were collected from the surface. Two of the 72 surface sherds were collected during Phase II investigations. Sherds represent two ceramic traditions: Early Ceramic Grasshopper Falls phase and Middle Ceramic

Pomona focus. Grasshopper Falls ceramics tend to be thick and heavily grit-tempered, while those from the Pomona focus tend to be thinner and have a wide variety of tempering mediums, including grit, sand, grog (crushed sherds), shell, and bone. Pomona focus pottery dominates the collection of sherds from 14SH4.

Of the total number of sherds, 91 (Figure 4a, b) are body sherds and only 2 sherds are from rims. Each sherd was examined for indications of tempering medium. The predominate type of temper represented in the collection is sand, which while varying widely in particle size accounts for 70% of the sherds (n=65). Grit temper accounts for another 22% of the sherds (n=20). A few of these sherds have relatively large amounts of grit (crushed, angular-looking rock). Two sherds have grit and sand in combination. Grog temper is found in only 4 sherds, while shell and bone occur as temper in 1 sherd each. All but 2 or 3 sherds can be attributed to the Pomona focus. Those remaining sherds, which are heavily grit tempered, have been identified as Grasshopper Falls ware (Figure 4g).

None of these tempers is uncommon. A full range of tempers have been observed in both Grasshopper Falls and Pomona ceramics. It is perhaps noteworthy that 70% of the Pomona sherds have sand, either fine or coarse, as temper. Crushed sherds, shell, grit, limonite/hematite, and sand were used as temper at the Keen site, a Pomona site which included Grasshopper Falls wares (Nickel 1973; Witty 1983). At 14AT2, a site with a Grasshopper Falls phase house and Pomona pit features, 67% of the Pomona sherds and virtually all of the Grasshopper Falls phase pottery had grit temper (Williams 1986). The 14SH4 collection had little in the way of grog, shell, or, for that matter, even grit as temper. One sherd had bone, probably burned, as the aplastic inclusion. No limonite/hematite temper was identified in the collection. Both sand and limonite/hematite inclusions in Keen site and 14AT2 ceramics have been interpreted as natural, residual material (Witty 1983; Williams 1986). Its presence in the Pomona sherds from 14SH4 in such a high percentage suggests some degree of intentionality. It cannot be ruled out

that much of the sand, especially the fine material, is naturally occurring.

Surface treatment of sherds, when it could be observed, was either cord-roughened (n=59) or smooth (n=11) (Figure 4d). Because of small sherd size or weathering of sherd surfaces, exterior finish could not be determined in 21 cases. The appearance of cord-roughened sherds is somewhat variable, with cord impressions ranging from being very sharp and clear to having been smoothed over and nearly obliterated (Figure 4e, f). Both cord-roughened and smoothed exterior surfaces occur in Grasshopper Falls and Pomona, although the Grasshopper Falls sherds from 14SH4 were cord-roughened. However, the sample of this material is also very small relative to the 90 or so Pomona sherds. Interior surfaces of all sherds were irregularly smoothed. These surfaces occasionally look like they had been brushed.

Sherd color is not diagnostic. Suffice it to say that the colors of sherds in the collection ranged from black to buff to grayish brown to orange. Exterior and interior color often were markedly different. There is an observed tendency for Pomona ceramics to be grayish brown and have a chalky exterior appearance, especially when compared to Grasshopper Falls sherds (Milton Reichart, personal communication 1991).

Thickness is also not generally diagnostic although it has been used as a means to separate Grasshopper Falls and Pomona ceramics when they co-occur. However, while Grasshopper Falls sherds tend to be thicker overall, mixed collections of sherds of medium thickness could not be separated using thickness. In fact, at 14AT2, "a continuum in appearance between Grasshopper Falls ware and Pomona ware" was noted (Williams 1986:24). Hence,

separating Grasshopper Falls and Pomona components needs to rely on context as well as the artifacts.

Out of 93 sherds from 14SH4, only 2 were rim sherds. One of these was a sand tempered, collared rim sherd (Figure 4a). While not unknown at Pomona sites, collared rims are rare but do occur in Pomona sites in the Perry Lake vicinity, for instance (Witty 1983). The other rim sherd is smaller and is sand tempered as well, though the sand is much finer. Possessing a flat, undecorated lip, it is slightly tapered, thinning at the edge (Figure 4b). Both rims possessed no decoration other than perhaps some cord-roughening on the uncollared rim. Several shoulder fragments indicate vessels with straight or gently outflaring

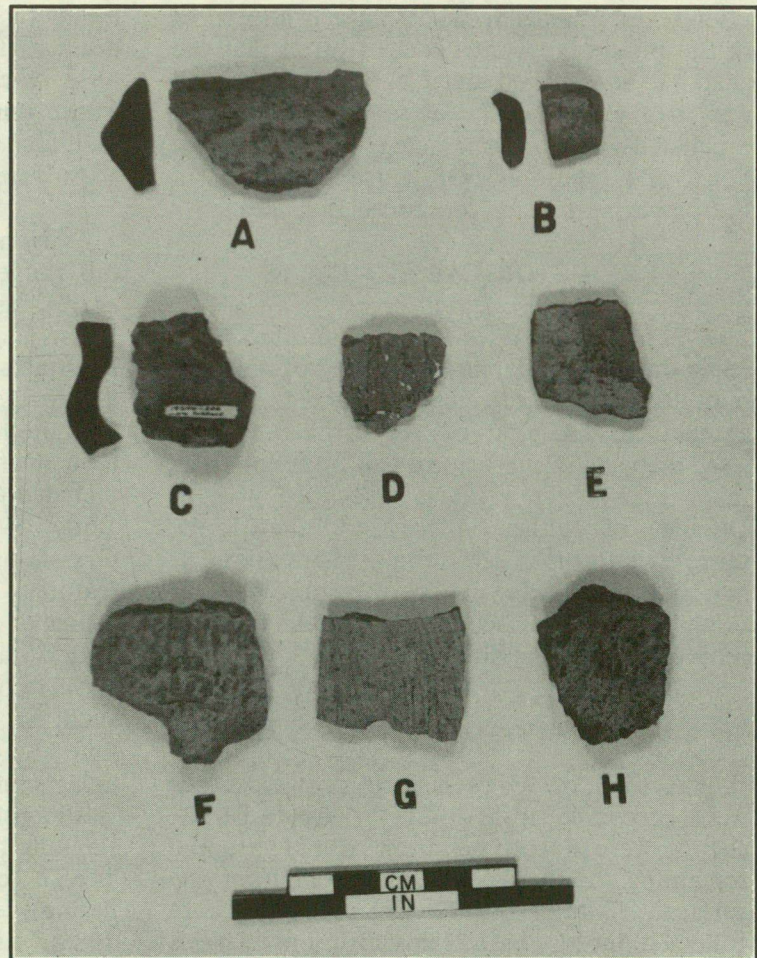


Figure 4. Prehistoric pottery.

