

THE KANSAS ANTHROPOLOGIST

JOURNAL OF THE KANSAS ANTHROPOLOGICAL ASSOCIATION

CONTENTS

The Kansa Village According to Lewis and Clark
(Robert L. Thompson and Milton Reichart)

Shadow Glen: A Late Pomona Variant Occupation
in the Lower Kansas River Basin
(Brad Logan and John G. Hedden)

Archeological Investigations at 14DO317,
South Lawrence Trafficway, Douglas County, Kansas
(Timothy Weston)

KANSAS ANTHROPOLOGICAL ASSOCIATION

The Kansas Anthropological Association is the oldest amateur archeological organization in the state. Its membership is made up of individuals and institutions interested in the prehistoric and historic peoples of the area. The objectives and goals of the Association are the preservation and interpretation of archeological and ethnographic remains within the state; the scientific study, investigation, and interpretation of archeological remains and ethnographical materials; the publication and distribution of information concerning Kansas archeology and ethnology; and the development and promotion of a greater public interest and appreciation for the heritage of the state.

Types of memberships and dues:

Individual	\$12.00	Institutional	\$15.00
Family	\$15.00	Life	\$250.00
Contributing	\$20.00	Student	\$5.00

Applications for membership and dues should be addressed to the treasurer at the address listed below. Memberships begin on January 1, and annual dues are payable at that time. Students may join for \$5.00 from June through August of each year; this enables them to attend the annual training program, but it does not include publications.

OFFICERS OF THE KANSAS ANTHROPOLOGICAL ASSOCIATION

President: Ken Sherraden, 760 South Broadway, Salina, KS 67401 (913) 823-4551

First Vice-President: Jean Howell, Bar-H Ranch, Route 1, Coats, KS 67028 (913) 893-2362

Second Vice-President: Dick Keck, 2709 West 74th Street, Prairie Village, KS 66208 (913) 722-1131

Secretary: Sharon Sage, 9130 Southwest 97th Street, Auburn, KS 66402 (913) 256-2409

Treasurer: Vita Tucker, Route 2, Box 213, Burlingame, KS 66413-9583 (913) 654-3640

Historian-Recorder: Mary Conrad, 3900 North 55th Street, Kansas City, KS 66104 (913) 287-4405

Librarian: Don Rowilson, Route 1, Box 57M, Studley, KS 67759 (913) 627-5866

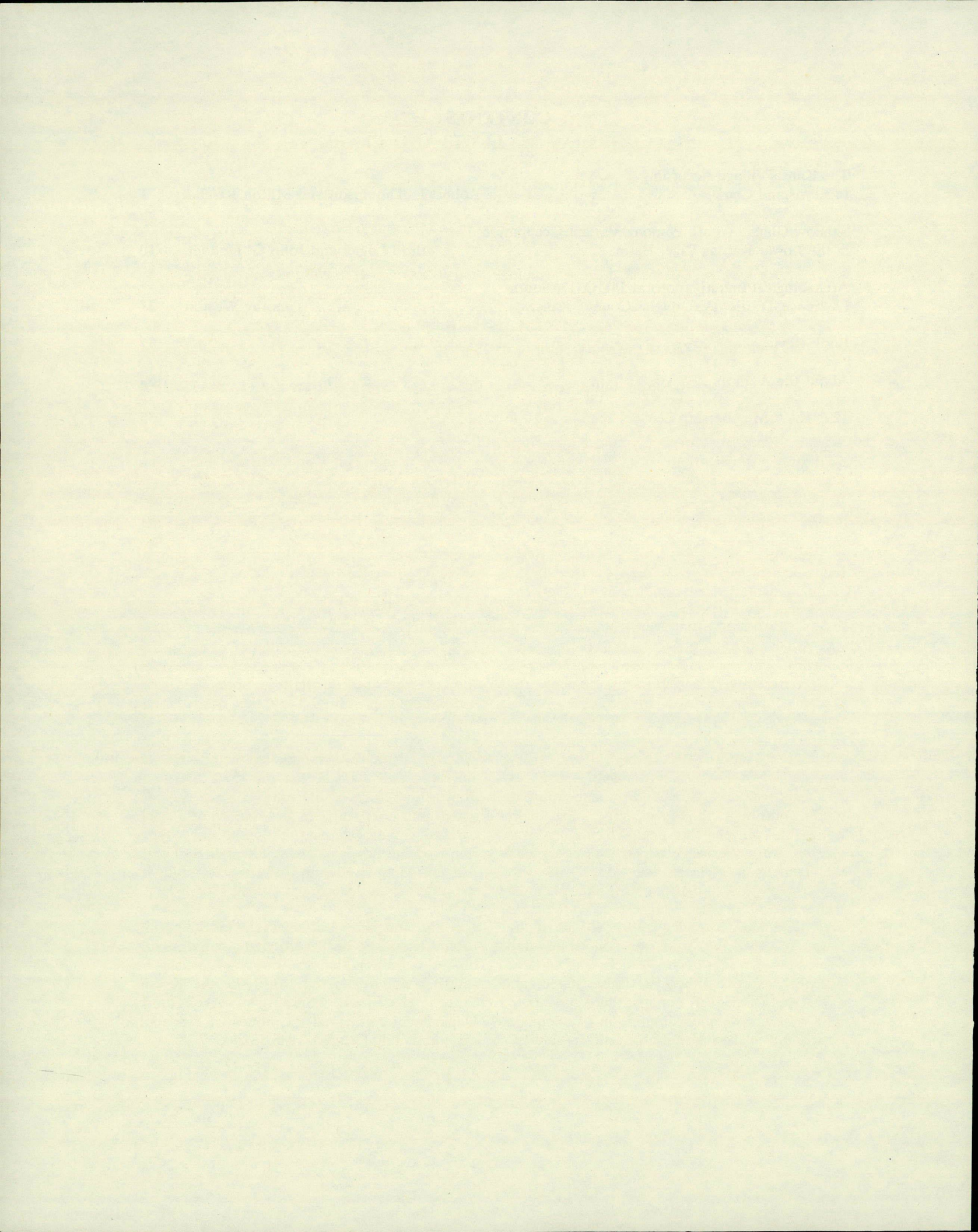
Editor: Virginia A. Wulfkuhle, 120 West 10th Avenue, Topeka, KS 66612-1291 (913) 296-3813

PUBLICATIONS

Each year members will receive six issues of the *Kansas Anthropological Association Newsletter* and two issues of *The Kansas Anthropologist*, the Association's journal. All members and interested individuals, professional or amateur, are invited to submit material to the editor for use in these publications. Five reprints will be provided free of charge to the author of each major article accepted. Additional reprints or back issues of the journal or newsletter, if available, may be ordered from the Historian-Recorder at the address listed above. Prices will be furnished upon request.

CONTENTS

The Kansa Village According to Lewis and Clark	Robert L. Thompson and Milton Reichart	1
Shadow Glen: A Late Pomona Variant Occupation in the Lower Kansas River Basin	Brad Logan and John G. Hedden	10
Archeological Investigations at 14DO317, South Lawrence Trafficway, Douglas County, Kansas	Timothy Weston	31
Book Review		51
About the Authors		53
1993 KAA Membership List		55



THE KANSA VILLAGE ACCORDING TO LEWIS AND CLARK

Robert L. Thompson and Milton Reichart

The Kansas Anthropologist 14(2), 1993, pp. 1-9

The town of Doniphan, Kansas, was long thought to have been the location of the second old Kansa Indian village. The Lewis and Clark Journals actually describe a place for this village downstream about one mile farther, where there is a plain two miles long through which two streams, Fourth of July 1804 (Deer) Creek and Independence Creek flow to join the Missouri River.

Doniphan, Kansas, seven miles upstream from Atchison, has long been considered the location of the second oldest Kansa village. Wedel (1959:29), drawing information from Rensburg's publications of 1911 and 1919, stated, "The exact location of the Kansa Village in Bourgmont's time has been established beyond reasonable doubt."

Wedel (1959:99-106) found little archeological evidence on the west side of the small, unnamed stream that runs through the Doniphan town site, and he was not able to learn of any tradition of ash beds, graves, cache pits, lodge sites or other evidence on the valley bottoms. The graves, lodge sites, and cache pits that he found were on the east slope above the probable perimeter of the town. Local informants spoke of (Wedel 1959:101), "large masses of charcoal, pottery and other burnt substances" exposed by caving of the creek banks, and tipi sites, ash, pottery, stone artifacts, etc. exposed in road building and railroad grading through the town site. Especially noticeable where the school building was erected, were the lodge circles with fire pit in the center. At least one lodge site was supposedly excavated (John Reynolds, personal communication). Wedel suggested that the main area of Indian occupancy lay to the east of the town, or else the evidence was obliterated beneath the present town. Wedel's frustration is probably expressed best in these statements (1959:102), "Curiously enough, there appears to be nowhere a detailed description or adequate illustration of the innumerable artifacts said to

have come from the town site," and (1959:100), "I suspect that the principal village actually lay in the valley."

The cache pits and burials later than Nebraska culture Wedel (1959:112) suggests in all probability ". . . are part of the evidence of a Post-European contact occupancy of some permanence and magnitude. If this reasoning is correct, both caches and burials can hardly be anything other than Kansa. . . ."

Since Wedel's work in the 1930s, some additional excavations have been made. In 1964, faculty members of St. Benedict's College, led by the Art and assistant Latin teacher uncovered the skeletons of three adults and one child. The excavation was initiated by the desire for a human skull to be used as a model for the art class. When the burials were exposed, State Archeologist Tom Witty was contacted. He was surprised and pleased that the work had been done so carefully, which usually is not the case when untrained diggers are involved. After carefully photographing the features, Witty removed the bones of the adult male and child and sent them to Kansas University for study by the physical anthropologist (Witty 1964:6-7).

The landowner had been reluctant to permit the burials to be disturbed, giving consent only on the condition that the bones eventually be returned and reinterred. In 1970, the Kansas State Historical Society's Archeology Department reinterred the bones of the adult male and child (Rogers 1988:58).

A landowner at the Doniphan site (14DP2) in 1987 informed the Archeology Department of the Kansas State Historical Society that human skeletal material was being eroded along a ridge planted in a crop of Christmas trees. Permission for excavation was obtained from the Kansa Tribal Council of Oklahoma, provided that after scientific study and evaluation, all materials would be turned over to the Council for reinterment. Six human burials thought to be Kansa were excavated. In probable association with the skeletal material were shell-tempered sherds and one nearly complete pottery vessel, two sandstone shaft abraders, one bone awl, a catlinite elbow pipe and an engraved tablet of the same material, fragile beads (possible shell), and small white glass beads (Rogers 1988:57-65).

Recently Johnson (1991:57-65) has presented a striking alternative to the interpretation of the post-Nebraska cultural material at Doniphan. The historic Oto tribe to the north belonged to the Chiwere group of Siouan people and, as such, is thought to be derived from Oneota, while the Kansa belonged to the Dhegiha group of Sioux. Johnson's alternative suggests that Doniphan and Fanning in northeast Kansas and King Hill across the river at St. Joseph, previously thought to be Kansa, may actually be Oto. Sometime in the mid-eighteenth century, the Oto came down and drove the Kansa from their village at Doniphan. The latter then moved down the river to the Leavenworth vicinity near the French Fort de Cavagnolle to establish another village. It is not known if the establishment of fort and village was simultaneous, or if one preceded the other. Johnson then suggests that we need not look to Oneota for ancestry for the Kansa; a possible alternative is the Pomona variant of eastern Kansas and western Missouri.

The purpose of this paper is to pinpoint the location of the Kansa Indian village in the Doniphan area by relying principally upon the Journals of the Lewis and Clark Expedition as published by the University of Nebraska Press, unless stated otherwise. Spelling in the Journals was not standard, and the University Press published the words as written, a practice that will be followed in this paper when that source

is quoted, and the misspelled words will not be followed by the customary "(sic)." When stating attribution for the Lewis and Clark Journals, they will be designated "Journals" followed by the page number.

At the conclusion of the journey, Lewis and Clark did not submit a formal report; their numerous unofficial letters served somewhat the same purpose. Then there were their notes and charts, which were expanded into a more complete form. The last entry for September 23, 1806, reads simply, "A fine morning. We commenced writing." A man named Biddle eventually published the journals in a much edited and altered version. Discrepancies and errors are frequent, and sometimes one captain copied the notes of the other. Notes and figuring are scribbled in the margins (Bakeless 1964:XVII). In short, gaining precise information from the journals is fraught with difficulty. Assuming that descriptions of landmarks may be more reliable and consistent, we will try to locate them and ultimately the village of the Kansa.

July 4th Wednesday 1804, Set out early
Came to on the L.S. to Dine & rest a Short
time, pass a Creek on the L.S. about 15
yards wide cuming out of an extensive
Prarie as this Creek has no name, and this
day is the 4th of July, we name this
Independence us. [U.S.] Creek above this
Creek the wood land is about 200 yards,
back of those wood is an extensive Prarie
open and high, which may be Seen six or
seven [miles?] below----(Journals 345-346).
Passed a Creek 12 yds. on L.S. coming out
of an extensive Prarie reaching within 200
yards of the river, as this Creek has no
name, and this being the we Din[e] (on
corn) the 4th of July the day of the
independence of the U.S. call it <Creek
Independence> 4th of July 1804, Creek----
(Journals 345-346).

(2) Passed a Creek 12 yds. wide on the
L.S. coming out of an extensive Prarie
reaching within 200 yards of the river, as
this Creek has no name, and this being the
we Din[e] (on corn) the 4th of July the day
of the independence of the U.S. call it
<Creek Independence> 4th of July 1804,
Creek, (Journals 347).

There is confusion here. Clark gives the name Independence to both of the creeks they passed at the last part of the afternoon of this day.

We came to and camped in the lower edge of a Plain where 2nd old Kansas village formerly stood, above the mouth of a Creek 20 yds wide this creek we call *Creek Independence*....the right fork of Creek Independence Meandering thro: the middle of the Plain a point of high Land near the river givs an allivated Situation. at this place the Kansas Indians formerly lived (Journals 348).

to a pt S.S. opsd (3) Passed a Creek L.S. called Creek of Old Vilg of the Kansies of 30 yd. wide and camped (4) where the old village was on the LS. (Journals 346, from the notes).

Thwaites (1904:66-67) renders this version: "Passed a creek 12 yds wide on the L.S. Coming out of an extensive Prairie reching within 200 yards of the river, as this creek has no name, and this being the 4th of July the day of independence of the U.S. call it 4th of July 1804 creek."

To clarify matters, they passed a creek 12 or 15 yards wide, which they named Fourth of July Creek. Next they passed a creek 20 or 30 yards wide, which they called Independence Creek. The first creek we believe is Deer Creek; the second creek is the one that still bears the name Independence. An informal eyeballing of the two streams at the present time indicates that the ratio of their size, either 15 to 30 or 12 to 20, is about right.

Capt. Lewis walked on Shore and Saw a large moun[d] & 3 roads leading (Journals 346).

Capt. Lewis walked on Shore above this Creek and discovered a high moun from the top of which he had an extensive view, 3 paths Concentering at the moun (Journals 347).

A point of high land near the river givs an allivated Situation. at this place the Kansas Indians formerly lived (Journal 348).

Temple mounds, graves or other earth works were no strangers to Lewis and Clark, those features being numerous in eastern United States. Indeed, Lewis had a close relationship to his patron, Thomas Jefferson, who is one of the first, if not the first, to apply the principals of stratigraphy in excavation (Hole and Heizer 1973:63). Jefferson is regarded as the father of *American archeology*. There is no indication that this large mound or high point is anything other than natural. Over a mile southwest of the town site of Doniphan, jutting out about 50 ft above the plain, is a rounded hill. At the present time, there is a house atop this feature (Figure 1), and formerly there was also a barn. This elevation gives a splendid view for over a mile to the southwest up the valley of Deer Creek. To the northwest, one can see nearly a mile to the junction of Independence Creek and its smaller fork, Rock Creek, then up Rock Creek nearly another mile farther. To the east one looks out onto the Missouri River flood plain. The view is spectacular, really more impressive than the view from the higher elevations to the west. The journal writers waxed rapturously over this view:

We camped in the plain one of the most butiful Plains, I ever Saw, Open & butiful diversified with hills & vallies all presenting themselves to the river covered with grass and a few scattering trees a hansom Creek meandering thro at this place Kansaw Inds. formerly lived and had a verry large Town passed a Creek (4) I observed Spring breaking out of the bank, A good Situation for a fort on a hill at the upper part: (Journals 346).

The Plains of this countrey are covered with a Leek Green Grass, well calculated for the sweetest and most nourishing hay --- interspersed with Cops [copses] of trees, Spreding ther lofty branches over Pools Springs or Brooks of fine water. Groops of Shrubs covered with the most delicious froot is to be seen in every direction, and nature appears to have exerted herself to butify the Senery in every direction, and nature appears to have exerted herself to butify the Senery by the variety of flours raiseing Delicately and highly flavered raised above the Grass, which Strikes & profumes the Sensation, and amuses the mind throws it

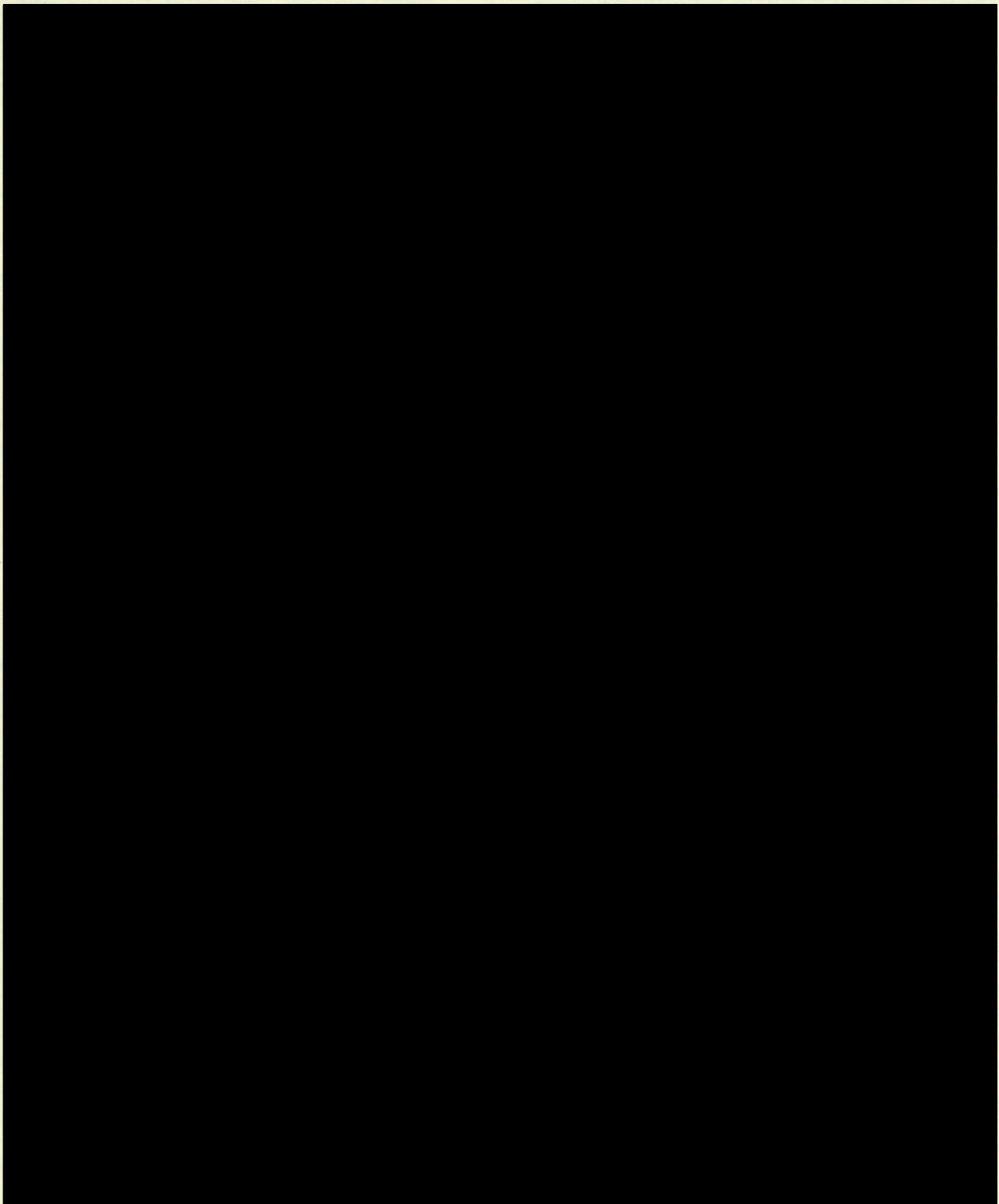


Figure 1. Doniphan and environs. Small black squares (■) represent houses, barns, and other significant buildings. (Adapted from Atchison NE, Kans.-Mo. 1959, Photorevised 1972, and Atchison East, Kans.-Mo. 1984, 7.5 Minute Series [Topographic], United States Department of the Interior Geological Survey.

into Conjecterng the cause of So magnificent Senery [several words illegible, crossed out] in a Country thus Situated far removed from the Sivilised world to be enjoyed by noth - (Journals 346) ing but the Buffalo Elk Deer & Bear in which it abounds & [page torn] Savage Indians (Journals 347).

we camped in the pla[i]ns one of the most beautiful places I ever saw in my life, open and beautifully Diversified with hills & vallies all presenting themselves to the River (Quaife 1916:92, from the entry for July 4th in the Journal of Sergeant Ordway, a member of the Lewis and Clark Expedition).