rims (Figure 4c). Though these fragments are too small to suggest vessel form, Pomoma vessels are known to be medium to small globular-shaped jars having a constricted mouth (Witty 1983; Williams 1986).

Chipped Stone

With the exception of a few classes of lithic artifacts, it is not yet possible to recognize diagnostic criteria for separating various cultural periods. That is, for such categories as flakes, shatter, chunks, modified/utilized flakes, many forms of bifaces, and cores, archeologists have not yet been able to recognize distinctive attributes which would isolate them to one cultural manifestation or another. Add to this the problems created by thorough mixing of several components, as the three or four prehistoric components at 14SH4, and little choice emerges but to lump these stone materials together by class.

While the ceramics from 14SH4 suggest the site was occupied at least during Early and Middle Ceramic times, the chipped stone, especially the projectile points and some of the raw material, broaden this picture.

Chipped stone tools, or fragments thereof, from 14SH4 number 25. Doubtless the fact that the site has been collected for many years accounts for the relatively low numbers of formal tools and/or complete specimens. Debitage was fairly abundant on the surface of the site and in test units but, since it is not temporally diagnostic, only a sample was collected during this project. The presence of exotic lithic material such as Niobraraite or Republican River jasper, Alibates agate, Mississippian cherts, and, especially, obsidian together with more local cherts gives the collection significance. The nearest source of Niobraraite is western Kansas or southwest Nebraska. Alibates, an agatized dolomite, comes from the Texas Panhandle. The most interesting exotic material is volcanic glass, called obsidian, of which the nearest sources are in the Rocky Mountains.

Frequently, cherts are thermally altered to make them more easily worked. Thermal

alteration was noted in the collection. Determination of heat treatment was made on the basis of color--typically cherts become pink or red--and glossiness on surfaces.

Projectile Points. One complete projectile point and 4 identifiable point fragments were recovered from 14SH4 (Figure 5a-e). All of these were found on the surface. The single complete point was collected during Phase II investigations (Figure 5b). This is a small, side-notched point with a slightly concave base. Lateral margins are straight. The base has been ground which is generally regarded as diagnostic of the Late Archaic period. Size and morphological features are consistent with Logan Creek points from the Logan Creek site, 25BT3 (Witty 1957), as well as 14OS17, an Osage County site identified as being Logan Creek phase. This site has been dated to 4420 B.C. on the basis of thermoluminescent determinations (Wright 1982; Schmits 1984).

A second point, this one missing most of the basal portion, is also a small, triangular, straight-margined, side-notched projectile point (Figure 5a). Like the first point, it is within the range, both in terms of size and shape, of Logan Creek material. The Kansas date of 4420 B.C. for Logan Creek places this complex in the Middle Archaic period; the type site in Nebraska is regarded as being Early Archaic in age. Both of these points are made from Florence chert readily available from outcrops in the Flint Hills.

Three other points in damaged condition were collected. The first of these is a Scallorn-like point, assignable to the Early Ceramic period (Figure 5c). The distal end is missing. What remains is the proximal half, which shows deep side-notching. It is made from Mississippian chert (John Reynolds, personal communication, 1991). The remaining points are Middle Ceramic in age. One is a small, double side-notched, triangular point (Figure 5e). Well made, the distal end has been broken off. This point is manufactured from Winterset chert, a dark gray to black Pennsylvanian chert from the Kansas City locality (Reid 1978). The last point is of an unknown heat treated chert (Figure 5d).

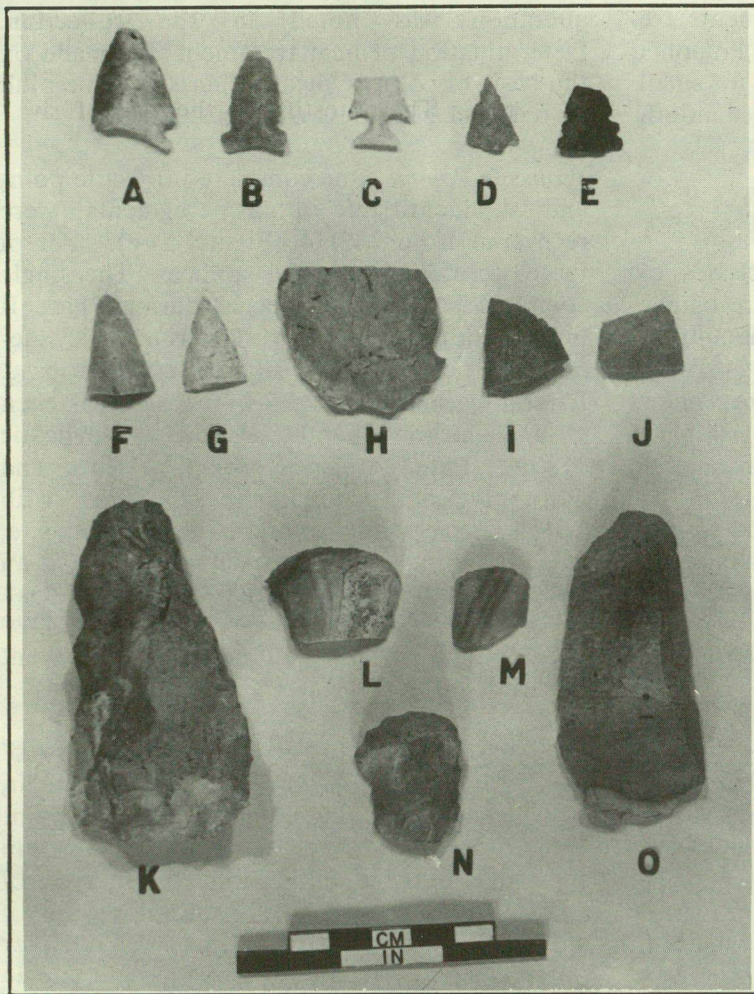


Figure 5. Chipped stone artifacts.