The "3 roads leading" (Journals 346) or "3 paths concentrating at the moun" (Journals 347) suggest that this mound very likely served some important function for the tribe. Why are there three roads and not some other number, say one or six (see Figure 2)? Might this mound have been an assembly point for the village extending for about two miles on the plain at the foot of the mound? From the top of the mound which is centrally located, one can see the full extent of the village. The Bourgmont Journal (Norell 1988:134) lends credence to this interpretation: "Monday, 24 (July). We begin to load our horses at four this morning. The Kansa chiefs came to our camp and had their young people take the bundels that we had not yet loaded and carry them, along with the knapsacks of the soldiers. We left at six, with drum beating, flag flying, and with all our firearms and baggage. We formed up on the high ground of the village, and then the drum began to beat a marching rhythm, and we set off." (Underlining added.)

Margray (1886:411) records the underlined phrase in the original French thus: *sur la hauteur du village*. Norell's translation of "hauteur" as "high ground" is correct. However, the adjective "high" does not appear in the original French but is implicit in the word itself. "High ground" is quite general and vague; two other meanings of the word with greater specificity are "eminence" and "hill" (Dubois et al. 1960). The latter two meanings seem to be in greater harmony with "mound" and "high point" than with the more general "high ground."

After leaving the village area, the Bourgmont expedition marched only a league and a half and went into camp. The Kansa chief told Bourgmont that this was their assembly (staging?) area where the stragglers could catch up. One of Bourgmont's leagues was approximately 2½ airline miles when measured on a map (Reichart 1977-78:15). Norell (1988:172) concurred, "The author arrives at a working formula: 1 Bourgmont league = a scant 2½ airline miles. If we add a bit to allow for uneven terrain, we will not be far from the 2.76 miles equaling one *lieue commune*."

From the Kansa village about 1½ leagues (approximately 4 miles) southwest along Deer Creek, Indian artifacts can be found. However, small tributary streams along the Missouri River were quite thickly populated with Indians at various times, so it would be difficult to separate Kansa artifacts from materials of other cultures. The point we make is simply that the Kansa had an assembly point somewhere along Deer Creek. Therefore by inference, the mound adjacent to the Kansa village could have served that purpose as well at a closer location. On the mound itself, there are several shallow grooves leading upward, but the area was cultivated for an unknown length of time. At present, it supports a cover of brome grass, and those slight traces are most likely livestock paths and/or traces made by farm machinery.

On the 3rd of July, Lewis and Clark discovered a fat, tame, Indian horse, which they took along with them. On the evening of the 4th of July, they camped along the river (on the Missouri side) across from, or a little above, the mouth of Independence creek, which meanders across the plain at the bottom of which is the old Kansa village.

Set out very early (July 5th.), Swam the horse across the river, proceeded on for two miles under the bank where the old Kansas town formerly stood (Journals 350).

Set out very early, proceeded near the bank where the old village stood for two miles, (Swam the hors found a few days ago) (Journals 350-351).

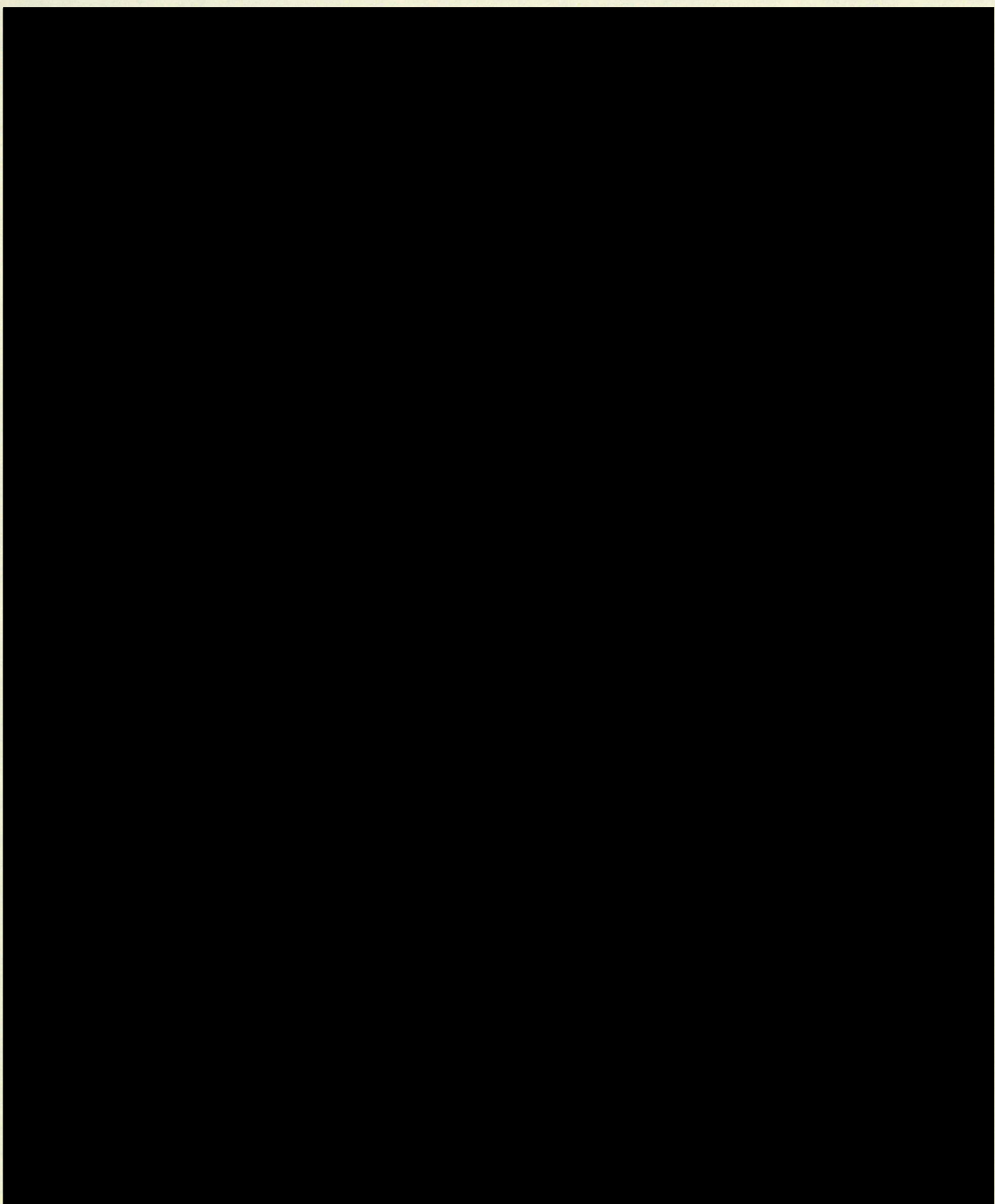


Figure 2. Hypothetical Doniphan and environs, 1804. (Adapted from Atchison NE, Kans.-Mo. 1959, Photorevised 1972, and Atchison East, Kans.-Mo. 1984, 7.5 Minute Series [Topographic], United States Department of the Interior Geological Survey.)

Thursday July 5th 1804. we Set out verry early. we Swam the white horse a cross this River, proceeded on for two miles under the bank where the old Kansas Town formerly Stood (Quaife 1916:92, from the entry for July 5th in the Journal of Sergeant Ordway, a member of the Lewis and Clark Expedition).

The picture that emerges now is of an Indian village two miles long immediately above the west cutbank of the Missouri River. The camp of July 4th, as noted, was probably across from about the midpoint of the village and of the mouth of Independence Creek. In swimming a horse, even a fat, tame, Indian one, across a river as large as the Missouri, one does not cross perpendicular to the force of the current but crosses at an angle. Starting from the camp, on the morning of the 5th, the horse and rider probably landed on the west side at the lower extent of the Kansa village, or even slightly lower than that. Thus, they went up the full two-mile extent of the village.

With the aid of the Lewis and Clark journals, we believe we have found the stage upon which the Kansa Indians, Bourgmont, and Lewis and Clark played out their roles. But we have not found the most important prop--the Kansa village.

Until the Corp of Engineers stabilized the channel of the Missouri River for shipping and other purposes, the "Big Muddy" was noted for a channel migrating back and forth across the wide valley over time. The town of Doniphan (Wedel 1959:98-99) was a port city in the 1850s and 1860s until it was eclipsed by Atchison and deserted by the river which moved farther out into the valley.

It is very likely that this second Kansa village site suffered the same fate that is attributed to the first Kansa village site at the Leavenworth vicinity. Lewis and Clark gave their observations of this latter location:

. . .we camped after dark on the S.S. opposite the 1st. old village of the Kansas which was Situated in a Valley between two points of high land, on the river back of their village commenced an extensive Prarie

<the French> a large Island in front which appears to have made on that Side and thrown the Current of the river against the place the Village formerly Stood and washes away the bank in that part (Journal 341).

. . .we Camped after dark on the S.S. above the Island and opposit the 1st old village of the Kanzes which was Situated in a valley, between two points of high land, and imediatly on the river bank, back of the village and on riseing ground at about one mile The French had a garrison for Some time and made use of the water out of a spring running into Turkey Creek, an extensive Prarie, as the current of the river Sets against the banke and washes it away. . . (Journal 342).

The first old Kansa village was established on the floodplain. Had the second old Kansa village been established on a floodplain too? After leaving the Missouri River, the Kansa appear to favor floodplain locations for their settlements. A noted exception is Hard Chief's village (14SH301), located on a ridge top west of Topeka, Kansas. As noted earlier, Johnson suggested that Fanning, King Hill, and Doniphan may have been Oto. The first two sites have upland locations. Where the town site of Doniphan reaches junction with the Missouri River floodplain, the elevation is 812 ft. At our proposed location for the Kansa village, the elevation is 800 ft (USGS map 7.5 minute, Atchison NE). The upper valley part of Doniphan is considerably higher than the lower, and if the village extended along east of Doniphan, as Wedel thought possible, then that is higher still. So the town site of Doniphan is not a floodplain location. In that respect it is perhaps more like Fanning and King Hill than like the first Kansa village and our location for the second. (Note: "First" and "second" applied to the Kansa villages do not denote chronology, but locality. When traveling up the Missouri River, the "first" Kansa village was the first to be encountered north of the mouth of the Kansas River, and the "second" village was the one farther up at Doniphan. The second village was established first, and first was established last.)

That there were/are Indian habitations, storage pits, and graves at the town site of

Doniphan is incontrovertible, but the journals do not describe that location for the Kansa village. The stream that runs through Doniphan is so small that it lacks a name (USGS 7.5 minute Atchison NE). The Kansa village is placed by the journals where the right fork of Independence creek meanders across a floodplain two miles long. The town of Doniphan is definitely not at the bottom of so large a plain. It nestles at the lower reaches of a very small valley between two high ridges. There is no large mound there, and the view from any place in Doniphan, while not shabby by any means, does not measure up to the aspect from the location we have proposed.

We do not maintain that the Doniphan site was/is completely lacking features attributable to the Kansa. Perhaps at that location some ancillary activities of the village downstream were carried out.

Along the lower reaches of Deer Creek, there are four known archeological Indian sites: 14AT441, 14AT338, 14AT444, and 14AT445 (Thompson 1993:15). These sites have not been defined any more than Ceramic. Are they perhaps remnants of the outer fringes of the Kansa village location? The fact that they were not obliterated by the flooding Missouri indicates that they were far enough away not to be totally impacted.

To assert that the location we propose for the Kansa village was here, but flooding and bank caving obliterated all evidence, might seem to be a blatant, specious "begging of the questions." However, Independence Creek with its fork is still here. Likewise, Deer "Fourth of July 1804" Creek and the large mound or high point near the river yet stands proud, affording from its height a most exquisitely scenic landscape. The journals of Bourgmont, Lewis and Clark, and Sergeant Ordway are still extant. Upon this evidence, we rest our case.

Acknowledgments. First, we wish to thank landowners and tenants who granted access to their property. Our thanks to Bill Lees and John Reynolds for reading the first draft of this paper and offering valuable comments and

suggestions, which have been incorporated into the final draft. A special thanks to James L. Hansen, Reference Librarian, of the State Historical Society of Wisconsin, who provided without charge xerox copies of Sergeant John Ordway's journal entries for July 2-5, 1804.

REFERENCES

- Bakeless, John
1964 *The Journals of Lewis and Clark*. A Mentor Book. New American Library, Times Mirror, New York & Toronto.
- Dubois, Marquerite-Marie, et al.
1960 *Larousse's Dictionary, French-English, English-French*. Cardinal Edition. Pocket Book, Inc., New York.
- Hole, Frank, and Heizer, Robert F.
1973 *An Introduction to Prehistoric Archeology*. Holt, Rinehart and Winston, Inc., New York.
- Johnson, Alfred E.
1991 Kansa Origins: An Alternative. *Plains Anthropologist* 36(133):57-65.
- Margry, Pierre
1886 "Devcouvertes" *Sixieme Partie, Exploration Des Affluents Du Mississipi et Decouverte Des Montagnes Rocheuses (1679-1754)*. Paris.
- Moulton, Gary E. (Editor)
1987 *The Journals of Lewis & Clark Expedition August 30, 1803-August 24, 1804*. 3 vols. University of Nebraska Press, Lincoln.
- Norell, Frank
1988 *Bourgmont, Explorer of the Missouri 1698-1725*. University of Nebraska Press, Lincoln.
- Quaife, Milo M.
1916 *The Journals of Captain Meriweather Lewis and Sergeant John Ordway*. State Historical Society of Wisconsin, Madison.

Reichart, Milton

- 1977- On the Trail of Bourgmont. *Kansas*
1978 *Anthropological Association Newsletter*
23(4-5):1-79.

Rogers, Neil

- 1988 Emergency Archaeological Excavation
at 14DP2, The Doniphan Site. *The*
Missouri Archaeologist 49:57-65.
Missouri Archeological Society,
Columbia.

Thompson, Robert L.

- 1993 Rediscovered - The Grand Village Des
Canza? *The Kanza News. Newsletter of*
the Kanza Chapter of the K.A.A. 9(1):14-
18. Atchison, Kansas.

Thwaites, Reuben Gold

- 1904 *Original Journals of the Lewis and Clark*
Expedition 1804-1806. Dodd, Mead &
Company.

Wedel, Waldo R.

- 1959 *An Introduction to Kansas Archeology.*
Bulletin 174. Bureau of American
Ethnology, Smithsonian Institution,
Washington, D.C.

Witty, Thomas A.

- 1964 *Kansas Anthropological Association*
Newsletter 9(9):6-7.

**SHADOW GLEN
A LATE POMONA VARIANT OCCUPATION
IN THE LOWER KANSAS RIVER BASIN**

Brad Logan
University of Kansas

John G. Hedden
University of Iowa

The Kansas Anthropologist 14(2), 1993, pp. 10-30

Investigation of the Shadow Glen site (14JO21), Johnson County, Kansas, by the University of Kansas Museum of Anthropology and the Kansas Archaeological Field School in 1990 revealed evidence of a late Pomona variant occupation along Cedar Creek, a tributary of the lower Kansas River in northeastern Kansas. Data from the site, including features indicative of a pole-supported structure, an ash concentration, associated lithic and ceramic artifacts, floral and faunal remains and radiocarbon dates are described. Temporal, geographical, and formal information from Shadow Glen enhance our knowledge of this Plains Village complex and its relationship to other contemporaneous cultures in the Central Plains.

INTRODUCTION

The following report describes the results of an archeological investigation of the Shadow Glen site, which has yielded evidence of a Pomona variant occupation that adds to our knowledge of that complex in the lower Kansas River basin. Investigation of this site was part of the Plains Village Frontier Archeological Project, which was undertaken by the University of Kansas Museum of Anthropology (KUMA) in 1989-1990 with support from a matching grant-in-aid from the National Park Service, Department of the Interior. The grant was awarded and administered by the Historic Preservation Department, Kansas State Historical Society. The purpose of this project was twofold. It combined research concerning a specific problem about the prehistory of northeastern Kansas with cultural resources management goals outlined in the Topeka-Kansas City Corridor study (Adair et al. 1984).

Of primary concern from a research perspective was the need to explore selected sites in the lower Kansas River basin for their potential concerning the relationship of different

archeological complexes present in that area from ca. A.D. 900 to 1500. Specifically, previous research had demonstrated that contemporaneous archeological cultures, the Pomona variant, the Steed-Kisker phase, and at least one complex of the Central Plains Tradition (Nebraska), interacted in a frontier or shared resource area. These cultures are recognized by distinctive differences in their respective material culture attributes, principally ceramic variability, house form, and the location of such features as hearths and storage pits with respect to habitation structures, and in the geographic location of their core areas. The hypothetical Plains Village frontier, roughly circumscribed by the Delaware, Kansas, and Missouri rivers, includes all or parts of Atchison, Jefferson, Leavenworth, Wyandotte, Johnson, and Douglas counties, Kansas. Within this area several Plains Village sites are characterized by assemblages that contain artifacts indicative of more than one of the archeological complexes. Their association suggests contact and interaction of a nature as yet poorly understood. Surveys in Stranger Creek basin, the dominant drainage in the frontier, and smaller tributaries of the lower Kansas and Missouri rivers have

documented a number of these sites (Logan 1981, 1983, 1985, 1987). Working hypotheses about the nature of the relationship among Plains Village cultures in the frontier have been presented elsewhere (Logan 1988a). These hypotheses were tested as a result of the Kansas Archaeological Field School (KAFFS) excavations of the Zacharias site (14LV380) in 1988 and 1989. The Zacharias site, located in Salt Creek valley a few miles north of Leavenworth, Kansas, contained Steed-Kisker, Pomona, and Plains Woodland ceramics in direct association (Logan 1990). The Plains Village Frontier Project explored other sites in an attempt to test or refine these hypotheses.

Coincidentally, the Plains Village frontier corresponds to the Kansas City-Topeka Corridor, an area that was the focus of a cultural resources management plan developed by the University of Kansas for the Kansas Historic Preservation Office, Kansas State Historical Society (Figure 1). This area is experiencing rapid commercial, residential, industrial, and other forms of

development. Consequently, prehistoric and historic sites therein are threatened. A major concern of the project was to record the status of known and unknown resources in that area and document the impact of recent development on them. Initially, our focus in the Corridor was wide, and fieldwork was anticipated at selected sites in Stranger Creek basin and adjacent drainages that had been recorded as the result of previous projects for the Kansas Historic Preservation Office (e.g., Logan 1981, 1983, 1987). Our project, as originally envisioned, also called for survey along Cedar Creek, a south bank tributary of the Kansas River that drains terrain between Olathe and DeSoto in Johnson County. Parts of Cedar Creek had been designated in the Corridor study as one of the major conflict zones of the Kansas City Metropolitan Region (Adair et al. 1984:130-133). Our first reconnaissance of Cedar Creek valley verified this finding. We encountered a major development project in the area immediately south of K-10 Highway that was rich in archeological sites. Residential and recreational

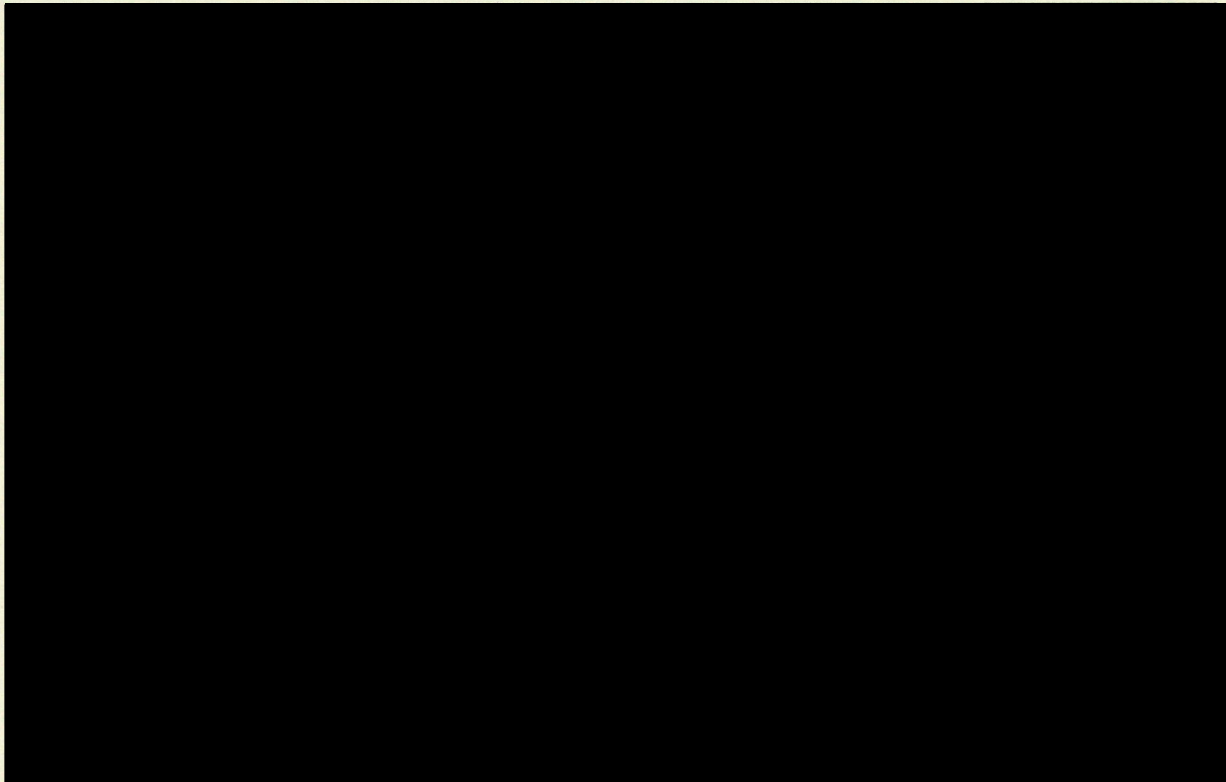


Figure 1. Location of sites discussed within the Topeka-Kansas City Corridor (adapted from Adair et al. 1984): 1) Zacharias site, 2) 14JO46, 3) Shadow Glen site, 4) 14JO521, 5) 14JO511.

construction related to this development, called Cedar Creek: The Community, will eventually impact at least 33 sites. Some of these sites had already been destroyed by such activity prior to our investigation (Logan 1990).

Intensive surface survey and test excavations were conducted at four sites in the Cedar Creek Community locality. These sites were selected because they contain Plains Village components and thus were relevant to our research problem. They were selected from 19 Plains Village components in that locality on the basis of information recovered during our initial surveys as sites more likely to yield data which could be compared or contrasted to those from the Zacharias site. These sites are 14JO521, 14JO511, 14JO46, and 14JO21. The results of our investigations at these sites can be found in the project report (Logan 1990). Herein we present the results of our investigation at 14JO21, Shadow Glen.

ENVIRONMENTAL SETTING

The Shadow Glen site is located [REDACTED] [REDACTED] (Figure 1). The site was originally recorded by the University of Kansas in 1968 as three areas designated A, B, and C. Area A is located on the T-1 terrace adjacent to the west bank of Cedar Creek at an elevation of 247-248 m (810-815 ft). Area B is on the present floodplain about 100 m east of Area A. Area C, which was also recorded by the Kansas State Historical Society as 14JO309, is located on the T-1 terrace about 75 m east of Area B. The soil type of all these areas is mapped as Reading silt loam (Plinsky et al.). All three areas appear to have single prehistoric components affiliated with the Pomona variant. Area A also has evidence of a Historic Euro-American occupation. An access road passes along the southern edge of Areas A and C. The site was cultivated at the time of its discovery in 1968 and was in wheat at the time of our investigation. The hillslope a few hundred meters south of the site area is wooded, and a narrow belt of trees skirts the stream to its north. Shadow Glen Golf Club, a part of the Cedar Creek Community development from

which the site takes its name, is located just opposite the stream from Area C.

Cedar Creek drains a portion of a physiographic unit within the Dissected Till Plain of northeastern Kansas called the Attenuated Drift Border (Schoewe 1949:289-291). This unit forms a 25-mile-wide belt along both sides of the lower Kansas River within which glacial deposits are more isolated than the rest of the Dissected Till Plains. Consequently, the topography is largely bedrock controlled and thus lacks the smoother appearance of terrain within the rest of that region. Bedrock exposures easily accessed by the prehistoric occupants of Cedar Creek valley for the raw materials essential for their stone age technology include at least three chert-bearing limestone members of Pennsylvanian age. Cherts of the Winterset limestone are light to dark gray and readily distinguished by the frequent appearance of veins of white calcite (Reid 1980). Plattsmouth cherts range from light to dark gray in color and contain abundant silicified fossils, especially fusulinids (Reid 1979). Toronto cherts range in color from white to pale brown and yellowish brown, are fine- to medium-grained, homogenous, and relatively fossil-free (O'Conner 1971; Logan 1988b).

Cedar Creek valley is located in a major ecotone characterized by a mosaic of its two dominant plant communities, tallgrass prairie and oak-hickory woodlands (Kuchler 1974). The native fauna of this ecotone reflected its varied habitats, grassland, woodland, and riverine. Of importance to its prehistoric hunter-gatherer inhabitants were such game animals as white-tail deer, wapiti, bison, raccoon, beaver, rabbit, squirrel, and turkey and other fowl, as well as a variety of aquatic animals such as fish and mollusks.

TEST EXCAVATIONS

Investigation of the Shadow Glen site entailed survey and test excavations by the University of Kansas Museum of Anthropology during the Plains Village Frontier Project and excavation of a 36-m² block and 2 x 1-m test unit by the Kansas Archaeological Field School

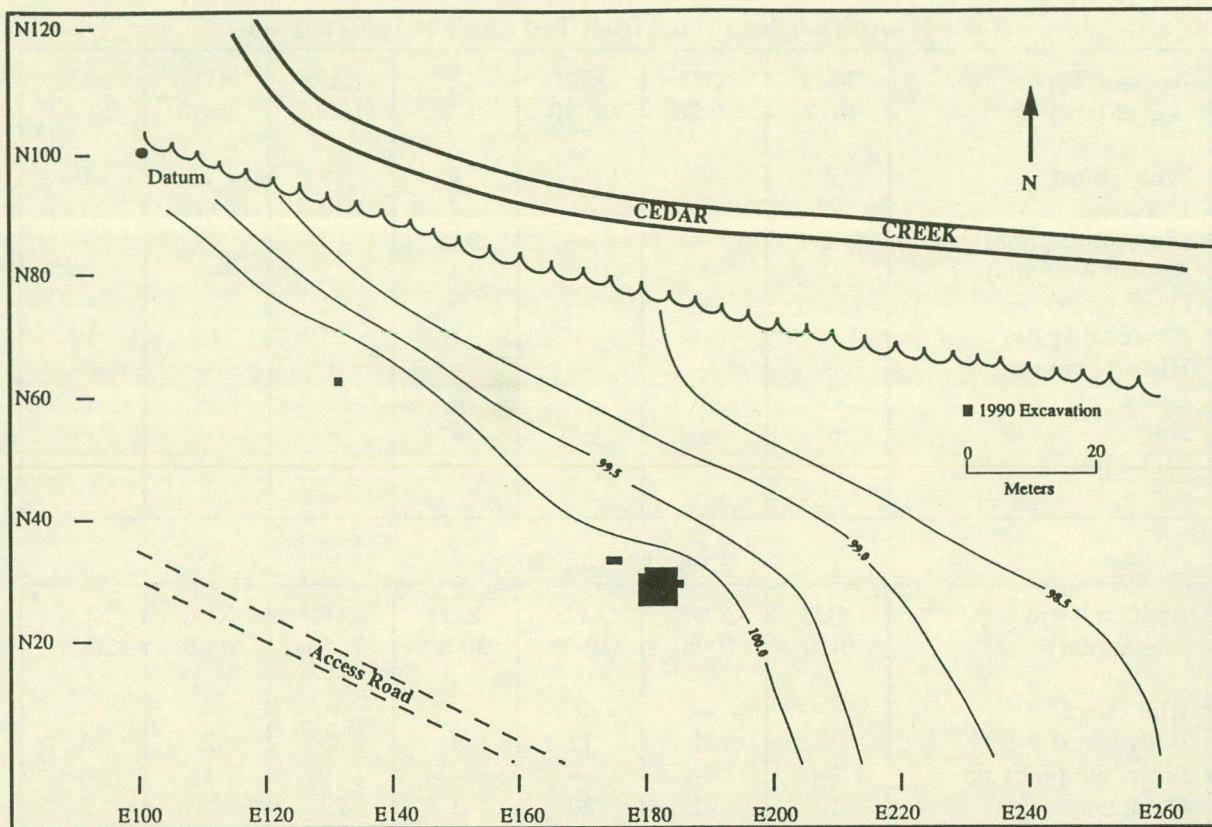


Figure 2. Map of 14JO21-A, showing location of excavated areas.

(Figure 2). When surveyed in the spring of 1990, Area A contained a moderate to heavy cultural material scatter consisting of ceramics, debitage, and groundstone. Area B contained dense crop scatter on the surface. Although no artifacts were observed from this area, the 1968 Kansas Archeological Survey Form indicates a heavy concentration near its northern end. Area C contained a moderate to light density scatter of modified flakes and debitage at the time of the KUMA survey.

Three test units were excavated in Area A, and one test unit was dug in Area C in April 1990. The locations of the test units in Area A were determined following a second surface survey and subsurface soil core extraction. Surface reconnaissance in Area A delimited an area of diffuse lithic debris on the knoll that forms the highest part of the eroded terrace tread. Test Unit 1 was dug in that area to a depth of 30 cm. Cultural material was limited to the shallow plowzone, which extended to about

the middle of the second level (i.e., a depth of ca. 15 cm). The lowest level of the unit was sterile.

Test Units 2 and 3 were excavated on a lower part of the T-1 terrace on the eastern edge of the site where probes with an Oakfield coring tool had detected pieces of charcoal and pottery below the plowzone. Material recovered from these units is listed in Table 1. The contrast in depth and relative integrity of the deposits in these units compared with those of Test Unit 1 in Area A and Test Unit 1 in Area C is apparent. In both units the quantity of prehistoric artifacts is comparable in Levels 2 and 3, the former transitional from plowzone to sub-plowzone and the latter entirely beyond the extent of agricultural disturbance. Artifacts were also recovered in the upper few centimeters of Level 4 in both of these units. Extensive rodent burrows were noted in both units, and two flakes were found within burrow fill at a depth of 38-39 cm in Test Unit 3. However, the depth of

Table 1. Artifacts Recovered from Test Units at 14J021-A and C.

Artifact Type Level (cm)	XU1 0-10	XU1 10-20	XU1 20-30	XU2 0-10	XU2 10-20	XU2 20-30	XU2 30-40
Body sherd	3	2	—	4	15	7	6
Debitage	25	8	—	7	12	14	3
Limestone (gms)	1	—	—	115	61	—	—
Sandstone (gms)	2	—	—	3	2	—	—
Daub (gms)	—	—	—	9	11	—	—
Charcoal (gms)	—	—	—	—	25	16	14
Historic ceramic	—	—	—	4	1	—	—
Glass	—	—	—	4	—	—	—
Nail	—	—	—	2	—	—	—
Metal nut	—	—	—	—	1	—	—

Table 1. (continued)

Artifact Type Level (cm)	XU3 0-10	XU3 10-20	XU3 20-30	XU3 30-40	XU1* 0-10	XU1 10-20	XU1 20-30
Rim sherd	—	—	2	—	—	—	—
Body sherd	9	11	11	1	1	2	1
Projectile point tip	—	—	—	—	—	1	—
Debitage	10	21	20	3	22	21	5
Limestone (gms)	38	10	—	—	—	14	—
Sandstone (gms)	1	2	4	—	—	—	—
Daub (gms)	4	2	—	—	1	—	—
Charcoal (gms)	—	—	7	10	—	—	—
Bone	—	—	—	1	—	—	—
Historic ceramic	6	2	—	—	—	—	—
Glass	2	1	—	—	—	—	—

* Test Unit in Area C

cultural material cannot be attributed entirely to downward transport through rodent activity as most of the artifacts noted in situ were not in burrows. A historic component is present in this area of 14J021-A. It is represented by ceramic, glass, and metal artifacts that were limited to the plowzone in both units. Several square nail fragments were recovered, and these suggest a late nineteenth- to early twentieth-century occupation. None of the ceramic sherds, all of which are rather small, bears any maker's marks or other temporally indicative attributes.

A single 1-m² test unit was excavated in an area of artifact concentration near the edge of

the terrace in Area C. This unit revealed stratigraphy comparable to that of Test Unit 1 in Area A. Nearly all the cultural material recovered from this unit was found in the plowzone, the upper 15 cm. The quantity of material dropped off sharply in its lowest level. The cultural materials from Test Unit 103 in Area A and Test Unit 1 in Area C and their vertical distribution are shown in Table 1.

No formal chipped stone tools were recovered from the test units in Area A, and only the tip of an arrow point was recovered from the lone test unit in Area C. The only artifact collected from the surface during this

phase of our investigation was part of a mano (Figure 3k), which has general surface provenience. Pottery sherds from the test units, including both rims from Test Unit 3 (Figures 4f and 5c), are typical Pomona ware. No mixture of Plains Village wares indicative of a "frontier relationship" was evident in the ceramic assemblage recovered during the testing phase. However, this aspect of the site was all the more interesting given its contrast with the "frontier" aspect of 14JO46, just 2 km (1.2 mi) north (Figure 1). Excavation of that site by the Iowa State University field school in 1972 had revealed artifacts indicative of both the Pomona variant and the Central Plains tradition (Nebraska phase?) (John Reynolds, personal communication, 1989; Logan and Hedden 1990). The site assemblage at that point in our investigation was considered more characteristic of what one would expect of a Pomona occupation in the core area of that complex. The depth, nature, and quantity of prehistoric artifacts in Test Units 2 and 3 indicated that portion of the site possessed some potential for increasing our knowledge of the Pomona variant in northeastern Kansas. Moreover, its contrasting nature vis-a-vis other sites in the Kansas City locality with evidence of more than one Plains Village complex, such as the Zacharias site and 14JO46, enhanced its research value for comparative purposes. For these reasons, the Shadow Glen site was selected for more intensive investigation by the 1990 Kansas Archaeological Field School, a research and educational program of the University of Kansas and Kansas State University.

KANSAS ARCHAEOLOGICAL FIELD SCHOOL INVESTIGATION

From June 4 to June 28, 1990, the KAFS conducted an intensive excavation at the Shadow Glen site in the area around Test Units 2 and 3. A block of 36 m² and an additional 2 x 1-meter test unit were dug in that area (Figure 2). All items larger than about 2 cm² were piece plotted and assigned field numbers that were later incorporated into their catalog numbers. The distribution of these artifacts is portrayed in Figure 6. Readers interested in the relative amounts of various artifact types recovered from the screened fill of these excavations are referred

to the Plains Village Frontier Project report (Logan 1990:Appendix 3). Again, historic debris was recovered from the upper levels of most of the units within the block excavation. Their general vertical distribution and confinement to the plowzone is indicated by their declining frequencies with depth. Level 1 (0-10 cm) yielded 191 historic artifacts; Level 2 (10-20 cm) contained 76 historic items; Level 3 (20-30 cm) had only six historic artifacts; and only a single historic artifact was recovered below 30 cm. Some observations about the Pomona variant component at the Shadow Glen site based on the KAFS-1990 investigation are presented below under appropriate headings.

Structure: Six post molds were recorded within the block excavation and their locations are depicted in Figure 6. In all cases they appeared against the yellowish brown B horizon as circular stains of dark grayish brown fill. Their dimensions and profile descriptions are provided in Table 2. Five of these features form a roughly square outline over an area of about 5.3 m. The sixth post mold, which was poorly defined, is disjunct to the northwest of the pattern by about 1.5 m. Another possible post mold was located in the northeastern corner of the block (Unit 31N/184E). Assigned a feature number after conclusion of the field work, this "mold" had the distinct circular outline and comparable diameter of the others and falls in line with the eastern row formed by three more classic post molds. Unfortunately, its cross section was too indistinct, and its inference as a post mold must remain conjectural. If Features 6 and 10 are included, the more trapezoidal area defined by the features covers about 11 m². At any rate, the number of post molds defined in the block excavation is too small to permit confident interpretation of the structure's form.