Possibly the raw material was derived from either till or river gravels. Small, side-notched, and triangular, it has been broken below the notches.

Bifaces. Eleven biface fragments and 1 complete biface were found at the site. Bifaces are tools that have flake scars on both dorsal and ventral faces. Bifaces are usually categorized as either thick or thin, based on a length to thickness ratio (Reynolds 1987). Thick bifaces seem "cruder" with a simple arithmetic width to thickness ratio of 3 to 1 or less and thin bifaces a ratio of more than 3 to 1. Thin bifaces have typically been called knives, although they may represent projectile point preforms as well. Thick bifaces are crude and are generally interpreted as blanks or

preforms. The fragmentary condition of the collection from 14SH4 precludes this kind of analysis. The one complete specimen (Figure 5k) is 8.67 cm in length, has a base width of 5.12 cm, a distal end width of 1.74 cm, and is 2.44 cm thick ($W/T=3/1$). This biface might be termed a "celt," although it could be a preform for some other kind of tool.

The remaining 11 biface fragments are all non-diagnostic. Although several of the fragments indicate well-made tools, most were either relatively crude to begin with or have had their appearances drastically altered by breakage and/or burning. Six of the fragments are medial sections (Figure 5i, j). Four of these are Florence cherts, 1 is a buff-colored chert, no doubt derived from a river-rolled cobble, and 1 is a heat treated chert. Heat treating obscures the source, though it is likely made of river cobble chert. Three other biface fragments are proximal or basal fragments (Figure 5h). Two are Florence-type cherts, the third is of an unknown, possibly cobble-derived, thermally altered chert. One of these fragments is reminiscent of a contracting point base, but it is too irregular to be a point base (John Reynolds, personal communication, 1991). A final 2 fragments are distal pieces (Figure 5f, g). One of these is made from a Mississippian chert and the other from a buff-colored, cobble chert.

Scrapers. Scrapers are unifacial tools. Unifacial tools have been modified on only one face. These forms were not plentiful at 14SH4, but a few complete and several fragmentary specimens were recovered. Most of these were collected off the surface, 1 during the earlier Phase II investigations, and the others from the Phase III testing. Only 1, a scraper fragment, came from a test unit.

The 3 complete tools are all fairly large, blocky, plano-triangular endscrapers (Figure 5l, n, o). All 3 were made from Florence-type cherts. Proximal scraper fragments number 2. One of these has been retouched on the lateral margins. These margins converge at the base. This artifact looks to be a fragment of a well worked endscraper. It is made of Florence-type chert. The other is a smaller, plano-triangular fragment of an unknown type of translucent, banded gray chert. There are 2 distal fragments. One is from a relatively large, tabular piece of Florence-type chert. The scraping edge is highly convex, steeply retouched and is the widest part of the otherwise incomplete tool. Finally, there is 1 small, distal fragment of a scraper (Figure 5m). Exposure to intense heat makes it impossible to identify the raw material.

None of these unifacial tools is temporally or culturally diagnostic. Such forms can be found in the Archaic through Historic periods.

Modified/Utilized flakes. Nine artifacts from 14SH4 are modified/utilized flakes, flake fragments, and chunks. Modified flakes are flakes that have been intentionally modified by the flintknapper. Utilized flakes are produced by using flakes directly, without prior modification, as tools. Nondiagnostic, modified and utilized flakes/chunks are lumped together for descriptive purposes. Only 2 of the flakes are definitely Florence-type chert; the rest have been thermally altered and so chert type is no longer obvious in most instances. At least 1 is river cobble derived; quite possibly several others might be. Three flakes are of an unknown translucent gray chert. All of these tools exhibit one or more loci of edge modification or utilization.

Debitage. Flakes (n=93), shatter (n=16), chunks of small cores (n=3); and cobble/cobble fragments (n=10) were collected from both the surface and from test units. Additionally, flakes of exotic material (n=18) were recovered. Approximately one-third of the flakes, shatter, and chunks are Florence-type chert. Much of the rest is either river cobble derived or is unknown chert, some of which is likely from other locally derived sources (e.g., till, etc.).

About one-half of the material has experienced thermal alteration, or, in several instances, been burned. Ten cobbles or cobble fragments were recovered. These testify to the use of river cobbles. All have had flakes removed, though frequently these were not extensive. This activity may represent "testing" of cobbles in the quest for suitable pieces for tools. Several have been heated and/or burned.

Perhaps the most interesting flakes are those of exotic material. There are 6 flakes of obsidian. The obsidian flakes are all black, a couple have faint streaks in them. The largest of the flakes is about 1 cm; none exceed that in size. Sources of obsidian used in Kansas are northwest Wyoming, New Mexico, Idaho, and Utah (Wedel 1959; Hughes and Lees 1991). Apparently, prior to A.D. 1450, Southern Plains groups obtained obsidian from New Mexico, Idaho and Utah; after A.D. 1450 these groups were getting mostly New Mexico obsidian. Whether this model holds true for Central Plains sites remains to be fully tested (Hughes and Lees 1991).

Although the flakes themselves are not culturally or temporally diagnostic, obsidian in Kansas is known to occur in sites attributable to the Early Ceramic Kansas City Hopewell and Cuesta phase, Middle Ceramic Bluff Creek complex in south central Kansas, Late Ceramic/Historic Great Bend Aspect (proto-Wichita) in south central Kansas, Upper Republican (proto-Pawnee) in northwest Kansas, and Dismal River (Apachean) in western Kansas (O'Brien 1984; John Reynolds, personal communication, 1991). There is no evidence for any of these complexes at 14SH4.

Obsidian has not been found in Grasshopper Falls or Pomona sites. Whether this is a rare and hitherto unknown case of one or the other of these groups using obsidian or yet another group not represented in the site collection (or somehow masked) is not known. Possibly there was another culture, such as Kansas City Hopewell, which for some reason is not well represented in the collection at the site. Just as likely is that one of the cultures represented there or another that is not well represented in the collection was interacting

with another group--either Early, Middle, or Late Ceramic--that was using obsidian.

That another group, otherwise not represented in the collection at hand, may have been present is possible. The site is known to have been extensively collected and it is conceivable that diagnostic artifacts representing a "phantom" group were totally collected. A positive source on the obsidian would perhaps do much to clarify the situation.

The presence of alibates (n=2) from the Texas Panhandle and Niobrarite (n=5) from western Kansas and Nebraska, both also brought in over long distances, suggest two possible pathways--south to the ancestral Wichita complexes or west to the Upper Republicans. Alibates is not uncommon in south central Kansas in sites affiliated with the Great Bend Aspect, as well as other groups (Wedel 1959). Niobrarite has also been extensively moved around in prehistory (Reynolds 1990; Hofman 1990). Such materials could possibly have come to the site at the same time as the obsidian.

Other non-local cherts are represented in the collection. Flakes of these cherts (n=5), in addition to the Scallorn-like projectile point fragment, appear to be chert from Mississippian system formations (John Reynolds, personal communication, 1991) which outcrop in Iowa (Morrow 1984) as well as Missouri and Illinois. These cherts, generally white in color with some mottling, are of high quality.

Ground Stone

In this category are 2 metates, or grinding slabs, from the surface of the site. The first of these is a slab of compacted fossiliferous limestone. Measuring approximately 13 cm in length, 11 cm in width, and 4 cm in thickness, it is roughly rectangular in shape. It has been heated at some point in time; heating has imparted a pinkish tint to the stone. A second metate, made of Sioux quartzite, is irregular in shape. It measures 21 cm by 18 cm by 4 cm. It has been heavily ground on one face; this grinding resulted in a slightly concave depression on that face.

The collection from 14SH4 also includes a diorite cobble fragment; it measures 14 cm by 9.5 cm by 4.7 cm. Most of the cobble appears unmodified with the exception of the more rounded face. This area seems to have experienced some amount of grinding.

Hammerstone

A white quartzite cobble with battering on the ends is the only hammerstone found at the site. The cobble measures 7 cm in length by 5.2 cm in width by 3.7 cm in thickness.

Miscellaneous stone

This category of miscellaneous stone includes 1 piece of fire-cracked rock. It is a fragment of Sioux quartzite that has been broken, probably by exposure to heat, and is very angular.

Numerous pieces of limestone, most of which have been burned, were also collected. This limestone is of the same kind as that from which the limestone metate is made. The majority of this material consists of small pieces from the test excavations. A few pieces are from the surface. Burned limestone was scattered all across the site, but two discernible, relatively tight concentrations of it were observed. As was discussed in the section on testing, both concentrations were probed but with inconclusive results. XU2 was placed near the more northerly concentration but yielded little. XU3, while not in either major cluster, produced most of the burned limestone collected from the site. No features were indicated by either test unit or probe holes. The probable source of the materials is hearths that have been plowed out and destroyed.

About 20 small pieces of sandstone were recovered from XU3. Sandstone does not occur locally and must have been carried in, but whether this took place in prehistoric or historic times remains unknown. Sandstone was used by the Native Americans for grinding stones, shaft abraders, etc. Historically, sandstone was often used by Euroamericans as a building material. The presence of suitable building limestone from local sources suggests

that the sandstone may have aboriginal origins at the site.

One large chunk of coarse textured, dark gray stone (basalt?) was collected. It appears that flakes may have been driven from this rock. If it does represent a core, no tools or pieces of debitage of similar material were found. Its large size (11 cm by 8 cm by 6 cm) suggests that it might be a cobble which was "tested" and then rejected and discarded.

Daub

Daub is clay that has been used as plaster on some type of structure. If the structure burned this clay is fired and is preserved as hard clay lumps. Frequently, these lumps preserve wattle (stick), mat, or grass impressions. These materials would have constituted other structural fabric.

About a dozen pieces of daub were collected from 14SH4. Approximately one-half of this material was found in XU3. All are small, being about 1 cm in diameter or smaller. Weathering has left the pieces somewhat rounded; certainly no mat, grass, or stick impressions show. Excavations and mechanical stripping of a portion of the site failed to indicate house features from which this material might emanate.

Shell

A single piece of mussel shell was collected from the surface of the site. Besides sustenance, mussels also provided shell which could be used as scraping, digging, or scooping tools, or could be cut to yield shell beads or discs for ornamentation. Approximately 5 cm in diameter, the shell from 14SH4 has no obvious, intentional modification on it. Edges are rounded, but whether this represents use wear or weathering

is unknown.

Bone

Bone was not observed on the surface of site 14SH4. For whatever reasons, bone does not seem to have been preserved there to any degree. What bone was recovered consists of 6 small pieces of bone. All 6 fragments are under 1 cm in size and, hence, are unidentifiable. Three have been burned and the other 3 have not been burned but are weathered.

HISTORICAL ARTIFACTS

The most recent component of site 14SH4 is of pre-Civil War vintage. Its proximity to the Potawatomi Baptist Mission is highly suggestive. The site was likely associated with the mission, perhaps being a Potawatomi household