The post molds seem to reflect a rather insubstantial structure of pole framework with its long axis oriented northeast-southwest. A covering of wattle-and-daub is suggested by small quantities of daub in the artifact assemblage. However, this structure lacks the extensive mass of daub found at other Pomona sites, such as Hatcher (14DO19) (Johnson 1968) and Hart (14OS305) (Wilmeth 1970; Witty 1981). The structure at 14JO21-A is consistent with this

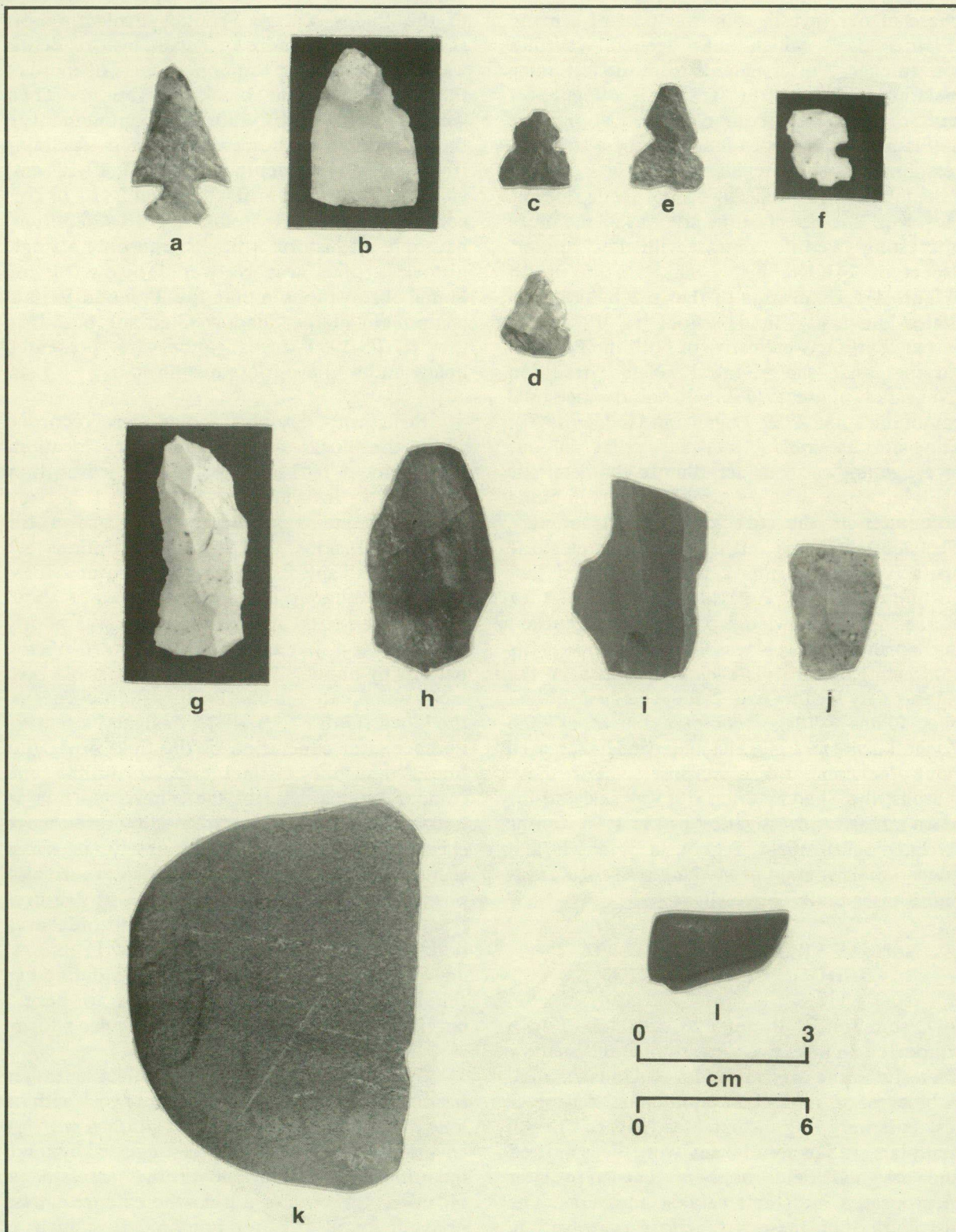


Figure 3. Lithic artifacts from Shadow Glen. a-f) arrowpoints, g-j) utilized blades and flakes, k) grinding stone, l) ground hematite.

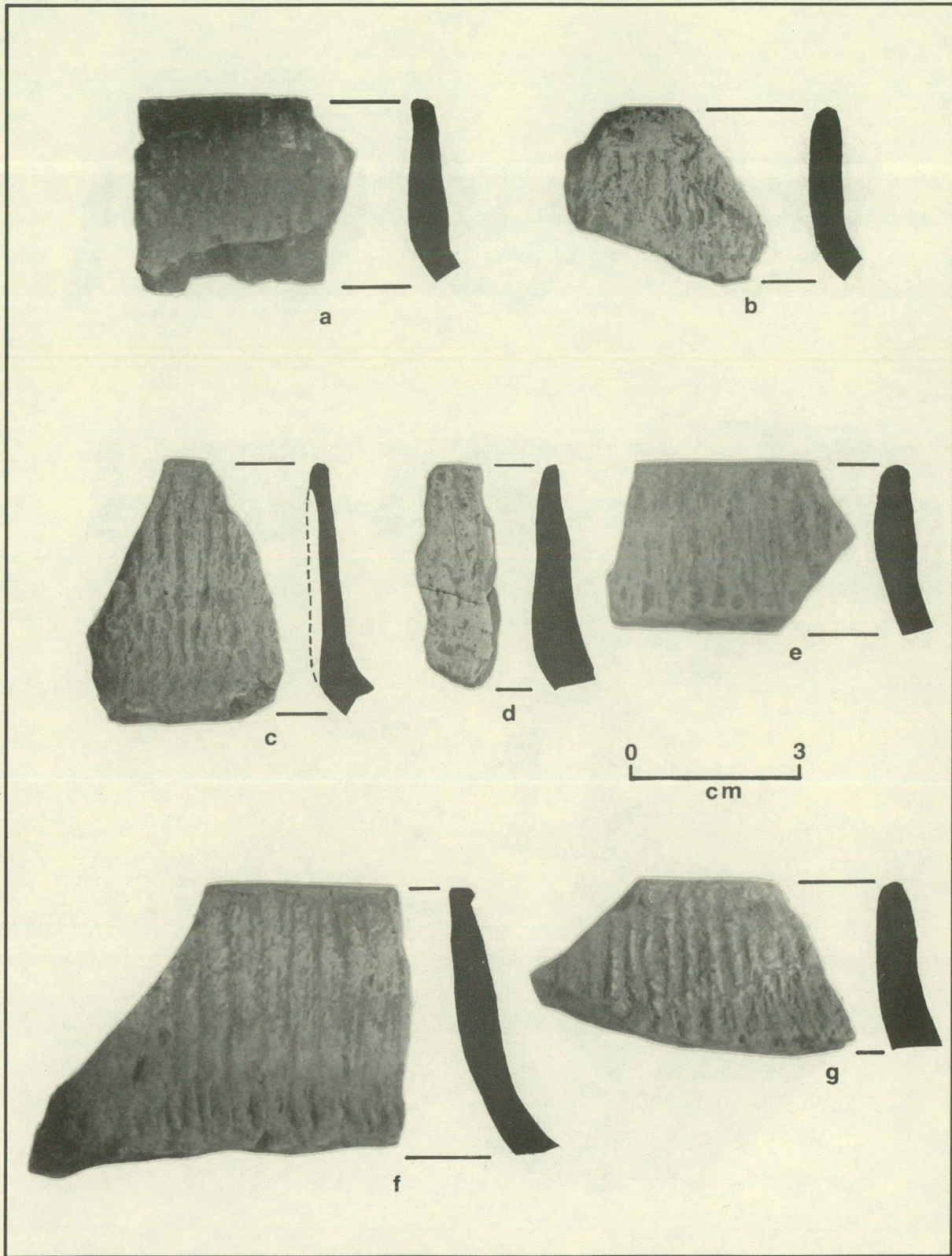


Figure 4. Rim sherds from Shadow Glen.

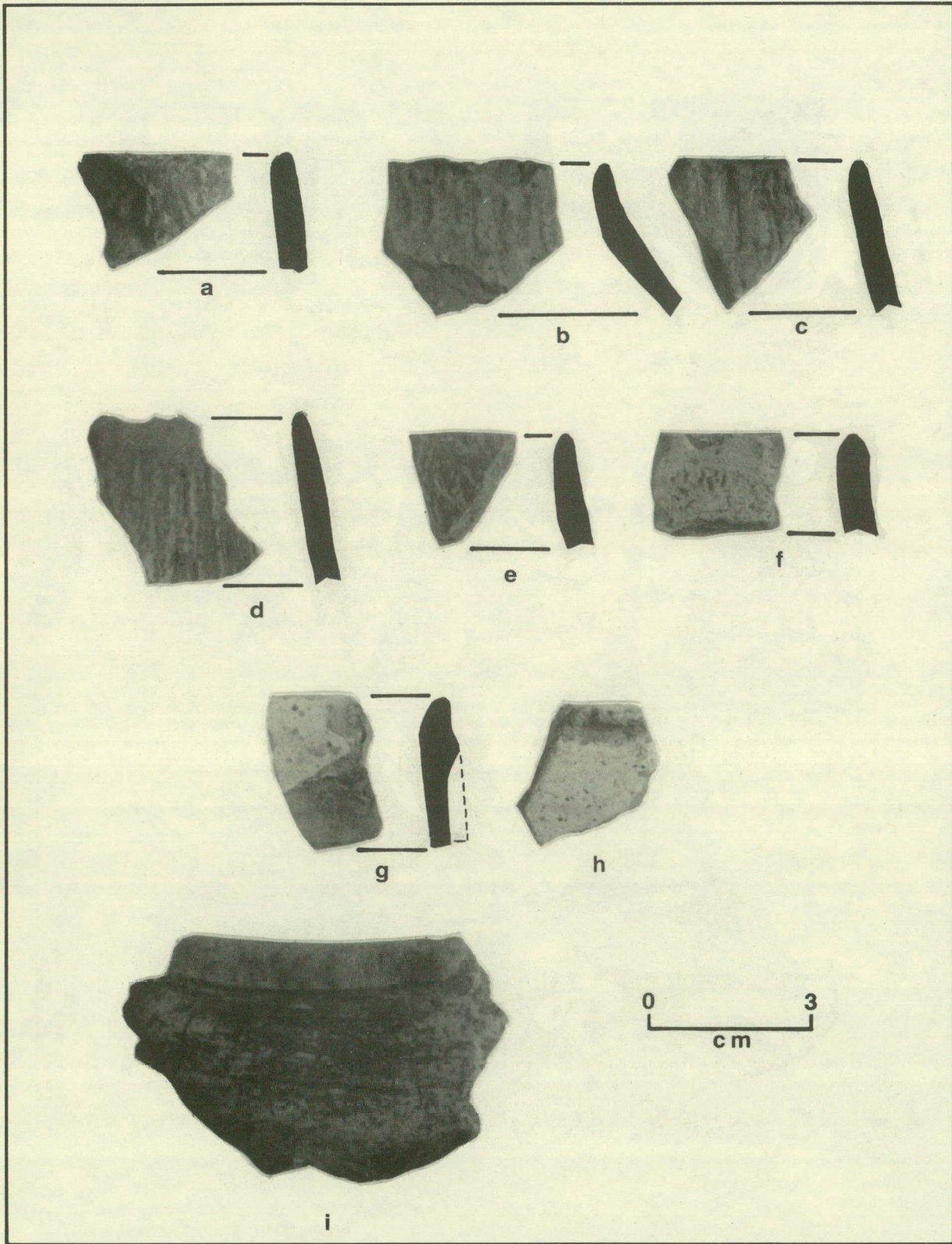


Figure 5. Rim (a-g) and shoulder (h-i) sherds from Shadow Glen.

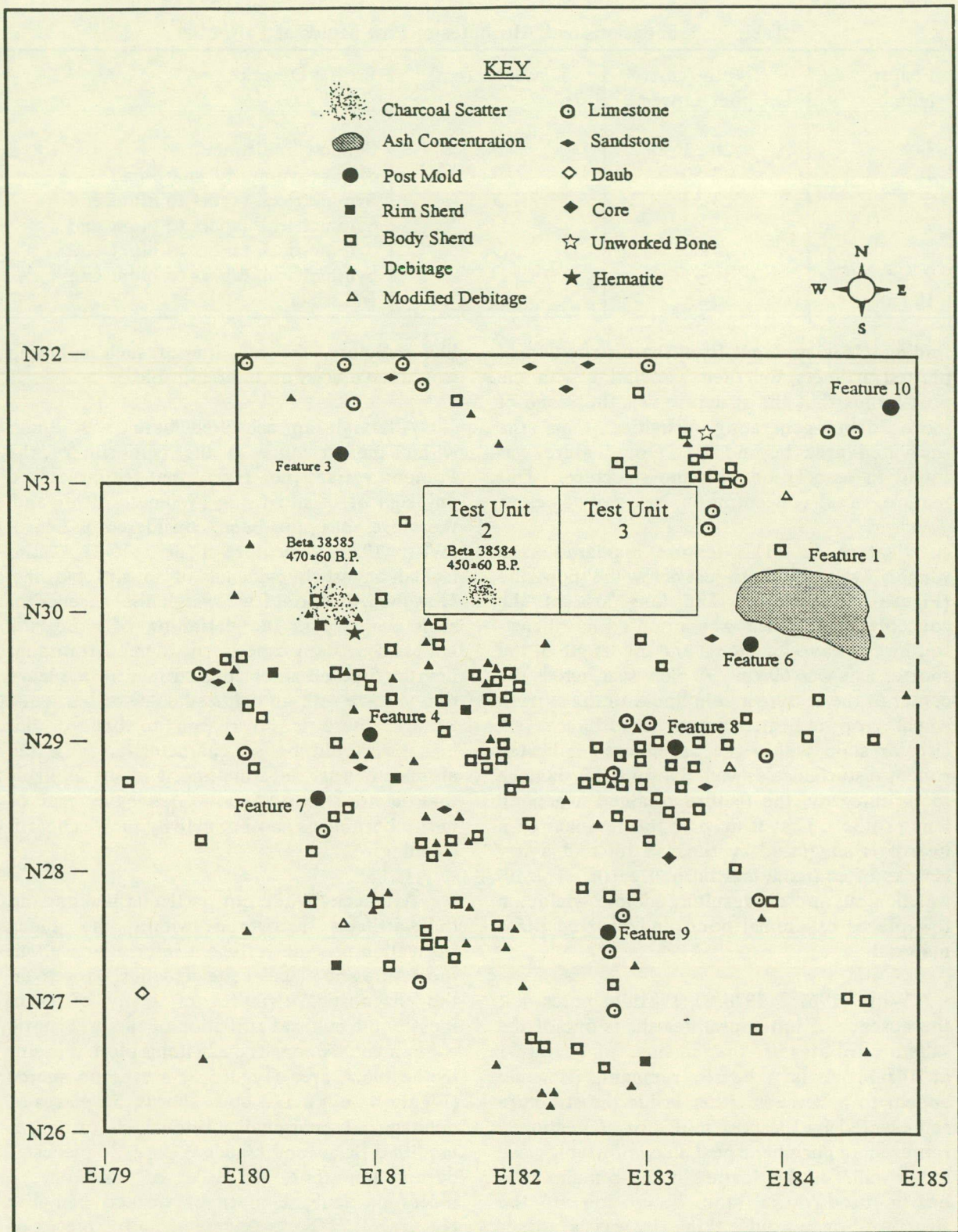


Figure 6. Plan view of the block excavation at 14JO21-A, showing the locations of piece-plotted artifacts, ash concentration, postmolds, and radiocarbon dated charcoal samples.

Table 2. Dimensions and Attributes of Post Molds at 14JO21-A.

Feature Number	Depth (cm) Upper-Lower	Diameter (cm)	Profile Description
3	28-31	8	Shallow, indistinct
4	33-50	9	Slight asymmetry, sharp end
6	23-33	9	Symmetrical, tapers to blunt end
7	35-42	11	Symmetrical, tapers to blunt end
8	25-30	9	Symmetrical, tapers to blunt end
9	30-41	11	Symmetrical, tapers to blunt end
10	30- ?	10	Indistinct

finding. It is apparent from the distribution of plotted artifacts and their association with the post molds that the structure was the scene of more debris-generating activities than the excavated area beyond it. One feature was found in association with the structure. This feature, an ash concentration, is described below.

Feature 1: This feature appeared as a roughly oval area of ash just below the plowzone (Figures 6 and 7). The long axis of the concentration, which was oriented northeast-southwest, was 94 cm long, and the length of the shorter axis was 60 cm. A plow scar across the center of the feature and in line with the current wheat crop indicated recent disturbance. A circular stain within the ashen area indicated rodent disturbance as well. Despite this damage to its integrity, the feature retained a general lens profile. That it may be the remnant of a hearth is suggested by the ash fill and a few chunks of charcoal and burned earth. The fill was floated, and the resulting samples yielded a few pieces of animal bone and charred plant material.

Witty (1967:2, 1978:60, 1981:78) notes that the absence of intramural hearths is one of the salient attributes of Pomona sites. If Feature 1 at 14JO21-A is a hearth remnant, it would appear to have been either inside the structure represented by the post molds or, if Feature 6 represents a peripheral post, uncomfortably close to its wall. If this feature is the remains of a hearth used during the occupation of the structure, one would think it was a rather dangerous place to put fire. On the other hand, if the structure lacked walls and the posts whose molds were discerned supported only a ramada-

like structure, the location of such a hearth would have been quite practicable.

Although an ash-filled basin was found within the structure at the type site of the Pomona variant (i.e., Hart), that feature lacked any sign of in situ firing (Wilmeth 1970) and, therefore, has not been considered a hearth (Witty 1981). Feature 1 at 14JO21-A also lacked any such evidence of in situ burning. How heavily should we weigh the absence of such evidence in the definition of a hearth? Unless consistent experiments demonstrate that hearths fired on an earthen surface always leave that surface with an oxidized color or hardened texture, there is no reason to believe that hearths should be so characterized. In the absence of such information, it is just as likely that the ash lens at Shadow Glen is the result of in situ burning as another activity such as hearth cleaning.

Artifacts: While not particularly abundant, the artifacts recovered within the block excavation provide sufficient information about the nature and place of site activities. Moreover, the diagnostic attributes of many of them identify the cultural affiliation of the prehistoric component. Among the 226 items plotted in situ in the block area (Figure 6) are 6 rim sherds (Figure 4a-e, g), 112 body sherds, 56 pieces of debitage, 4 marginally retouched or edge-modified flakes and blades, 1 core, 27 pieces of burned limestone, 15 pieces of sandstone, 2 pieces of daub, 1 piece of worked hematite (Figure 3l), 1 bone fragment, and 2 pieces of shale. The screened assemblage from the block (less T.U. 2 and 3) consists of 4,591 items of which 274 can be attributed to the historic



a



b

Figure 7. Ash concentration (Feature 1) a) before and b) after cross sectioning. Note disturbance by rodents and plowing.

component. These items are listed by category and quantity in Table 3. (Unit/level provenience of this material is provided in Logan 1990:Appendix 3.) Material from the KAFS test units, listed in Table 4, is sparse and indicates the area immediately northwest of the block, particularly below the plowzone, is relatively sterile.

Ceramics: The prehistoric pottery from the site is from one ware. All attributes of the sherds fall within the variability of those characteristic of Pomona ware (Witty 1967, 1978, 1981; Wilmeth 1970; Brown 1985). Rims are straight and relatively high with no apparent decoration, lips are rounded or flattened, and shoulders are flared (Figures 4 and 5). Two shoulder sherds, both with smoothed exterior surfaces, are sharply flaring (Figure 5h-i). Of the analyzable piece-plotted body sherds (n=99), the exterior surfaces of 64 are cordmarked, and those of 33 are smoothed. A single smoothed sherd bears a slip. When visible, temper is either crushed sherd or shell or a combination of both. That crushed shale may have been used as a tempering agent is suggested by the presence of pieces of this material in both the piece-plotted and screened samples. Exterior colors (Munsell) range from very dark gray (10YR3/1) or light brownish gray (10YR6/2) to light yellowish brown (10YR6/4), yellowish brown (10YR5/6-8), brownish yellow (10YR6/4), and very pale brown (10YR7/3-4). A few of the sherds have yellowish red (5YR5/6) exterior surface colors that may reflect oxidation of natural mineral inclusions in the paste. Core color is invariably a shade of gray, reflecting low firing temperatures. Thickness of the rim sherds (n=13, including both rims from the spring test units) ranges from 5 to 8 mm with a mean of 6.6 mm. Thickness of those piece-plotted body sherds on which this attribute is measurable (n=100) ranges from 3 to 10 mm with a mode (n=26) of 6 mm and a mean of 5.79 mm. Of the four sherds with a thickness of 9 mm, one is a shoulder fragment. The only sherd with a thickness of 10 mm is also a shoulder sherd (Figure 5i). Although vessel form is not adequately represented by the recovered sherds, all are compatible with the globular shape characteristic of Pomona ware. Mouth diameters, estimated from four rims, are 16 cm

(Figure 4a), 16-18 cm (Figure 4e), 24 cm (Figure 4g), and 24-28 cm (Figure 4f).