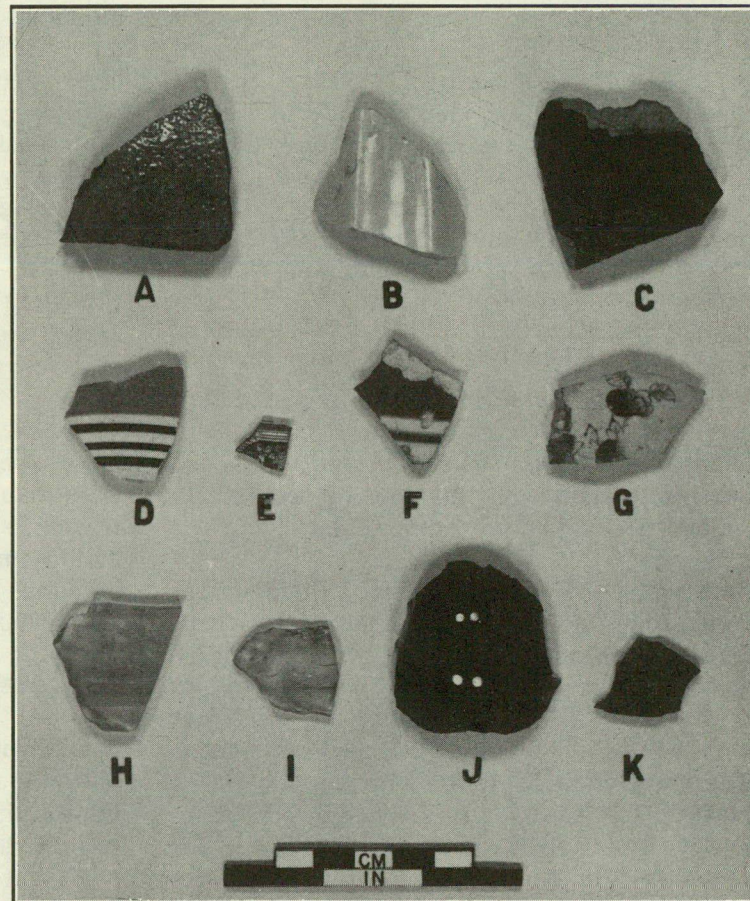


Figure 6. Historical artifacts.

(William Lees, personal communication, 1991). No structural remains are currently present; no trace of any were observed on either the surface or during testing operations. Historic atlases and the site files indicated no structures had existed at the site (Williams 1991), but early structures (i.e., pre-Civil War) are not likely to show on these atlases. Historic material from the site includes ceramics, metal, flat and bottle glass, and a button (Figure 6).

Ceramics

The most diagnostic historic ceramics recovered from 14SH4 were all surface finds and were also mapped. Although a small amount of historic ceramics came from XU3, their highly fragmentary condition rendered them less than diagnostic. Surface ceramics number 11 and of these 7 sherds are highly diagnostic. For classificatory purposes these ceramics are divided into earthenware and stoneware.

Earthenware. Eight earthenware sherds were collected off the surface of 14SH4. Two of these have "annular" or "mocha" decoration (Figure 6d, f). One each of blue and red transfer decorated sherds were present (Figure 6e). A second piece of blue transferware had polychrome handpainted elements (Figure 6g). The 3 other sherds were white, undecorated ironstone (Figure 6b). One of these is a rim sherd.

All but the 3 ironstone fragments are diagnostic of or consistent with a ca. 1820 to 1850 or 1860 date. The ironstone sherds are not inconsistent with this date but could also support a slightly later terminal date.

Stoneware. Three stoneware sherds were collected. One of these is a salt glazed sherd from a thick bodied container, likely a storage vessel (Figure 6a). A second sherd is a bisque type pottery. These two sherds are consistent with a pre-Civil War date but also occur later. The third sherd is from a brown salt glazed bottle. The letters "...REOUS STONE BO..." and "...BOURNE..." are impressed into this sherd (Figure 6c). The inscription indicates that this sherd is a piece of a bulk ink bottle.

Similar vessels were found at Fort Union, North Dakota, and the inscription read "VITREOUS STONE BOTTLE, J. BOURNE & SON, PATENTEES, Denby & Codnor Park Potters, Near Derby, P. & J. ARNOLD, LONDON." The placement of this inscription was near the base of the bottle (Wilson 1981:Fig. 404). There is a second small sherd which probably is a fragment of this same vessel. These bottles were in common use in the mid to late 19th century (Wilson 1981).

Glass

Six pieces of glass were among the historic artifacts retrieved from the site. One fragment was an olive colored bottle base (Figure 6j). Probably this bottle was a wine decanter. Three glass fragments are aqua colored glass (Figure 6h, i). One is simply a sherd of this glass. Another has an unidentified relief molding present. The fragment is too small to indicate the extent or character of the molding. The final aqua sherd shows embossed letters reading "DRY," but again it is so small as to preclude any further identification. The remaining pieces of glass are amber glass. One is a ribbed fragment of bottle. The other shows embossing, but is not large enough to allow the embossing to be identified.

As with the ceramics, the glass is consistent with an early to mid 19th century date. None of the fragments of glass are, however, more precisely diagnostic.

Several other pieces of glass, including a piece of colorless glass from a medicine bottle were found. This latter piece is comparatively recent in age, dating perhaps to the middle 20th century. The other fragments are potentially much older but are too fragmentary to be considered highly diagnostic.

Miscellaneous

In addition to the ceramics and glass, a button, several cut nail fragments, and some nondescript, highly rusted metal fragments were recovered. Most of this material was from XU3, but the porcelain, four-hole button was a surface find. All but the button were highly

fragmentary or rusted and none was considered diagnostic.

Interpretation

The historic component of this site, which on the basis of the ceramics and glass most likely dates to ca. 1840 to 1860 (William Lees, personal communication, 1991), is precisely contemporary with the Potawatomi Baptist Manual Labor Training School, which was in use from ca. 1849-1861 (Barr 1977). There can be little doubt that any contemporary site located less than a quarter mile (.4 km) from the mission could not in some way be associated with it. The most probable explanation is that it is a Potawatomi residence.

Only one such site has been previously investigated, this being 14SH315. Survey, testing, and excavations at this locality some 9 miles (14.4 km) northwest of Topeka on Soldier Creek revealed a possible Potawatomi homestead (Reynolds 1987). Significant cultural remains included a trash filled depression from which Euroamerican and Native American artifacts were recovered. Native American artifacts included 4 hand molded clay figurines. The site was tentatively dated to between 1847 and 1875.

Unfortunately, no items of Native American manufacture were identified in the 14SH4 assemblage. Possibly, the presence of 3 or 4 prehistoric occupations is obscuring Native American items associated with this latest settlement, but this seems doubtful. Certainly, nothing resembling figurines, bone beads, metal projectile points, tinkling cones, trade silver, or other material similar to that found at 14SH315 was observed.