Although several of the smoothed, shell-tempered sherds are comparable in these respects to Platte Valley ware, no definite examples of that pottery occur in the assemblage. Such sherds fall within the range of variability of Pomona ware, particularly in northeastern Kansas (Brown 1985). The assemblage in all respects is in striking contrast to those recovered from 14JO46 and the Zacharias site (Logan 1990). Its monotypic nature reflects a "core area" occupation rather than a frontier occupation. In this respect, the site is an ideal case for discussion of Plains Village relationships in the project area.

Lithics: Very few formal chipped stone tools were found during our work at 14JO21-A. Only a small sample of arrowpoints was recovered, and all but one are from the plowzone within the block excavation. One of these (Figure 3a) bears attributes of the Scallorn type, generally considered diagnostic of the Plains Woodland period. However, such points occur in low frequency at Plains Village sites throughout northeastern Kansas (e.g., at the Zacharias site) and may indicate the gradual replacement of projectile point styles. The rest of the points from the site are typical Plains Village forms and include triangular unnotched (Figure 3b), side-notched (Figure 3c-d), and side- and basal-notched (Figure 3e-f) examples. Small end scrapers typical of the Plains Village period were not found during our work at the site. Indeed, utilized flakes or blades indicative of hide-scraping or woodworking tasks are rare in the assemblage. A few examples are shown in Figure 3g-j. Their scarcity may indicate that such activities were conducted more frequently beyond the structure.

Debitage consists of numerous tertiary flakes and chips of both local and exotic cherts. Though as yet unquantified, the relative frequency of these types may reflect a fairly high percentage of the latter. In particular, a fine-grained, homogenous white chert was noted with regularity in the assemblage. This material does not appear to be the white variety of Toronto chert and is considered to be Mississippian

Table 3. Screened Material from the Block Excavation at 14JO21-A.

	Item	Quantity	
Prehistoric	Rim sherds	10	(Figure 3a-f) (e.g., Figure 3g-j)
	Body sherds	1,397	
	Arrowpoints	6	
	Debitage	758	
	Marginally retouched/edge modified flakes	7	
	Abrader	1	
	Limestone	1,004	
	Sandstone	216	
	Daub	468	
	Burned earth	405	
	Ferrous oxide	22	
	Bone	10	
	Tooth fragment (deer?)	1	
	Charred nut shell	9	
	Charred corn kernel	2	
	Charred seed	1	
	Historic	Ceramic	
Glass		66	
Nail		28	
Metal		7	
Lead		2	
Bullet		1	
12 gauge shotgun shell base		1	

Table 4. Cultural Material from Units 33N/174E at 14JO21-A.

Unit	174E	174E	174E	175E	175E	175E
Depth (cm)	0-10	10-20	20-30	0-10	10-20	20-30
Arrowpoint	1	—	—	—	—	—
Body sherd	—	7	—	15	7	1
Debitage	3	2	2	7	3	—
Limestone	16	12	—	22	7	1
Sandstone	—	1	—	—	1	1
Daub	21	—	1	14	3	—
Burned earth	—	7	—	2	—	—
Ferrous oxide	—	1	—	—	—	—
Bone	—	—	1	—	—	—
Charcoal	—	+	+	—	—	—
Charred seed	—	—	—	—	1	—
Historic ceramic	2	7	—	2	2	—
Glass	—	1	—	3	—	—
Nail	2	—	—	1	—	—
Metal	—	7	—	—	—	—
Button	—	—	1	1	—	—

material from central Missouri. In fact, this chert occurs with surprising frequency at all of the sites tested in Cedar Creek valley. Chunks, shatter, and flakes of Winterset chert also occur in the assemblage, although this material is available in the lower Kansas River valley. Similar artifacts of Plattsmouth chert are also in the recovered sample.

Groundstone artifacts are very rare and consist of a mano of Sioux quartzite and a piece of worked hematite. Ferrous oxide, though present, is considerably more rare than at the Zacharias site. This may reflect the fact that this material, believed to be confined to glacial deposits north of the Kansas River valley, is not readily available. Alternatively, it may reflect less usage of this raw material for pigment production than is the case at Steed-Kisker sites. One abrader was found, and another piece of sandstone bears possible evidence of abrasion.

Limestone occurs far more frequently than sandstone as hearthstone debris. The lack of fire-cracked quartzite at Shadow Glen and other Cedar Creek sites investigated during the Plains Village Frontier Project probably reflects the fact that they are located beyond the Kansas Drift Border, where glacial till is considerably more abundant.

SUBSISTENCE

In order to recover as much evidence as possible about subsistence, flotation samples, consisting of a level half-bushel of fill, were taken in all sub-plowzone levels from the southwestern quadrant of each unit in the block and test excavations. As noted above, the fill from the ash concentration was also completely floated. A total of 44 bushels of earth from the site was processed during the field school. Although most of the fractions have yet to be sorted, cursory examination of the samples during the drying stage and sorting of selected fractions (including those from the hearth) revealed some subsistence data. A few fragments of plant material were also recovered through dry screening.

Among the charred plant remains from the site are at least three corn (*Zea mays*) kernels

and one cupule fragment (Mary J. Adair, personal communication). Though few in number, this material provides the first evidence of maize agriculture from a systematically sampled site of the Pomona variant. Though remains of corn have been recorded at other Pomona sites, these are even less abundant and poorly documented (Adair 1988:38). Too often Pomona sites fail to yield any remains of this domesticated plant (e.g., Blakeslee and Rohn 1986:1302). It is hoped that further analysis of the flotation samples will provide additional evidence of maize. The present sample is too small for us to speculate about whether the site occupants planted and harvested the corn in the site area or traded for it with other farming groups in the vicinity. Certainly the floodplain just east of the block excavation (i.e., Area B, where cultural material was reported in 1968) provided rich alluvium for a garden plot.

Other charred plant remains include fragments of black walnut (*Juglans nigra*) nutshells and either hickory or acorn nuts. A burned and fragmented hackberry (*Celtis occidentalis*) seed was recovered from the floated fill of the ash feature (Mary J. Adair, personal communication). These provide testimony to the gathering of wild plant foods. Both black walnut and hackberry could have been found among riparian trees along Cedar Creek in the immediate vicinity of the site.

Animal bone is very sparse in the biological assemblage. One fragment of bone from either a bird or a small mammal was found in the hearth. Other fragments from the block excavation, several charred, are unidentifiable and only attest to hunting activities. One small tooth fragment may be from a cervid molar (white-tailed deer?).

SETTLEMENT TYPE

The relatively sparse amount of cultural material and its lack of variety with respect to lithic tools, the apparent flimsy nature of the structure represented by the few post molds encountered, and the ambiguous nature of the ash feature (hearth?) all point to a short-term occupation of Area A at the Shadow Glen site. Pomona sites elsewhere, such as those in the

Hillsdale Lake area about 23 km (15 mi) south of Shadow Glen, exhibit some variety with respect to settlement type. Blakeslee and Rohn (1986:1285-1287) recognized seven categories of Pomona sites in the Hillsdale Lake area. These include extended communities, isolated habitations, small campsites, large camps, large linear limited function sites, small limited function sites, and butchering stations. Within this typology, Area A at the Shadow Glen site appears to be a small campsite. It is possible, given the proximity of Pomona materials at Areas B and C, that 14JO21 as a whole may be a large camp. However, more extensive excavations would be required in those areas in order to substantiate such an interpretation. Inevitably archeologists opting for that inference will face the problem of contemporaneity of the Pomona manifestations in each of these areas.

We now lack the data needed to infer season of occupation at Shadow Glen. As noted above, floral and faunal remains that might have permitted this analysis were too scanty. More extensive investigations of Pomona sites in the Cedar Creek locality are also required in order to put the Shadow Glen site in a broader, local context. Comparison of these sites and those along Bull Creek in the Hillside Lake area would be valuable for determining variability in Pomona settlement patterns.

RADIOCARBON DATES

Two samples of wood charcoal, both from the block area, were submitted for radiocarbon analysis to Beta Analytic, Inc. The provenience of these samples is shown in Figure 6. One consisted of three chunks of charcoal (9 g), and it yielded a date of 470 ± 60 B.P. or A.D. 1480 (Beta-38585). The other consisted of chunks (14 g) collected from the 20-30-cm level of T.U. 2, and it returned a date of 450 ± 60 B.P. or A.D. 1500 (Beta-38584). The means of both dates are quite close and, in conjunction with their close provenience, justify averaging. The average obtained is 460 ± 42.4 B.P., which calibrates to A.D. 1435 (515 B.P.) with a one sigma range of A.D. 1420-1445 (Stuiver and Becker 1986). This date falls within the accepted range of the Plains Village period in the Central Plains, though it extends the previously recognized temporal

range of the Pomona variant into the fifteenth century (cf., Brown 1985; Blakeslee and Rohn 1979:1290). A recent calibration of all known radiocarbon dates ($n=26$) from Pomona variant sites, exclusive of those from Gakushuin Laboratory (deemed unreliable), indicates that the dates from Shadow Glen are the youngest, most consistent assays currently available for this archeological culture (Logan and Ritterbush 1991).

TAXONOMIC AFFILIATION

Throughout this discussion the cultural affiliation of the Plains Village occupation of the Shadow Glen site has been referred to at the variant level. Although criteria for recognizing various phases of the Pomona variant have been established by Brown (1985), none of these is considered effective in identifying the Pomona occupants of the Shadow Glen site. Three of the taxa established by Brown could be candidates for the site on the basis of their geographic locations. These include the Clinton, Maybrook, and Apple Valley phases. We present here a brief summary of these phases and discuss their comparability to the Shadow Glen site.

Clinton Phase: Brown (1985:446) redefined this phase, originally proposed by Johnson (1968) from excavations in the Wakarusa River drainage, as characterized by arrowpoints made from non-local cherts and ceramic vessels with undecorated lips. The presence of shell temper in the ceramic ware was variable. Chronological placement is A.D. 960-1330. Sites of this phase are in Kansas drainages south of the Kansas River.

Maybrook Phase: Brown and Ziegler (1985) originally defined this phase from excavations in the Little Blue River drainage in Jackson County, Missouri. It has subsequently been refined on the basis of an investigation at one of the type sites by Schmits (1982) and by more comprehensive comparative research by Brown (1985:447). The latter summarizes the phase as follows: arrowpoints are made of non-local cherts, and ceramic vessels exhibit decorated lips (exclusive of knobbing) and frequent use of shell temper. Chronological placement is A.D. 1150-

1285. Sites of this phase are distributed through the Wakarusa, Neosho, Marais des Cygnes, and Verdigris river drainages in Kansas and the Little Blue and Truman reservoir localities of Missouri.

Apple Valley Phase: Brown (1985:447) introduced this taxon and distinguished it from others of the Pomona variant by the presence of knobs on the lips and rims of ceramic vessels. Other forms of lip decoration are known for this phase, and shell temper occurs consistently in the ceramic assemblages of Apple Valley sites. Arrowpoints made of non-local cherts rarely occur in the lithic assemblages. The chronological placement is A.D. 1300-1350. The geographic distribution of this phase includes the Delaware, Bull Creek, Verdigris, and Neosho river localities. The Delaware River drainage was suggested to have been its core area.

Unfortunately, the data from Shadow Glen are so variable as to render its assignment to any one of these taxa problematic. On the basis of the late radiocarbon dates from the site, Shadow Glen best fits the latest phase recognized by Brown, that is, Apple Valley. However, the pottery from Shadow Glen does not fit the distinctive ceramic attributes of the Apple Valley phase. The lack of decoration on Shadow Glen rim sherds suggests a Clinton phase affiliation. The rare presence of shell temper in the site's ceramic assemblage also suggests that the Clinton phase, rather than the Maybrook or Apple Valley phases, is the best candidate for its taxonomic placement according to Brown's criteria. However, Schmits (1982:16) notes that only 15 of the 84 sherds from the Maybrook site exhibited evidence of shell temper. Sherd temper was the primary additive in that assemblage, as it is at Shadow Glen.

Four of the seven arrowpoints from the site appear to be made of non-local cherts (two of Mississippian chert, one of Permian chert, and one of an as yet unidentified chert, possibly Permian) that reflect trade and/or movement to outcrops in the Flint Hills of northeastern Kansas and to central Missouri. Three points were made of the locally available Winterset chert. The relatively high frequency of non-local cherts for this artifact type would suggest that

the Apple Valley phase is a less likely candidate for the Shadow Glen occupants than the Clinton or Maybrook phases. However, the sample of arrowpoints is too small for confident interpretation of the site's taxonomic placement on that basis. Indeed, the taxonomic utility of arrowpoint raw material source is questionable given the as yet poorly defined variables that affected the acquisition of lithic raw materials by Pomona groups.

It is apparent that the data from Shadow Glen do not lend themselves well to confident taxonomic placement beyond the variant level. It is likely that investigation of more sites, such as those in Cedar Creek valley, will require future refinement or revision of the phases defined by Brown (1985) for this Plains Village culture.

SUMMARY

Despite thorough surveys of Area B at the Shadow Glen site, no cultural material was found there. Artifacts found in that area during previous surveys were few in number and may be attributable to activities ancillary to the occupancy of Area A. Testing of Area C at the site failed to reveal sub-plowzone deposits of sufficient integrity and quality for further investigation. Testing and subsequent intensive excavation of Area A revealed evidence of a Pomona variant occupation. Six or seven post molds that form a roughly rectangular outline reflect an insubstantial structure within and around which a variety of activities occurred. A concentration of ash and other hearth-like debris associated with the structure yielded evidence of subsistence practices, including utilization of wild plant and animal foods. A few burned corn kernels and a cupule fragment from fill within the structure provide some support for agriculture as one facet of Pomona economy.

Though meager, the evidence from Shadow Glen adds to our understanding of the Pomona culture. An important asset of the site was the relative integrity of its sub-plowzone deposits. Although the upper ca. 15 cm of the surface had been plowed and contaminated by a recent Historic occupation, the sub-plowzone deposits appeared to reflect a single short-term Pomona

occupation. No evidence of mixing with another prehistoric culture was found, a problem that plagued archeological interpretation of the numerous Pomona sites, for example, in the Hillsdale Lake area (Blakeslee and Rohn 1986:1272). The discrete nature of the prehistoric occupation is in striking contrast to the Plains Village components at frontier sites such as Zacharias and 14JO46. Despite recovery of a substantial sample of ceramic artifacts, only Pomona ware sherds were found. No Platte Valley ware, indicative of Steed-Kisker phase influence or contact, was recovered. No McVey, Beckman, or Swaboda wares, indicative of Nebraska phase influence or contact, were found. Neither was there any trace of Riley Cord-roughened pottery, which might have pointed to contact with the Smoky Hill culture to the west of the project area. Based on this assemblage alone, one could assume that at the time of the occupation of Shadow Glen, the Pomona folk had the lower Kansas River basin to themselves. The absence of any evidence of a frontier association of Plains Village cultures from 14JO21 enhances its comparative (rather, contrasting) value. It is an example of a classic, core-area site.

It is possible that the monotypic nature of the ceramic assemblage from this site is attributable to its apparent occupancy during the final century of the Plains Village period. Two radiocarbon dates with a calibrated average of A.D. 1435 (one sigma range=A.D. 1420-1445) indicate that the Pomona group occupied the site more than 100 years after the end of the Steed-Kisker phase and at least half that number of years following the Central Plains tradition in the lower Kansas and Missouri rivers (cf., Logan and Ritterbush 1991; Blakeslee and Caldwell 1979). Not only did the Pomona folk in northeastern Kansas survive all other Plains Village cultures in the Kansas City locality, so (from an archeological perspective) did their cultural heritage. Gone is any trace of influence from Central Plains tradition or Mississippian populations with respect to ceramic technology (with the exception of the minor use of shell temper) and house form as well. This has important implications for understanding frontier behavior based on archeological data. It suggests an indigenous group in the Central

Plains was open to contact and information exchange with different populations for a period of about 500 years (ca. A.D. 909-1400) yet maintained its cultural integrity throughout and beyond that period. It points to a significant degree of cultural conservatism.

Brown (1985:458) has noted that the descendants of the Pomona culture have yet to be identified but that "it is expected that they will most likely be found in the Kansas Till Plains of northeastern Kansas and southeastern Nebraska." This area was the domain of historic Siouan speaking groups, including the Kansa and the Oto. Recently, Johnson (1991) has suggested that the Kansa may have been the descendants of the Pomona variant. Given the conservative nature of the Pomona variant noted above, it is difficult at this time to accept an argument for Pomona ancestry to the historic Kansa. Despite the late date of 14JO21, it falls well within the Plains Village period and some 250 years shy of the inferred date of the tentatively identified Kansa occupancy of the Doniphan site (Wedel 1959). Pottery from the latter site is strikingly different from that of 14JO21. Doniphan site ceramics, attributed to the Kansa occupation, are Oneota-like, and the liberal use of trailed decorative motifs is in contrast to the persistent lack of such artistic expression among the Pomona. Comparable pottery from the King Hill site in St. Joseph, Missouri, and the Fanning site in southeastern Nebraska has also been attributed to Kansa occupations (Henning 1970; Raish 1979). The distinctive house pattern of the Historic Kansa is also considerably more elaborate than the consistently simple structures characteristic of the Pomona, particularly in comparison to that at the Shadow Glen site. It remains more prudent to postulate that the Kansa were an intrusive population than to infer that the Pomona experienced what for them would have been a radical culture change during the Protohistoric period. If the latter interpretation is valid, we should be able to identify not only transitional sites but the forces that brought about change that the preceding 500 years of contact with other Plains Village groups failed to accomplish. Such validation still requires investigation of other Pomona variant and Protohistoric sites in northeastern Kansas.

Acknowledgments. Investigation of the archeological resources of the Cedar Creek Community development area in general and the Shadow Glen site in particular would not have been possible without the consent and cooperation of Mr. Charlie Sunderland. The significant information we obtained during our work in that area would not have been acquired without his support. Mr. Dale Allen, Cedar Creek Community Project Biologist, handled the logistics of site access, provided background information about the site area, and obtained the consent of its farmer tenant for our excavations.

Michael Fosha and Byron Loosle, then M.A. and Ph.D. graduate students respectively at the University of Kansas, conducted the survey of Shadow Glen during the Plains Village Frontier Project and assisted the senior author during the test excavation. We are grateful to Patricia J. O'Brien, Kansas State University, for her contribution to the success of the 1990 session of the Kansas Archaeological Field School. John Hedden, then a M.A. graduate student at University of Kansas, served as research and teaching assistant during the field school investigation. Student participants during the KAFS-1990 were Eva Cook, Steve Duncan, Matt Eilert, Cindy Foor, Scott Hickman, Ivan Jones, Stephanie Odle, Jason Randall, Michelle Russell, Michael Strelow, and Catherine Wood. We are grateful to the field school students for their contribution to the successful recovery of data from Shadow Glen. We will always think of them and their toil in Cedar Creek valley on those summer days when "sometimes too hot the eye of heaven shines."

REFERENCES

- Adair, M. J., R. D. Mandel, P. Clement, and A. H. Simmons
1984 *Cultural Resources and Urban Development: The Kansas City-Topeka Corridor Project*. Project Report Series No. 55. 2 vols. Museum of Anthropology, University of Kansas, Lawrence.
- Adair, M. J.
1988 *Prehistoric Agriculture in the Central Plains*. Publications in Anthropology No. 16. Department of Anthropology, University of Kansas, Lawrence.
- Blakeslee, D. J., and W. W. Caldwell
1979 *The Nebraska Phase: An Appraisal*. J. and L. Reprint Co., Lincoln, Nebraska.
- Blakeslee, D. J., and A. H. Rohn
1986 *Man and Environment in Northeastern Kansas: The Hillsdale Lake Project*. 6 vols. Department of Anthropology, Wichita State University. Submitted to the Kansas City District, U.S. Army Corps of Engineers.
- Brown, K. L.
1985 *Pomona: A Plains Village Variant in Eastern Kansas and Western Missouri*. Unpublished Ph.D. dissertation, Department of Anthropology, University of Kansas, Lawrence.
- Brown, K. L., and R. J. Ziegler (assemblers)
1985 *Prehistoric Cultural Resources within the Right-of-Way of the Proposed Little Blue River Channel*. 2 vols. Museum of Anthropology, University of Kansas, Lawrence. Submitted to the Kansas City District, U.S. Army Corps of Engineers.
- Henning, D. R.
1970 Development and Interrelationships of Oneota Culture in the Lower Missouri River Valley. *Missouri Archaeologist* 32.
- Johnson, A. E.
1968 *Archaeological Investigations in the Clinton Reservoir Area, Eastern Kansas*. Museum of Anthropology, University of Kansas, Lawrence. Submitted to the Midwest Region, National Park Service, Department of the Interior.
- 1991 *Kansa Origins: An Alternative*. *Plains Anthropologist* 36(133):57-65.

- Kuchler, A. W.
1974 A new vegetation map of Kansas. *Ecology* 55:586-604.
- Logan, B.
1981 *An Archaeological Survey of the Stranger Creek Drainage System, Northeast Kansas*. Project Report Series No. 48. Museum of Anthropology, University of Kansas, Lawrence.
- 1983 *Archaeological Investigations in the Stranger Creek, Buck Creek, and Mud Creek Drainages, Northeast Kansas*. Project Report Series No. 53. Museum of Anthropology, University of Kansas, Lawrence.
- 1987 *An Archaeological Survey in the Vicinity of Bonner Springs and Edwardsville, Kansas*. Project Report Series No. 63. Museum of Anthropology, University of Kansas, Lawrence.
- 1988a The Plains Village Frontier in the Kansas City Locality. *Missouri Archaeologist* 49:3-25.
- 1988b Lithic Resources, Terrain Variation and Prehistoric Site Distribution in the Kansas City Locality. *Plains Anthropologist* 33:321-336.
- 1990 *Archaeological Investigations in the Plains Village Frontier, Northeastern Kansas*. Project Report Series No. 70. Museum of Anthropology, University of Kansas, Lawrence.
- Logan, B. and J. G. Hedden
1990 14JO46. In *Archaeological Investigations in the Plains Village Frontier, Northeastern Kansas*, edited by B. Logan, pp. 92-110. Project Report Series No. 70. Museum of Anthropology, University of Kansas, Lawrence.
- Logan, B. and L. W. Ritterbush
1991 Plains Village Cultural Interaction in the Lower Kansas River Basin. Paper presented at Kansas River Valley Symposium, 49th Plains Anthropological Conference, Lawrence, Kansas.
- O'Conner, H. G.
1971 *Geology and Ground-water Resources of Johnson County, Kansas*. Bulletin 203. Kansas Geological Survey, University of Kansas, Lawrence.
- Plinsky, R. O., J. L. Zimmerman, H. P. Dickey, G. N. Jorgensen, Jr., R. W. Fenwick, and W. E. Roth
1979 *Soil Survey of Johnson County, Kansas*. Soil Conservation Service, U.S. Department of Agriculture.
- Raish, C. B.
1979 *King Hill (23BN1), Fanning (14DP1) and Leary (25RH1): A Study of Oneota Variability*. Unpublished M.A. thesis, Department of Anthropology, University of Nebraska, Lincoln.
- Reid, K. C.
1979 Appendix 2: Stone Tool Assemblages. In *A Reconnaissance Survey of Prehistoric Resources in the Nodaway Basin, Southwestern Iowa*. Submitted to Iowa Division of Historic Preservation, Iowa City.
- 1980 Upper Pennsylvanian Cherts of the Forest City Basin: Missourian Stage. *Plains Anthropologist* 25(88):121-134.
- Schmits, L. J.
1982 The May Brook Site, Jackson County, Missouri. *Missouri Archaeologist* 43:1-66.
- Schoewe, W. H.
1949 The Geography of Kansas: Part II, Physical Geography. *Transactions of the Kansas Academy of Science* 52(3):261-333.
- Stuiver, M., and B. Becker
1986 A Decadal High-Precision Calibration Curve. *Radiocarbon* 28(2B):863-910.

- Wedel, W. R.
1959 *An Introduction to Kansas Archeology.*
Bulletin 174. Bureau of American
Ethnology, Smithsonian Institution,
Washington, D.C.
- Wilmeth, R.
1970 *Excavations in the Pomona Reservoir.*
Anthropological Series No. 5.
Archeology Department, Kansas State
Historical Society, Topeka.
- Witty, T. A., Jr.
1967 The Pomona Focus. *Kansas*
Anthropological Association Newsletter
12(9).
- 1978 *Along the Southern Edge: The*
Central Plains Tradition in Kansas. In
The Central Plains Tradition: Internal
Development and External
Relationships, edited by D. J.
Blakeslee, pp. 56-66. Report No. 11.
Office of the State Archeologist,
University of Iowa, Iowa City.
- 1981 *The Pomona Focus: Known and*
Unknown. Missouri Archaeologist
42:77-84.

ARCHEOLOGICAL INVESTIGATIONS AT 14DO317, SOUTH LAWRENCE TRAFFICWAY, DOUGLAS COUNTY, KANSAS

Timothy Weston
Kansas State Historical Society

The Kansas Anthropologist 14(2), 1993, pp. 31-50

Survey and test excavations were conducted by the Kansas State Historical Society at 14DO317 as part of planning for the South Lawrence Trafficway in Douglas County, Kansas. Over 200 artifacts, including 27 tools, were located on the surface. Four 1 x 1-m excavation units were placed in the site area with reference to areas of high surface artifact density. Excavation revealed that in all cases the cultural materials were confined to the plow zone. Surface and excavated materials revealed the presence of two occupations, Early Archaic Dalton and Late Prehistoric/Protohistoric.

INTRODUCTION

Archeological investigations were undertaken at 14DO317 as a result of planning for the South Lawrence Trafficway. This project will provide a bypass around the south and west sides of Lawrence, connecting Highway K-10 and the Kansas Turnpike. Archeological investigations in advance of such road construction projects are conducted by the Kansas State Historical Society under the terms of a cooperative agreement with the Kansas Department of Transportation (KDOT).

The site is located [REDACTED] and was discovered during a surface survey of the project study corridor (Lees 1986). At that time, 14DO317 was recorded as a small lithic scatter of indeterminate cultural affiliation. However, its location immediately adjacent to the Wakarusa River floodplain suggested that additional cultural materials and possibly intact sub-plow zone deposits might be present. Accordingly, test excavations were recommended once final alignments became available and it was clear that the site would be destroyed by road construction.

ENVIRONMENTAL SETTING

In physiographic terms, the project area 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 are a formerly glaciated northerly extension of the Osage Plains, which cover the rest of eastern Kansas. The slightly glaciated Attenuated Drift Border lies along the southern and western peripheries of the Dissected Till Plains in a 40- to 56-km (25- to 35-mile) wide strip, roughly marked by the Kansas, Big Blue, and Little Blue rivers. Bedrock in the eastern part of the Dissected Till Plains is Pennsylvanian in age. The formations are made up of interstratified beds of limestone, shale, and sandstone, covered 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 30.5 m (100 ft) on the bluffs along the Missouri River.

Judging from soil survey data and early historical accounts, the prehistoric vegetation of northeast Kansas consisted almost entirely of prairie, cut through by narrow ribbons of riverine forest. From east to west, forested conditions along the bluffs of the Missouri River gave way to a forest/prairie transition, which was marked by a "mosaic" situation. Forests with islands of prairie gradually changed into prairie with islands of forest and finally into prairie with little or no upland forest vegetation (Kuchler 1974:488). According to Kuchler (1974), the potential natural vegetation of most of the area

is tall grass prairie, consisting of dense stands of tall and medium tall graminoids, mainly big bluestem and little bluestem.

In the immediate site area, the native vegetation was generally tall grass prairie on level areas with an oak-hickory forest, associated with a prairie grass understory, on some sloping areas. Soils are dominated by the Gymer Series, which consists of deep, well drained, gently sloping soils in upland areas (Dickey et al. 1977:9).

The natural ecology of the region has been greatly altered by modern land-use practices. Today, most of the lands within Douglas County and the rest of the Attenuated Drift Border region are used for agricultural purposes, primarily the pasturing of cattle and the cultivation of crops such as wheat, corn, milo, and soybeans. Within the project area itself, land use is primarily agricultural, although residential and commercial development along the south and west sides of the city of Lawrence is rapidly changing the area's characteristics.

The South Lawrence Trafficway corridor lies within the Kansas and Wakarusa drainages near the confluence of these streams (Figure 1). As such, the project is located within the greater Kansas River watershed. Approximately 4 km (2.5 mi) of the project corridor are located within the Kansas River drainage, with the balance located within the drainage of the Wakarusa River. About 14 km (8.5 mi) of the 22-km (14-mi) corridor are located in the Wakarusa valley. Within the valley, the corridor crosses the gradual slopes and terraces that line the valley wall and crosses the flat, wide floodplain of the river. Within the floodplain, the corridor twice crosses Yankee Tank Creek, a tributary of the Wakarusa. Site 14DO317 is located south of Lawrence at the edge of a terrace, overlooking the Wakarusa valley near its confluence with Yankee Tank Creek.

CULTURAL SETTING

Considerable archeological attention has been afforded Douglas County, predominately associated with the planning and construction of



Figure 1. Excavations in progress at 14DO317. Wakarusa River floodplain is in background.

Clinton Dam, which is located on the Wakarusa River immediately upstream from the project area. The earliest large-scale archeological survey work conducted in the Clinton Reservoir area was a survey in 1965, which identified 66 archeological sites (Chism 1966). Later field investigations focused on excavations at 11 sites (Johnson 1968). These projects, along with those that followed (Chambers and Tompkins 1977; LeeDecker 1980; Logan 1987), established the presence of considerable prehistoric and historic occupation in the Clinton Reservoir area and, by extension, in the rest of Douglas County.

A total of 172 prehistoric and historic archeological sites have been recorded in the county, most as a result of the Clinton Reservoir research. These sites range in age from possible Paleoindian projectile point find spots to Historic Indian and Euro-American sites that date to the nineteenth century. The information that these sites have yielded has increased our understanding of past lifeways in the Dissected Till Plains physiographic region of northeast Kansas. The following summary is derived from Mandel et al. (1991:55-71) and from Lees (1986). Only those cultural complexes relevant to the South Lawrence Trafficway study area will be discussed here.

PALEOINDIAN PERIOD

The earliest known inhabitants of the Plains, and the ones for whom we have the least information, are referred to as the Paleoindians (Roberts 1940). While the beginning date of the Paleoindian period is a matter of hot debate in archeological circles (e.g., Fladmark 1986), the terminal date for the period, approximately 10,000 years ago, is correlated with dated extinctions of Pleistocene megafauna, particularly mammoth and extinct forms of bison (Grayson 1987). Most of the known Paleoindian sites in the Plains are kill or butchering sites, where the remains of mammoth, extinct bison, and other megafauna have been found in association with stone tools and evidence of butchering.

Paleoindian occupation of Kansas is confirmed by the presence of finely made projectile points, such as Clovis, Folsom,

Plainview, and Scottsbluff. No significant Paleoindian sites have yet been identified in the Dissected Till Plains, although isolated surface finds of points associated with the period are widespread. In particular, Reichart (1972, 1973, 1981, 1985) has contributed some tantalizing clues in the form of surface and gravel bar finds of the distinctive projectile points.

ARCHAIC PERIOD

Climatic fluctuations, associated with the terminal Pleistocene, are thought to have brought about major changes and influenced the development of the next distinctive pre-ceramic cultural period. The Archaic began around 8000 B.C. in some areas of the Plains and continued, at least in Kansas, until the beginning of the Christian era. The extinction of Pleistocene megafauna correlated with the onset of a dry, warm regime, a climate somewhat hotter and more arid than that experienced today (King 1980).

The Archaic period is marked by a seasonally shifting subsistence-settlement system, more regionally oriented and less nomadic than the Paleoindian pattern. Archaic hunters utilized modern fauna, such as bison, elk, and deer, and may have relied increasingly on wild plant foods as well. The generalized Archaic artifact inventory differs from that of the Paleoindian and includes such items as grinding slabs, ground stone axes, celts, gouges, and beads. Chipped stone axes, celts, knives, gouges, and other distinctive bifacially flaked objects were also made. Archaic projectile point forms are diversified and include unfluted lanceolate projectile points, as well as stemmed points in side-, corner-, or base-notched forms.

Early Archaic sites are relatively rare in northeast Kansas. Perhaps the best known is the Sutter site (14JN309), located in southeastern Jackson County (Katz 1971, 1973). Radiocarbon dates indicate an average range from 6118 to 5633 B.C. (Katz 1973:168), and diagnostic artifacts include lanceolate and parallel-sided, stemmed projectile points (Katz 1971:6-14).

The late Paleoindian/Early Archaic Dalton complex (8500-7000 B.C.) also deserves mention

here. It is best known from rockshelter excavations in northeastern Arkansas and adjacent portions of Missouri, although it has been detected as far north as Kansas City (Goodyear 1982). Dalton projectile points exhibit a deep basal notch and are quite distinctive. The complex is known in Kansas primarily from surface finds (O'Brien 1984:35-36).

The Middle Archaic is much better represented throughout eastern Kansas. In the study area, the Munkers Creek phase (3500-3000 B.C.) is best known. It was defined by Witty (1982) at the William Young site in Council Grove Lake. Munkers Creek components have been recognized at a number of eastern Kansas sites, including most notably the Cow Killer site in Melvern Lake (Reynolds 1984). The similar Black Vermillion phase of the glaciated region was defined by Schmits (1976, 1978, 1981) at the Coffey site in Tuttle Creek Lake. Diagnostic artifacts consist of very distinctive projectile point forms with long narrow lanceolate blades and straight-sided to slightly expanding stems, Clear Fork-like gouges, crudely flaked hourglass-shaped stone axes, and distinctive chipped stone knives that exhibit sickle polish (Thies 1990:14). Munkers Creek sites are perhaps best known for the unique ceramic effigies of human heads recovered at the William Young site (Witty 1982:124-126). Near the project area, Reichart (1984) has reported a Munkers Creek knife in the Delaware River valley northwest of Lawrence.

The Late Archaic period is well represented throughout eastern Kansas, but the culture most relevant to the study area is Nebo Hill (ca. 2000-1000 B.C.), situated primarily along the Missouri River (Shippee 1948; Reid 1983). Nebo Hill is characterized by very distinctive lanceolate projectile points and by the unique presence of fiber-tempered ceramics (Reid 1983:29-32). These ceramics are the earliest yet known on the Plains, and their occurrence in a securely established Late Archaic context has implications for investigation of supposedly preceramic sites throughout the region.

CERAMIC PERIODS

The Archaic period, as presently conceived, ended on the Plains around 2,000 years ago. The impetus for subsequent changes may have been a diffusion of new technologies, adaptations, and social systems from the eastern woodlands. A developing ceramic industry is the most obvious of the technological advances, and for this reason the post-Archaic cultural manifestations have been grouped together by Kansas archeologists as ceramic cultures (Champe 1946).

Another major technological change that occurred early in the Ceramic period is the acceptance of the bow and arrow, as indicated by small projectile points, which have been interpreted as arrowpoints. The Ceramic period is also apparently the time when cultigens were introduced into the Central Plains region, although these same cultigens may have originated in the eastern woodlands during the Archaic period.

Early Ceramic Period

In Kansas and northwestern Missouri, the beginning of the Early Ceramic period evidently involved the actual migration of people, as well as the diffusion of ideas, from the eastern woodlands. In the eastern United States, the Woodland period, which roughly equates with the Early Ceramic of the Central Plains, is divided into three sequential periods: Early, Middle, and Late Woodland. The earliest Woodland manifestations in Kansas, which appear to be similar to the Middle Woodland of the Lower Illinois valley, are represented by the distinctive Kansas City Hopewell complex. Kansas City Hopewell sites have been extensively investigated by Wedel (1959) and more recently by Johnson and others (Johnson 1974, 1976, 1979, 1981; Katz 1974). The suggested date range for Kansas City Hopewell components, based on a series of radiocarbon determinations from sites in northwestern Missouri and northeastern Kansas, is A.D. 1-500 (Johnson 1979:87). Although Kansas City Hopewell is

centered in the Kansas City area, village and burial mound sites attributable to this culture have also been found to the west, primarily along the Kansas River drainage. For example, the Ashland Bottom site, located near Manhattan, has been identified as Kansas City Hopewell on the basis of pottery and other artifacts (O'Brien 1979:18). Kansas City Hopewell materials have been reported to the south in the John Redmond Reservoir area. Here sherds with Hopewell characteristics were recovered at the Gilligan site (14CF332) (Jones and Witty 1980:67) and the Arrowhead Island site (14CF343) (Thies 1980:14).

The other main culture of the Early Ceramic period has been termed the Plains Woodland. The Grasshopper Falls phase is the most significant manifestation of this period in the project area. Grasshopper Falls phase site distribution is limited primarily to the Dissected Till Plains, although site components and diagnostic Grasshopper Falls ware sherds have been discovered to the south in the Osage Cuestas. The original definition of the Grasshopper Falls phase (Reynolds 1979, 1981) was based on excavated sites and surface collections from more than 100 sites in Jefferson, Jackson, and Atchison counties. Ceramics defined as Grasshopper Falls ware comprise the most significant diagnostic artifacts. Sherds, derived from simple utilitarian vessels, are coarsely tempered with angular grit particles and exhibit cord-roughened, smoothed, or brushed surfaces (Reynolds 1981:88). Other diagnostic artifacts include stemmed dart points and smaller side- and corner-notched projectile points.

Middle Ceramic Period

By about A.D. 800-1000 in at least some areas of Kansas, cultural groups were relying more heavily upon agriculture and living in even more stable and sedentary habitations than had the Early Ceramic period peoples. The Middle Ceramic period is sometimes referred to as the Plains Farmer period, due to the archeologically documented presence of domesticated plants, such as corn, beans, and squash, and tools associated with horticulture. The Middle

Ceramic in Kansas encompasses what is known elsewhere as Mississippian (O'Brien 1984:45, 57).

The cultural complex of this period most relevant to the South Lawrence Trafficway project area is the Pomona focus (Witty 1967, 1981, 1983; Wilmeth 1970). There is some dispute regarding the taxonomic placement of Pomona, since Brown (1985) has defined it as a variant with four recognized phases. More recently, Johnson (1991) has suggested that Pomona may be ancestral to the Kansa. Pomona sites (A.D. 1000-1600) are concentrated in the east-central portion of Kansas, primarily in the Osage Cuestas and the eastern Flint Hills, but they also occur in the Dissected Till Plains north of the Kansas River (Witty 1967:4, 1978:62). Diagnostic artifacts include small triangular side-notched forms along with significant numbers of larger, corner-notched and stemmed points.