CONCLUSIONS

Investigations at site 14SH4 revealed it to be a much more complex site, at least in terms of the range of cultures and periods represented, than was initially suspected. Four and possibly five periods are indicated on the basis of surface and excavated artifacts: a Middle/Late Archaic complex, tentatively identified as Logan Creek phase; Early Ceramic

Grasshopper Falls phase; Middle Ceramic Pomona focus (or variant, as per Brown 1984); and Historic Euroamerican or, quite possibly, Potawatomi. A fifth possible period is suggested by the presence of obsidian, but there is nothing else in the site collection to point to the identity of this possible fifth, "phantom" culture. Unless the obsidian is assumed to be associated with Grasshopper Falls or Pomona--and no obsidian has yet been recovered from sites of those complexes--then a fifth culture is indicated.

Testing operations, involving mapping, excavation of 3 1 x 1 m test units, probing at 15 m intervals, or mechanical stripping of approximately 225 square meters of the actual hill crest, failed to reveal any structures, pits, or other features which might be associated with any component. While probing in this instance is not the most reliable indicator of subsurface integrity, that all probe cores indicated plowzone overlying yellowish brown to yellow clay is important. It is worth noting that the site was selected by Clarkson Construction Co. on the basis of deep coring. These cores uncovered only yellowish clay to a depth of ca. 6 m (Ron Early, personal communication, 1991). An upland setting, such as that occupied by 14SH4, which has roughly 6,000 years of history on the surface and in the plowzone bespeaks a site long ago destroyed. It was for these reasons that deep testing via backhoe was not employed.

The possibility of buried, intact features and deposits at the site was of the utmost concern, especially in light of Early and Middle Ceramic period artifacts being present in fairly large amounts. However, an attempt to find such deposits by opening a relatively large area on the hill crest using a grader did not reveal any subsurface features. As test units also hit sterile soils below the plowzone, these operations were curtailed.

Ultimately, no significant archeological remains were found within the project area. Although site 14SH4 yielded well over 200 artifacts representing some 6,000 years of history, these were all mixed together on the surface. Below the plowzone site integrity was

judged to be nonexistent. The site was, in the opinion of the archeologists involved, not deemed to be eligible for the National Register of Historic Places. Accordingly, no further investigations were recommended for the project area. Borrowing has since proceeded and 14SH4 is now part of the new I-70, I-470 interchange. Although 14SH4 has been destroyed, the investigation of it added, if only in a limited way, to our stock of knowledge on Kansas prehistory and history.

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BOOK REVIEWS

Mesoamerica's Ancient Cities. WILLIAM M. FERGUSON AND ARTHUR H. ROHN (with photographs by John Q. Royce and William Ferguson, foreword by R.E.W. Adams). University Press of Colorado, Niwot, Colorado, 1990. xiv + 251 pp., plates, glossary, index. \$45.00 (cloth)

Reviewed by John W. Hoopes, University of Kansas.

While the Castillo at Chichén Itzá and the Pyramids of the Sun and Moon at Teotihuacán are familiar to anyone who has dabbled in the archeology of ancient Mexico, these are just the tip of the proverbial iceberg when it comes to the hidden and not-so-hidden treasures of Precolumbian civilizations south of the border. The towering decorative pyramids of Xpuhil, the superbly preserved giant masks of the sun god at Kohunlich, the spectacular murals of Mexican warriors in full regalia at Cacaxtla, and the magnificent plaster statues of the ancient gods of Lambityeco have until now been familiar only to dedicated travellers and scholars of Mesoamerica--and for good reasons. Reaching these sites is usually much more difficult than catching a cab or a minivan from the nearest resort. Even in a car or a bus, access is usually inconvenient (and sometimes impossible) for travellers with limited time or advance planning. With *Mesoamerica's Ancient Cities*, Ferguson and Rohn offer the armchair archeologist a very comfortable flying carpet upon which to visit over fifty of these remote but fascinating places. For those who are interested in touring these Precolumbian sites, it is an invaluable tool for educating the uninitiated travel agent or planning a personalized adventure. For those who study them, it is a treasure-trove of rare and hard-to-obtain views of many archeological sites that have not been widely published.

The civilizations which this volume explores flourished in Mexico, Guatemala, Honduras, and El Salvador over a period of three thousand years prior to the arrival of the Spanish *conquistadores*. The remains of their

art and architecture reveal a culture as rich and detailed as that of ancient Egypt, Greece, or Rome. We have every reason to believe that Mesoamerica was also a land of philosophers, poets, soldiers, and statesmen. Unfortunately, the destruction of thousands of books and documents kept by these ancient people erased a large part of their accomplishments from the annals of history. Rapid advances in the decipherment of Mayan hieroglyphic writing on pottery and sculpture (only four Classic Maya books remain) are helping us to reconstruct the lifestyles of the rich and famous. Other details of their lives must be pieced together from bits of pottery, stone, and charcoal painstakingly recovered by the archeologist's trowel.

Just as modern Europe is characterized by a complex array of languages, governments, and architectural styles, ancient Mesoamerica was also culturally diverse. The Olmecs, Teotihuacanos, Mayas, Zapotecs, Toltecs, and Aztecs, to name just a few of the best known cultures of this region, provided a rich blend of traditions through time and space. While Ferguson and Royce's previous books--*Maya Ruins of Mexico in Color* (University of Oklahoma Press, 1979) and *Maya Ruins of Central America in Color* (University of New Mexico Press, 1984)--focus on the sites of the ancient Maya, *Mesoamerica's Ancient Cities* provides a comprehensive coverage of many different cultures of the entire region. This book will help open the eyes of many to the remarkable variety of Mesoamerican civilizations.

Some of the first aerial photographs of Maya sites were taken by none other than Col. Charles A. Lindbergh and his wife Ann, who offered their services to A.V. Kidder and the Carnegie Institution of Washington in 1929. As anyone who has had to deal with tropical rainforest topography knows, getting around on the ground can be both frustrating and hazardous. Expeditions to Uaxactun in the 1930s required several days of river travel and an eight-day trek by muletrain. The light aircraft was immediately recognized as an

invaluable tool for spotting and visiting remote sites, and since Lindbergh's days it has been a valuable tool for Mesoamerican archeology. Travel by plane, especially one's own, is without question the most efficient way to visit sites in this difficult terrain. There are a number of sites, among them Bonampak and Yaxchilán, which have (grass) airstrips but no motor vehicle access. Others can be reached only by riding for many, many hours over excruciatingly bumpy roads, fording streams, and contending with rickety bridges.