The Clinton phase (ca. A.D. 1000-1500) was defined by Johnson (1968) on the basis of sites excavated in the Clinton Reservoir area and evidently is quite closely related to Pomona. The ceramic inventory consists of both globular vessels and shallow bowls with exterior surface finishes that range from cordmarked to smoothed. Tempering additives are typically clay or shale particles, although angular grit and shell temper also are noted in the sample. Chipped stone implements include plain triangular, side-notched triangular, and side- and base-notched triangular projectile point forms (Johnson 1968:134-135).

Late Ceramic Period

The Late Ceramic or protohistoric period represents the transition between the prehistoric and Historic periods. The dates fluctuate within local areas but generally fall within the range from A.D. 1500 to 1800. This is the first period during which recorded history can be used to identify archeological complexes with specific historic tribal groups. Witty (1980:11) notes that the Late Ceramic period, particularly in eastern Kansas, is marked by an increase in gardening efficiency and a significant increase in dependence on bison hunting, which allowed

populations to nucleate in large villages. Generalized artifact traits are globular pottery jars, sometimes with flattened bases and smooth or simple stamped exterior surfaces; small, plain, triangular projectile points; grooved mauls; bone and antler gardening and digging tools, hide fleshers, and scrapers.

Late Ceramic period cultures that could be encountered in northeast Kansas include late Oneota manifestations (protohistoric Siouans, perhaps Kansa) and Great Bend aspect (protohistoric and historic Wichita) (Wedel 1959:48, 60-61). The Wichita were one of the first agricultural groups of Plains Indians to be encountered by Europeans. In A.D. 1541, Coronado visited Wichita or "Quivira" Indian villages in central Kansas (Wedel 1959:60-61, 319-320). Great Bend aspect hunting camps in the Hillsdale Lake area of Miami County (Blakeslee and Rohn 1986) indicate that northeastern Kansas may have been partially within their large territory.

During the Late Ceramic period, at least some Siouan-speaking groups may have begun to make significant intrusions into Kansas. Sites attributed to the White Rock aspect, a protohistoric Oneota-like manifestation, have been discovered as far west as Mitchell and Jewell counties in north-central Kansas (Rusco 1960; Neuman 1963; Marshall 1969). Wedel (1959:634) has suggested that at least one Oneota site in Kansas, the Fanning site in Doniphan County, is an early historic site of the Kansa Indians.

HISTORIC INDIAN TRIBES

Kansa

Two Siouan-speaking tribes were closely associated with the area now called Kansas during historic, and possibly prehistoric, times. During at least portions of the Historic period, the Osage, inhabited southeast Kansas, outside of the present study area. The Kansa, however, lived in northeast Kansas from sometime during the 1700s up until the late 1840s. The history and archeology of the Kansa have been summarized by Unrau (1971) and Wedel (1946, 1959).

Immigrant Tribes

In 1825, the reservation era began in Kansas with the signing of treaties between the United States government and the Kansa and Osage tribes (Abel 1904:75-77). These treaties sharply restricted the territories of the two groups. The Kansa were confined to a 48-km- (30-mi-) wide reservation along the Kansas River, and the Osage were limited to a strip of land along the Neosho and Verdigris rivers in southeastern Kansas. Around 1846, the Kansa were moved to a still smaller reservation near Council Grove. In 1872 and 1873 both tribes finally were removed to Oklahoma.

With the placement of the Kansa and the Osage on diminished reservations in 1825, the United States government was free to establish reservations in Kansas for eastern tribes. The largest block of tribes resettled in Kansas came from the Great Lakes region of Illinois and Ohio. Predominantly Algonquian speakers, these groups included the Potawatomi, confederated Sac and Fox, Miami, Kickapoo, Ottawa, Chippewa, and Shawnee. Siouan speakers from Nebraska, Iowa, Missouri, and Arkansas comprised another large block of tribes, including the Oto, Missouri, Iowa, and Quapaw. The Delaware, originally from the northeastern United States, received a reservation in Kansas, as well as a narrow strip of land called the Delaware Outlet, which allowed access to the bison-rich High Plains to the west. A few New York tribes and the Cherokee from the southeastern United States were given small reservations. Today, the only remaining reservations (Kickapoo, Pottawatomie, and Iowa Sac and Fox) are all located north of the study area in the northeast portion of the state.

While it was the intent of the government to transform these people into peaceful farmers, practicing Euro-American techniques, it is evident from the documentary sources that at least some resisted these changes (Murphy 1961; Clifton 1977). The experience of the Kickapoo is fairly typical. Although they have retained a small portion of their original reservation lands in Kansas, the process of long-term forced

acculturation has led to problems that persist to this day (Stull 1984).

EURO-AMERICAN SETTLEMENT

The earliest known historical accounts dealing with Kansas are those of the Coronado expedition of A.D. 1541 (e.g., Hammond and Rey 1940). In the succeeding 150 years, a number of other Spanish exploratory expeditions from the American Southwest visited the Kansas region (Wedel 1959:19-26).

The French entered the area from the east by way of the Great Lakes and the Mississippi River valley. Early French documents are vague and generalized, which makes it uncertain just when the westward penetration began and how extensive it was (Wedel 1959:26). The expeditions of Claude Charles du Tisne to southeastern Kansas and northeastern Oklahoma in 1719 and of Etienne Veniard de Bourgmond in 1724 document the presence of the French in the region (W. Wedel 1959:28-33; M. Wedel 1981:25-26; Reichart 1979). Fort Cavagnial was established by the French along the Missouri River in Kansas in 1744 and was officially maintained until 1764 (Hoffhaus 1964).

Traders and missionaries accompanied the Kickapoo when they moved to the Kansas reservation in the 1830s. In the early 1850s, white settlers crossed over from Missouri into Kickapoo lands, anticipating the creation of Kansas territory (Stull 1984:76), which took place in 1854 with the passage of the Kansas-Nebraska Act. The nineteenth-century Euro-American settlement pattern of dispersed farmsteads and small to medium-sized farming communities was then established. The primary use of lands during the second half of the nineteenth century and the twentieth century has been farming, with the early small farms rapidly giving way to larger and more commercial operations.

Local Euro-American Settlement

The Douglas County area has a rich heritage during the Historic period. During the early part of the nineteenth century, the area was traversed by a number of important emigrant

trails, including the Oregon and California trails. This area was an important locus of settlement during the 1850s, with Lawrence itself being a very important center during this early period. Douglas County was established by the First Territorial Legislature at its session in 1855 (Andreas 1883:308). The county was very active during the Territorial period, and Lawrence is famous for Quantrill's Raid during the Civil War.

The speculative town of Franklin, first settled in about 1853, was located approximately 11 km (7 mi) southeast of Lawrence on a high point of land, formed by the confluence of the valleys of the Wakarusa and Kansas rivers. Franklin declined and was eventually abandoned following the Civil War. On the 1873 county plat, Franklin was shown to have only half a dozen buildings within the limits of the platted town, most located toward the eastern edge (Beers 1873). The South Lawrence Trafficway study corridor passes through the western part of the platted town of Franklin. Following the Civil War, the area around Lawrence and the former townsite of Franklin continued the agricultural existence that had characterized it from the start.

RESEARCH METHODS

Test investigations at 14DO317 initially focused on examination of the survey report, site form, other literature sources, and project engineering maps. These documents indicated that the site was recorded as a relatively sparse lithic scatter, located on a sloping terrace surface overlooking the Wakarusa River floodplain. However, surface visibility at the time of initial survey was not ideal, and it was believed that this might be a factor in the thin scatter of cultural materials observed. Accordingly, field investigations began with an intensive surface examination and progressed to test excavations.

SURFACE SURVEY

The first step in field investigation was to establish the location of the highway centerline across the site area. Although it was not staked, its location was easily set using tapes with reference to project engineering maps. A

mapping station was then established along the centerline, just east of the broad ridge that runs northeast-southwest through the site area (Figure 2).

The next step was to closely examine the surface for cultural materials to delineate any concentrations and recover temporally diagnostic artifacts. At the time of the testing project, in late November and early December of 1992, the corn crop in the site area had been harvested. However, an extended period of wet weather had made it impossible for the owner to disk the ground, so corn stubble was still standing. With the stubble and other crop debris on the ground, surface visibility was 60-70%. The crew systematically walked the site in approximate 2-m transects, marking all cultural materials with pin flags. When the process was complete, over 200 artifacts, primarily unmodified flakes, had been located. A concentration of artifacts was visible extending down the ridge through the site area. Density was highest to the north, decreasing to the south toward the Wakarusa floodplain. Within the overall distribution of artifacts, several areas of noticeably higher density were visible. These were chosen for placement of four 1 x 1-m excavation units (Figure 2).

Given time constraints, it was decided that not all of the 200+ surface artifacts could be shot in with transit and stadia from the mapping station. Therefore, pin flags marking all non-tools were removed, and only tools were shot in. A total of 27 tools were located in this manner and are plotted in Figure 2. Most are non-diagnostic scrapers, biface fragments, cores, and utilized flakes. There are, however, two temporally diagnostic projectile points and one faceted blue glass bead (Table 1).

The projectile points are associated with widely differing time periods. The first is the basal portion of an Early Archaic Dalton point (Figure 3a). The artifact possesses all of the morphological features of Dalton bases, including prominent projections or "ears" and basal grinding (Chapman 1948; Morse 1971; Goodyear 1974; Justice 1987:40-42). Interestingly, it may be made of chert from the Maple City quarry in southern Cowley County.

The Maple City chert quarries are a northern extension of the quarries in Kay County, Oklahoma, and were extensively mined by the prehistoric inhabitants of the Central Plains (Wedel 1959:476-480; Banks 1990:96-106).

The second projectile point is a small, unnotched triangular artifact (Figure 3b) made of Wreford chert from the Flint Hills (Banks 1990:133, 146). Such tools are diagnostic of the Late Prehistoric period and are ubiquitous across most of the eastern and central United States. In Kansas, such points are often referred to as "Fresno-like," for a widespread type first defined in Texas (Kelley 1947; Suhm et al. 1954:498; Bell 1960; O'Brien 1984:126; Justice 1987:230).

The faceted blue glass bead is small but quite distinctive (Figure 3d). This artifact is clearly of non-native manufacture. Close examination reveals that it is a drawn and faceted "Russian" bead, possibly made in Venice in the early nineteenth century (Dubin 1987:335,337). At 14SH322 in the proposed Grove Reservoir, a total of 22 faceted blue glass beads were recovered. All are two-layered with a light aqua core and a darker blue exterior. Such ornaments have been found at Wichita Indian sites, dating to the late eighteenth century (Reynolds 1987:115-117). Similar beads were found during excavations at Fort Scott in Bourbon County, which was occupied from 1842 to 1873 (Reynolds 1983:151-154, 369). The presence of such an artifact at 14DO317 clearly suggests a protohistoric occupation, during which the site's occupants had contact with Euro-American trade goods, if not Euro-Americans themselves.

A second very different bead was found later in level 2 of excavation unit 2 (X2). This artifact is made from a drilled section of crinoid fossil (Figure 3c). It represents a pre-contact ornament, made entirely from materials available prior to the introduction of trade goods. As such, it represents an interesting contrast with the post-contact glass bead.

Two other interesting artifacts were found during surface examination. They are both made from ground hematite, one a faceted

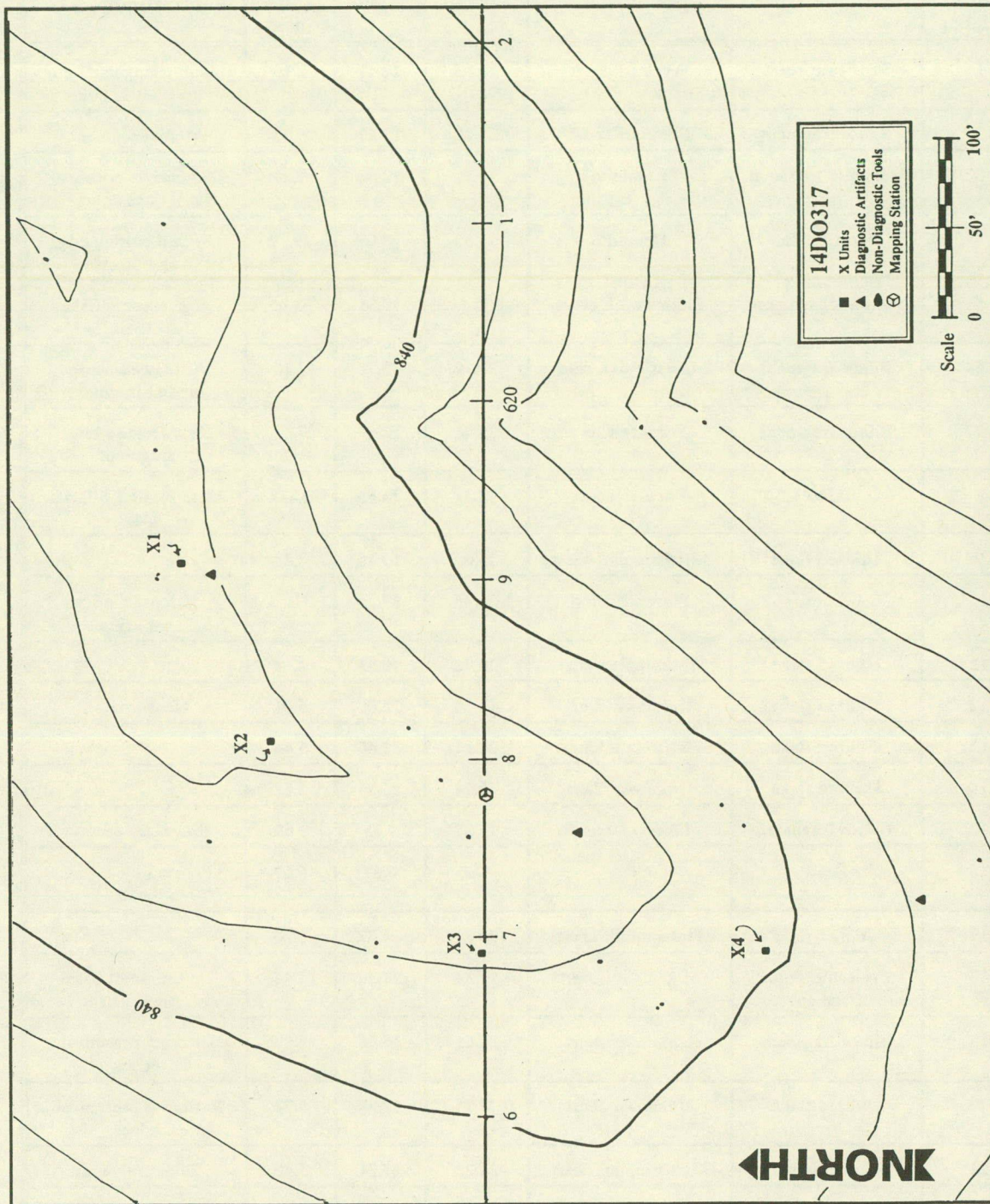


Figure 2. Distribution of surface artifacts and excavation units at 14DO317.

Table 1. Description of Point-Plotted and General Surface Artifacts from 14DO317.

Artifact Number	Artifact Type	Raw Material	Length	Width	Thick-ness	Notes
1	Projectile point	Wreford chert	14.83	12.47	2.16	Small triangular Late Prehistoric point
2	Biface fragment	Florence chert	21.21	23.43	4.03	Medial segment
3	Hematite fragment	Hematite	26.31	12.86	9.96	Numerous polished facets
4	Hematite celt	Hematite	94.53	78.08	29.77	Ground cutting edge and facets
5	Unifacial scraper	Plattsmouth chert	152.58	59.36	33.05	Large crudely flaked tool
6	Biface fragment	Mississippian chert	20.19	15.92	3.40	Thin, well-made medial fragment
7	Biface fragment	Foraker chert	25.41	12.69	7.81	Heat-treated edge fragment
8	Biface	Foraker chert	72.31	54.44	25.12	Heat-treated bifacial blank
9	Utilized flake	Mississippian chert	35.65	19.36	4.88	
10	Core	Florence chert	56.46	57.35	31.13	Extensive edge battering
11	Utilized flake	Mississippian chert	26.72	16.33	4.13	
12	Utilized flake	Unknown chert	19.54	22.06	5.01	Heat-treated
13	Utilized flake	Plattsmouth chert	24.95	21.46	5.64	
14	Utilized flake	Unknown chert	25.74	26.84	5.68	
15	Biface fragment	Florence chert	17.27	9.75	3.59	Biface tip present
16	Bead	Glass	5.80	6.67	6.67	Faceted blue glass bead
17	Utilized flake	Plattsmouth chert	24.31	24.87	6.20	
18	Projectile point fragment	Maple City chert	15.54	23.30	5.44	Dalton point basal fragment
19	Biface fragment	Unknown chert	29.81	16.56	5.99	Battering present on edges
20	Utilized flake	Unknown chert	27.75	12.58	6.72	Battering present on edges
21	Biface fragment	Mississippian chert	21.20	17.21	5.45	Edge fragment
22	Utilized flake	Unknown chert	12.89	11.85	3.50	
23	Split cobble	Unknown chert	18.43	22.04	7.35	Some battering present on cortex

24	Utilized flake	Plattsmouth chert	19.37	14.41	4.00	
25	Utilized flake	Unknown chert	17.19	17.20	4.25	
26	Utilized flake	Permian chert	22.46	13.78	3.36	
27	Hammerstone	Quartzite	87.15	77.71	47.90	Distinct battering on one end
General surface	Utilized flake	Florence chert	26.99	28.36	5.34	
General surface	Utilized flake	Mississippian chert	30.57	21.65	6.61	
General surface	Unmodified flake	Mississippian chert	21.61	25.96	11.06	
General surface	Unmodified flake	Mississippian chert	11.64	11.44	3.33	
General surface	Unmodified flake	Permian chert	18.22	8.39	2.69	
General surface	Unmodified flake	Permian chert	9.21	6.69	1.95	
General surface	Biface fragment	Unknown chert	14.24	23.06	6.23	Basal segment
General Surface	Sherd	Ceramic	23.48	18.99	4.87	Smooth body sherd, no visible temper
General surface	Sherd	Ceramic	19.38	14.61	2.78	Smooth body sherd, no visible temper

fragment (Figure 3e) and the other a celt or axe (Figure 3f). The smaller artifact likely was employed as a pigment source, while the celt may have been used for chopping, as well as for pigment. Hematite artifacts are not temporally diagnostic, and research in the Missouri Ozarks suggests that they are present throughout most of the prehistoric sequence (Roper and Van Ness 1981:127).

After completion of surface survey, it was clear that the site contained a much more dense scatter of artifacts than had been visible during initial survey in 1986. Diagnostic artifacts suggested the presence of Early Archaic and Late Prehistoric/Protohistoric components. Other lines of evidence, such as prehistoric ceramics on the surface of adjacent fields, suggested that most of the occupation was relatively late.

TEST EXCAVATIONS

Test excavations were undertaken in order to determine the nature and extent of any in-situ subsurface deposits. The site area has probably been cultivated since late in the last century and has surely been subjected to considerable erosion. Under such circumstances, sub-plow zone cultural deposits often do not survive. A total of four excavation units (X1-X4) were placed in the site area with reference to the distribution of surface artifacts. The stratigraphy in these units was quite similar and can be compared in Figure 4. Cultural materials recovered from each unit have been tabulated by 10-cm level in Table 2.