Ferguson, Rohn, and Royce, who have visited more sites by plane than anyone I know has by land, have done a magnificent job of assembling photographs from sites featured in Ferguson and Royce's previous books and combining them with materials from non-Maya sites in Mexico to produce a vivid panorama of the Mesoamerican core. Arthur Rohn, Professor of Anthropology at The Wichita State University, has made a significant contribution to the volume with his expert synthesis of Mesoamerican prehistory and up-to-date discussion of new discoveries in this field. Although his principal area of expertise is the archeology of the American Southwest, Rohn's years of experience in teaching courses on Mesoamerica are readily apparent in a text which is factually correct and accessible to the interested non-specialist.

The book's introductory chapter provides a comprehensive and up-to-date summary of Mesoamerican prehistory, from the arrival of the first Paleoindian hunters through the Spanish conquest. It does a superb job of orienting the reader in time and space, presenting the often confusing terminology ("Preclassic," "Protoclassic," "Classic," and "Postclassic" once implied much more than their current chronological usage) in a fashion that is about as painless as it can be. The authors deserve much credit for high-lighting recent discoveries, including the discoveries of spectacular tombs at Río Azúl, Guatemala, and glyphic texts at Caracol, Belize.

The real value of this book is in its dozens of wonderful aerial photographs, taken over the years by John Royce and William Ferguson in

what must have been hundreds of exhilarating flights (and tricky landings, such as the one described for Yaxchilán). These images are not what come to mind as your typical aerial photograph--a black-and-white image shot from directly overhead at an altitude which converts rivers to ribbons. Rather, these are beautiful full-color, low-altitude, oblique-angle shots. Many were taken at little more than treetop height, just where one would go for a stunning vista of an ancient city! The serenity of these toucan's-eye views belies the engine noise and vibration, not to mention the heat and humidity, that the authors must have endured to obtain these spectacular photos. Although Ferguson and Rohn do not recount what must be the fascinating stories of their expeditions, one can guess from their repeated visits that it must have been more fun than work. I, for one, would have loved to have been along!

Not all of the photos are from the air. Pictures taken on the ground provide many new views of specific details of architecture, sculpture, and murals. Wide-angle, panoramic views of sites like Cholula, Xochicalco, and Monte Albán help the reader to get a good feeling for the settings of these sites, a crucial perspective for appreciating and understanding the principles of Mesoamerican open-air architecture. To help the reader follow what she or he is seeing, the authors have provided invaluable pen-and-ink schematic sketches--drawn by Ethne Barnes from the photographs themselves--to indicate the locations of specific buildings and features. As if this were not enough, the authors also provide reproductions of maps and magical National Geographic watercolor reconstructions for several sites.

The book is filled with information on the people who built and lived in these places, particularly the ancient Maya. While the discussion of the Maya Preclassic is wanting (there is no discussion at all of El Mirador, a major Mesoamerican "city" in Guatemala whose omission from this volume is puzzling) readers will learn a great deal about the deeds and accomplishments of the royalty of the Classic period. These have become known to us through the diligent work in decipherment and iconographic interpretation by scholars like

Tatiana Proskouriakoff, Heinrich Berlin, Floyd Lounsbury, David Kelly, Linda Schele, David Stuart, Peter Mathews, Steve Houston, and Carolyn Tate, to name but a few. The authors provide a few sample translations of hieroglyphs, as well as a useful "deconstruction" of the image on a Maya stela by Linda Schele.

In addition to both the lowland and highland Maya, the volume provides discussions of the cultures of the Valley of Mexico, the Gulf Coast, and the Oaxaca Valley. Descriptions of sites like Teotihuacán, Tula, and Monte Albán summarize the results of decades of research. Short sections on other sites help the reader to understand how they fit together into a colorful mosaic of cultural interaction.

For those with an interest in the ancient cultures of Mesoamerica, this book has something for everyone. Enthusiasts who are just learning about these places will be treated to one of the best available English-language volumes of photographs of Mesoamerican sites. Scholars in the field will appreciate the many new images, especially aerial views, of sites that are infrequently published or appear only in very rare and very expensive Mexican books (even among professionals, I can believe there are only a few people in the world who have actually visited all of these places!). I also believe that this book will have an important historical value. Time will only tell if these sites, the majority of them largely unexcavated and unrestored, will continue to disintegrate under the ravages of looters, deforestation, and natural decay. These photographs have already become part of the irreplaceable record of the remains of a disappearing cultural resource. With luck, continued documentation of these sites will aid in their preservation.

I only have a few complaints about the volume. To be fair, I would first like to note that publications like this with lavish, full-color photographs are very expensive to produce. The authors deserve a great deal of credit for coming out with what is truly a bargain as far as four-color archeology publications go. However, I was disappointed to note that most of the photographs were reproduced with too

much yellow--a problem the printer should have been able to correct. The majority were taken during the dry season, but this can't be the only reason that the tropical vegetation almost never appears in this true emerald green hue. The problem is evident even in photographs of bone-dry Dzibilchaltún (pp. 210-211). Another problem with the photos is that several are simply out of focus (the worst offender is on pp. 231, although the upper photo on pp. 135, especially given its purpose, is a close second). There is no doubt that the authors went to a lot of trouble to obtain these photos, only to discover that the negatives came out a little fuzzy. Still, they might have resisted the temptation to reproduce poor images in large, full-page layouts. A few small problems in typesetting and design are present (there is more on Monte Albán, despite the way the short paragraph looks on pp. 64), but these are relatively minor.

A major difference between books for a popular as opposed to an academic audience is that the latter tend to be more meticulous in leading the reader to additional sources. However, many members of the general audience also appreciate information on other sources! As a reference work (which the photos of over 50 sites clearly make it), this volume would have been even more valuable if the authors had provided either a list of sources for the sites mentioned or a few key bibliographic citations at the end of each section. The two-paragraph description of Chalcatzingo, an important Olmec site, gives no clue that two excellent books have recently been devoted to it. Likewise, the three lavish volumes by Merle Greene Robertson on Palenque, though cited in the bibliography, are not mentioned in the text. These are just a few of many examples. Readers who have their interest in Mesoamerica whetted by the pictures in this book certainly deserve to know that they can find out more about these places--and where they can find it. The book's value lies in the fact that most of the sites in it have not been widely discussed in non-academic literature. However, I believe this is all the more reason for providing the reader with a guide to additional information, most of which is not incomprehensible to the non-specialist.

Lastly, an important addition would have been a guide to pronunciation (to their credit, the authors do provide a glossary). The wealth of information provided in this book will never become a topic of conversation if readers can't speak the names of the places they've read about. The correct pronunciation of Mesoamerican sites and terminology is not always apparent. Unfortunately, pronunciation problems often make it difficult for interested amateurs to feel comfortable with approaching educated professionals. Travellers seeking their way to Xpuhil will have an easier time if they pronounce their "X" as a "sh" and their "i" as "ee". They will also be much more likely to visit Quiriguá if they know how to ask for "Kee-ree-GWAH".

Mesoamerica's Ancient Cities deserves a place on the bookshelf of all Mesoamerican aficionados. As R.E.W. Adams, the archeologist who directed excavations of spectacular painted tombs at Rio Azúl, notes in his foreword: "the text is impressively free of the 'gee-whiz' atmosphere and the pretentiousness that often characterize writing about Mesoamerican archeology for the general public." There are none of the silly rhetorical questions that accompany pseudoscientific speculations about E.T.'s, lost continents, and seafaring Egyptians. Nor is there any hint of ethnocentric wonder that a non-Western people were able to observe the heavens accurately, do accurate mathematical computations, or engineer beautiful buildings. The text also does a remarkable job of avoiding any implications that the people who inhabited these sites are any more "mysterious" than other prehistoric Native Americans. Best of all, it presents these places as they are. In spite of appearances to the contrary, the ancient past of Mesoamerica is not held, literally or intellectually, under lock and key by a closed circle of scholars and wealthy collectors of Precolumbian antiquities. Rather, it invites frequent visits and exploration by any interested traveller, whose chosen mode of transportation may be a plane, a bus, or even an armchair.

Mimbres Archaeology of the Upper Gila, New Mexico. STEPHEN H. LEKSON. University of Arizona Press, Tucson, 1990. x + 117 pp.,

35 figs, 37 tables, appendixes, references, index. \$32.50 (paper).

Reviewed by Jim D. Feagins, Saint Joseph Museum.

The name Mimbres, in the minds of many archeologists and the knowledgeable public, is usually associated with outstanding pottery. The high quality of construction and especially the artistic skills with which they painted motifs on their vessels have generated considerable admiration for Mimbres pottery. While the Classic Black-on-white pots are outstanding, there is considerably more substance to this prehistoric culture than just pretty pots.

The Mimbres area is located in southwestern New Mexico. Earlier research in the area, in the 1920s and 30s, focused primarily on the Mimbres River valley. After somewhat of a hiatus of almost 30 years, Mimbres research again came to prominence. *Mimbres Archaeology of the Upper Gila, New Mexico* mainly describes the excavation of the Saige-McFarland site in Cliff Valley, a segment of the Gila River valley. Nine-miles long, Cliff Valley is at the base of the Mogollon Mountains.

The Saige-McFarland site was partly excavated in 1971-1972. It consists of three or four masonry room blocks (Mimbres phase, A.D. 1000-1150), a Great Kiva (Three Circle phase, A.D. 750-1000), and at least 25 pit house depressions (probably representing the latter phase or earlier). The site may have originally contained 150 rooms. Prior to the excavation, the site had sustained some damage by development and pothunters.

In writing this volume, a considerable amount of detective work was required of Lekson. With the site having been excavated almost 20 years ago, and the notes and artifacts having been subjected to repeated packing, shipping, and use by dozens of people, it is little wonder that the documentation suffered. Some notes, photographs, and parts of collections were missing.

The publication is organized in a rather

typical format for archeological reports. Most of the volume is devoted to artifact descriptions, architecture, and stratigraphy. Portions of three room blocks were excavated. In addition to an over-all description, horizontal floor plans, and many vertical cross-sectional maps, the excavations are generally described in a room by room manner. The few excavated pit houses are also relatively well described in spite of a loss of some field notes and a map.

Ten burials were encountered during the excavations. They were not given as much attention in the publication as this reviewer would have liked. However, an appendix does contain a rather generalized description of their locations and contents.

As would be expected the ceramics occupy the bulk of the artifact descriptions. This section of the text is accompanied by many tables, many excellent drawings of vessel profiles, and many adequate photographs. The other artifacts described (and usually illustrated) include: cores, projectile points, choppers, metates, manos, axes, palette fragments, stone mortars, pipes, stone slabs, and a variety of ornaments (mostly of shell). As with other Mimbres sites in Cliff Valley, hammerstones are rare. No attempt was made to analyze some of the less diagnostic, chipped stone artifacts, such as retouched flakes, etc.

The Saige-McFarland site is compared in a variety of ways with other Mimbres sites in the Upper Gila River valley. The other excavated sites lack the time depth of the Saige-McFarland site. This large multicomponent site was occupied from the Late Pit House period through the Mimbres period, possibly continuing into immediate post-Mimbres times. Lekson uses one chapter to develop a synthesis of the site. Also he uses the site data to help refine and update his ideas concerning Mimbres taxonomy.

This volume is no. 53 of the series *Anthropological Papers of the University of Arizona*. As with other recent volumes of the series, it contains an abstract written in Spanish as well as in English.

The publication's appendices should be useful to other researchers. In addition to the appendix describing the burials, others contain information on analysis methods and basic data concerning ceramic sorting categories, lithic definitions, sherd counts, and other artifact counts.

Mimbres Archaeology of the Upper Gila, New Mexico is generally well written and edited. The Saige-McFarland site has both reaffirmed and added to what is known about Mimbres archeology. Lekson has integrated the site's data with that from other Mimbres sites and his comments on pottery and taxonomy should be of special interest to other Mimbres researchers.

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