All four excavation units exhibited a simple stratigraphic pattern of plow zone over sterile subsoil (Figure 4). The plow zone consisted of

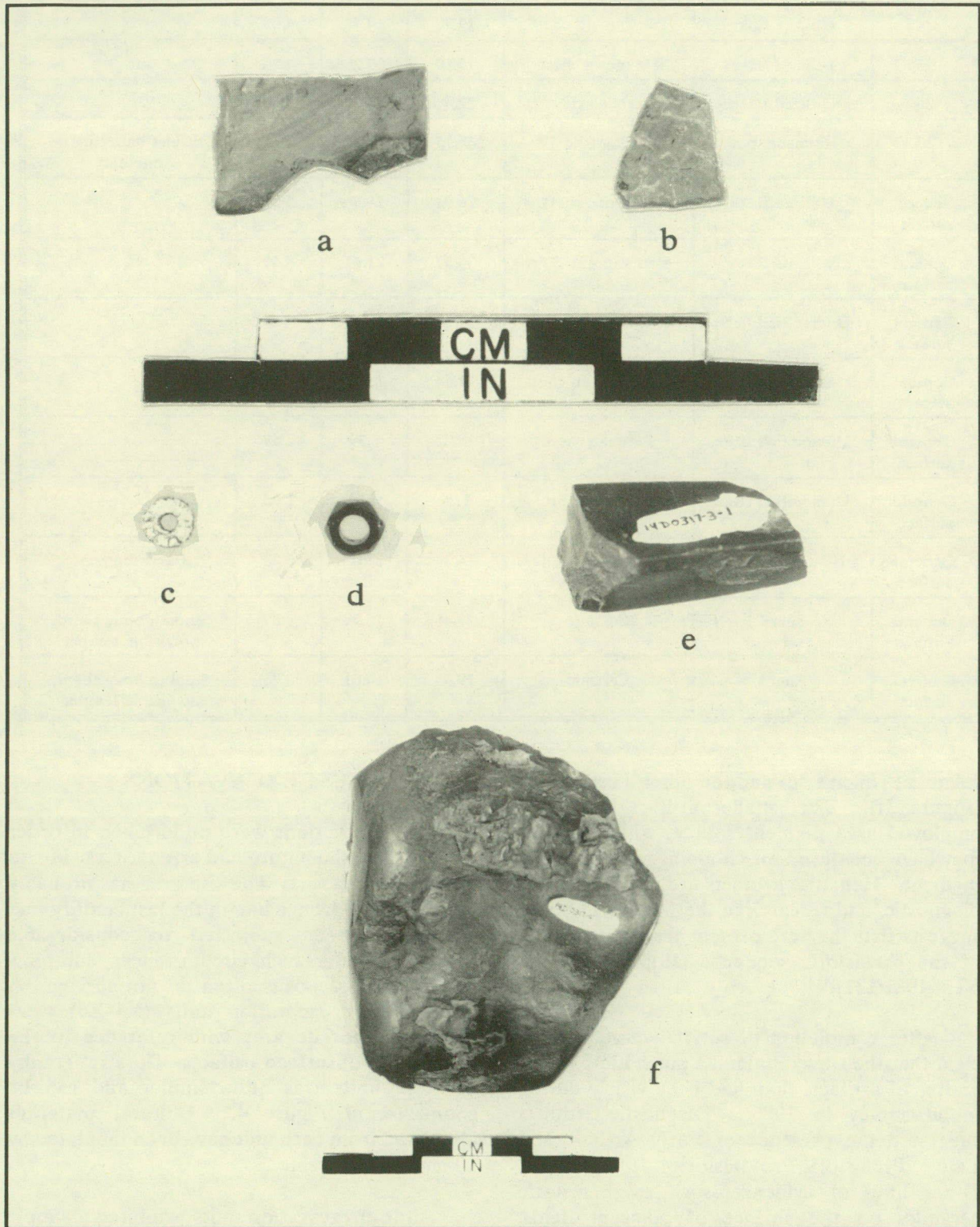


Figure 3. Selected artifacts from 14DO317. a) base of Dalton dart point, b) Late Prehistoric arrowpoint, c) drilled crinoid bead, d) faceted glass bead, e) faceted hematite artifact, f) ground hematite celt.

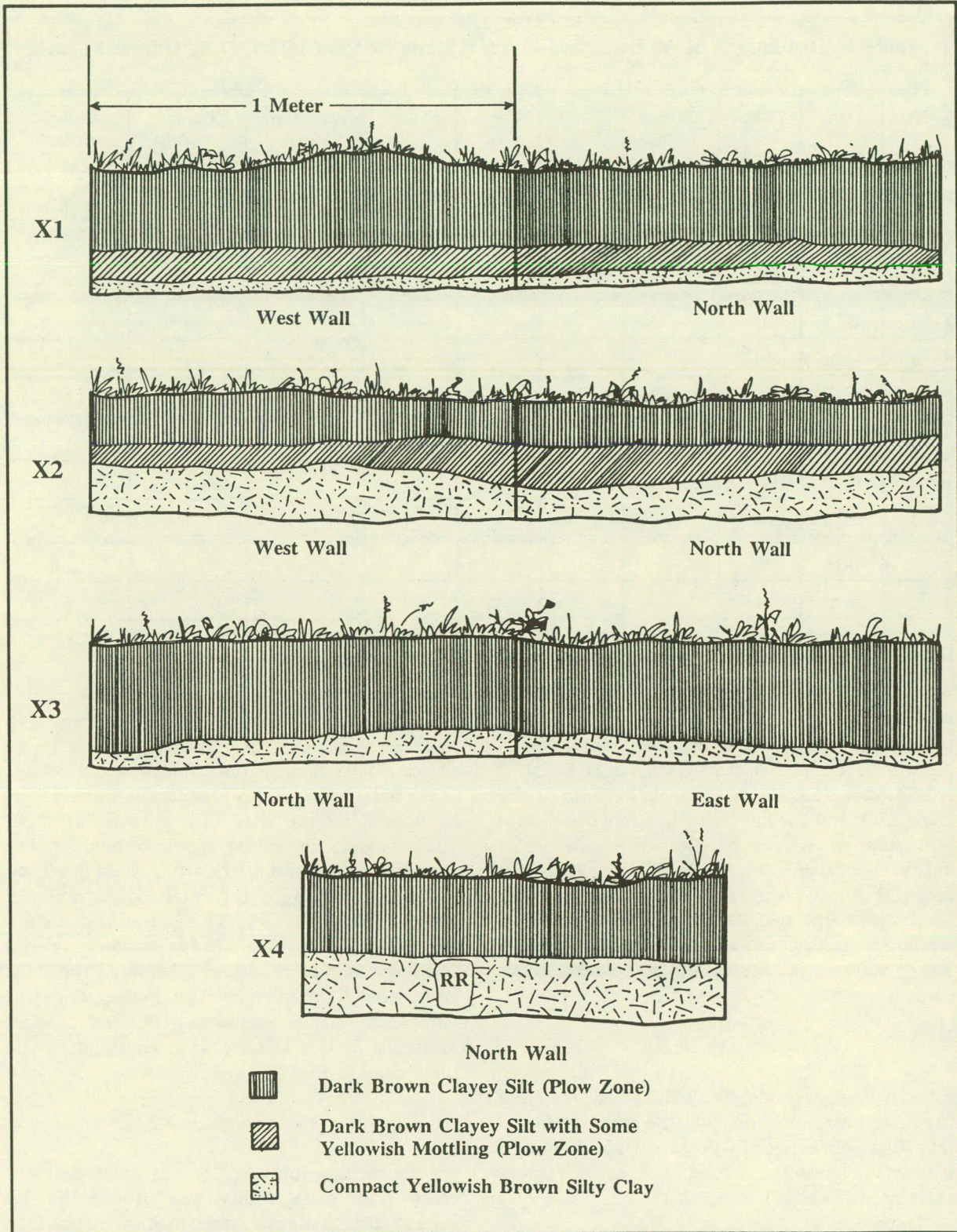


Figure 4. Excavation unit profiles from 14DO317.

Table 2. Distribution of All Excavated Cultural Materials from 14DO317 by Unit and Level.

XU	Level	Flakes	Utilized Flakes	Tools	Cores	Shatter	Prehistoric Sherds	Burned Earth/Sandstone	Historic Artifacts
1	0-10	8				2	1	3	6
1	10-20	19		1		7		8	11
1	20-30	24				3		1	2
2	0-10	12				4		2	
2	10-20	21		1		2		2	
2	20-30								
3	0-10	21	1			3		1	2
3	10-20	24	1					1	8
3	20-30	14				1		1	4
4	0-10	26				3			
4	10-20	7			1				1
4	20-30	19							

wet, dark brown clayey silt, while the underlying subsoil was characterized by compact, yellowish brown clayey silt. Excavations Units 1 and 2 exhibited a transitional zone at the base of the plow zone, but the basic stratigraphic situation is still that of a plowed site with not intact subsurface deposits (Figure 4). All four excavation units were excavated in three 10-cm levels. The first two were within the plow zone, while the third straddled the boundary with the sterile subsoil. All fill was dry screened through ¼-inch mesh.

Excavation Unit 1

The first excavation unit (X1) was located in the northern portion of the site area to investigate an especially dense surface scatter of artifacts (Figure 2). A total of 96 artifacts were recovered (Table 2).

Level 1 in X1 contained 20 artifacts, including a temporally diagnostic prehistoric sherd. Unfortunately, it is quite small and so

eroded as to be virtually unidentifiable. No surface treatment or temper type can be discerned, so its only contribution is to reinforce the presence of a general ceramic-age occupation at the site. The historic artifacts, clinkers, glass, and metal, appear to be related to farming operations. Level 2 contained 46 artifacts, including one formal tool, a unifacial scraper (Table 2). The 11 historic artifacts are all clinkers, likely related to early steam-powered farming equipment. Level 3 spanned the plow zone/subsoil boundary. The lower zone was completely sterile, suggesting that all cultural materials in this locality were confined to the plow zone.

Excavation Unit 2

Excavation unit 2 (X2) was located at the crest of the ridge, which runs through the site area, within a dense concentration of surface artifacts (Figure 2). The unit produced a total of 44 artifacts (Table 2).

In level 1, a total of 18 artifacts were recovered, including 12 flakes, 4 pieces of shatter, and 2 fragments of burned earth/sandstone (Table 2). None of these artifacts is temporally diagnostic. No historic artifacts were recovered. Level 2 contained 26 artifacts, including the drilled crinoid fossil bead described above (Figure 3c). Other artifacts include 21 flakes, 2 pieces of shatter, and 2 pieces of burned earth/sandstone (Table 2). Level 3 did not produce any cultural materials.

Excavation Unit 3

Excavation unit 3 (X3) was located along the proposed trafficway centerline in an area of high surface artifact density (Figure 2). It yielded 82 artifacts (Table 2).

In level 1, a total of 28 artifacts were recovered, including 21 flakes, 1 utilized flake, 3 pieces of shatter, 1 fragment of burned earth/sandstone, 1 clinker, and 1 historic ceramic sherd (Table 2). Only one of these artifacts is temporally diagnostic. The historic ceramic fragment is a whiteware sherd with flow blue decoration. Although such ceramics span a lengthy time period, they were most common in the late nineteenth century. The historic artifacts likely accumulated as the result of long-term farming activities. Level 2 contained 34 artifacts were recovered, including 24 flakes, 1 utilized flake, 1 piece of burned earth/sandstone, and 8 historic artifacts (Table 2). Three of the historic artifacts are clinkers, one is a metal fragment, and 4 are small whiteware sherds. All of these artifacts can be assigned to the late nineteenth century and are probably the result of farming operations. In level 3, a total of 20 artifacts were recovered. Of those, 14 are flakes, 1 is a piece of shatter, 1 is a piece of burned earth/sandstone, and 4 are historic artifacts (Table 2). The historic objects are three metal fragments and one clinker, all are likely present as the result of farming activities.

Excavation Unit 4

Excavation unit 4 (X4) was located in the southern portion of the site in an area of moderate surface artifact density (Figure 2). The unit was placed to examine the area south

of the proposed trafficway centerline, even though the artifact density was lower than that of areas to the north. X4 produced 57 artifacts (Table 2).

In level 1, a total of 29 artifacts were recovered, including 26 flakes and 3 pieces of shatter (Table 2). None of these artifacts is temporally diagnostic. Level 2 yielded nine artifacts, including seven flakes, one core, and one historic artifact (Table 2). The historic artifact is a clinker, probably deposited during early farming operations. Level 3 contained 19 flakes, none of which is temporally diagnostic (Table 2).

SUMMARY AND CONCLUSIONS

Intensive survey across the area of 14DO317 revealed the presence of over 200 artifacts, predominantly unmodified flakes. Diagnostic surface artifacts included two projectile points and one glass trade bead. Together they suggest two occupations: Early Archaic Dalton and Late Prehistoric/Protohistoric. Other non-diagnostic artifacts found on the surface included bifacial and unifacial tools, cores, and two ground hematite objects. All 27 tools were point-provenienced, using transit and stadia rod.

Four 1 x 1-m excavation units were placed in the site area with reference to areas of high surface artifact density. Excavation revealed that in all cases, the cultural materials are confined to the plow zone. No indication of artifacts or features could be detected in the underlying subsoil. Given that all of the site's occupation, comprising some 9,000 years, is confined to the plow zone, further excavations would be unlikely to yield additional significant information.

Despite the lack of intact subsurface cultural deposits, this site has produced valuable information regarding Kansas prehistory and history. Excavation results from the site have revealed the presence of an Early Archaic occupation in the Wakarusa valley, along with evidence for protohistoric trade between native peoples and Euro-Americans. It also provides an example of the type of information that can be recovered from "plow zone" sites investigated during the course of salvage excavations.

Acknowledgments. During the course of excavations at 14DO317, a number of individuals provided considerable assistance. The landowner graciously provided access to his property, and South Lawrence Trafficway Project Engineer John Pasley was most helpful. I am particularly grateful to three Kansas Anthropological Association volunteers (Harry Bradford, John Peterson, and Merle Jackson), who labored along with the paid crew members under very adverse conditions. Without their assistance, the excavations could not have been completed.

REFERENCES CITED

- Abel, Anna Heloise
1904 Indian Reservations in Kansas and the Extinguishment of their Title. *Transactions of the Kansas State Historical Society* 8:72-109.
- Andreas, A. T.
1883 *History of the State of Kansas*. 2 vols. A. T. Andreas, Chicago.
- Banks, Larry D.
1990 *From Mountain Peaks to Alligator Stomachs: A Review of Lithic Sources in the Trans-Mississippi South, the Southern Plains, and Adjacent Southwest*. Memoir No. 4. Oklahoma Anthropological Society, Norman.
- Beers, F. W. and Co.
1873 *Atlas of Douglas County, Kansas*. F. W. Beers and Co., New York.
- Bell, Robert E.
1960 *Guide to the Identification of Certain American Indian Projectile Points*. Special Bulletin No. 1. Oklahoma Anthropological Society, Norman.
- Blakeslee, Donald J., and Arthur H. Rohn
1986 *Man and Environment in Northeastern Kansas: The Hillsdale Lake Project*. Department of Anthropology, Wichita State University. Submitted to U.S. Army Corps of Engineers, Kansas City District.
- Brown, Kenneth L.
1985 *Pomona: A Plains Village Variant in Eastern Kansas and Western Missouri*. Unpublished Ph.D. dissertation, Department of Anthropology, University of Kansas, Lawrence.
- Chambers, M. E., and S. K. Tompkins
1977 *The Cultural Resources of Clinton Lake, Kansas: An Inventory of Archeology, History, and Architecture*. Iroquois Research Institute. Submitted to the U.S. Army Corps of Engineers, Kansas City District.
- Champe, John L.
1946 *Ash Hollow Cave*. New Series No. 1. University of Nebraska Studies, Lincoln.
- Chapman, Carl H.
1948 A Preliminary Survey of Missouri Archaeology, Part IV. *Missouri Archaeologist* 10(4):135-164.
- Chism, James V.
1966 *Appraisal of the Archeological Resources of the Clinton Reservoir, Douglas, Osage and Shawnee Counties, Kansas*. Museum of Natural History, University of Kansas, Lawrence. Prepared for the Inter-Agency Archeological and Paleontological Salvage Program.
- Clifton, James A.
1977 *The Prairie People: Continuity and Change in Potawatomi Indian Culture, 1665-1965*. Regents Press of Kansas, Lawrence.
- Dickey, Harold P., Jerome L. Zimmerman, Robert O. Plinsky, and Richard D. Davis
1977 *Soil Survey of Douglas County, Kansas*. U.S. Department of Agriculture, Soil Conservation Service, in cooperation with Kansas Agricultural Experiment Station, Manhattan.
- Dubin, Lois Sherr
1987 *The History of Beads*. Harry N. Abrams Inc., New York.

- Fladmark, Knut R.
1986 Getting One's Berings. *Natural History* 95(11):8-19.
- Goodyear, Albert C.
1974 *The Brand Site: A Techno-Functional Study of a Dalton Site in Northeast Arkansas*. Research Series No. 7. Arkansas Archeological Survey, Fayetteville.
- 1982 The Chronological Position of the Dalton Horizon in the Southeastern United States. *American Antiquity* 47(2):382-395.
- Grayson, Donald K.
1987 Death by natural causes. *Natural History* 96(5):8-13.
- Hammond, G. P., and A. Rey
1940 *Narratives of the Coronado Expedition*. Coronado Historical Series No. 2. University of New Mexico Press, Albuquerque.
- Hoffhaus, Charles E.
1964 Fort de Cavagnial: Imperial France in Kansas, 1744-1764. *Kansas Historical Quarterly* 30(4):425-454.
- Johnson, Alfred E.
1968 *Archaeological Investigations in the Clinton Reservoir Area, Eastern Kansas*. Museum of Anthropology, University of Kansas, Lawrence. Submitted to National Park Service, Midwest Region, Omaha, Nebraska.
- 1974 Settlement Pattern Variability in Brush Creek Valley, Platte County, Missouri. *Plains Anthropologist* 19(64):107-122.
- 1976 A Model of the Kansas City Hopewell Subsistence-Settlement System. In *Hopewellian Archaeology in the lower Missouri Valley*, edited by Alfred E. Johnson, pp. 1-6. Publications in Anthropology No. 8. University of Kansas, Lawrence.
- 1979 Kansas City Hopewell. In *Hopewell Archaeology: The Chillicothe Conference*, edited by D. S. Brose and N'omi Greber, pp. 86-93. Kent University Press, Kent, Ohio.
- 1981 The Kansas City Hopewell Subsistence and Settlement System. *The Missouri Archaeologist* 42:69-76.
- 1991 Kansa Origins: An Alternative. *Plains Anthropologist* 36(133):57-65.
- Jones, Bruce A., and Thomas A. Witty, Jr.
1980 The Gilligan Site, 14CF332. In *Salvage Archeology of the John Redmond Lake, Kansas*, edited by Thomas A. Witty, Jr. pp. 67-125. Anthropological Series No. 8. Archeology Department, Kansas State Historical Society, Topeka.
- Justice, Noel D.
1987 *Stone Age Spear and Arrow Points of the Midcontinental and Eastern United States*. Indiana University Press, Bloomington and Indianapolis.
- Katz, Paul R.
1971 Archeology of the Sutter Site in Northeastern Kansas. *Plains Anthropologist* 16(51):1-19.
- 1973 Radiocarbon Dates from the Sutter Site, Northeastern Kansas. *Plains Anthropologist* 18(60):167-168.
- Katz, Susanna R.
1974 *Kansas City Hopewell Activities at the Deister Site*. Research Series No. 1. Museum of Anthropology, University of Kansas, Lawrence.
- Kelley, J. Charles
1947 The Lehman Rock Shelter: A Stratified Site of the Toyah, Uvalde, and Round Rock Foci. *Bulletin of the Texas Archaeological and Paleontological Society* 18:115-128.
- King, James E.
1980 Post-Pleistocene Vegetational Changes in the Midwestern United States. In

- Archaic Prehistory on the Prairie-Plains Border*, edited by Alfred E. Johnson, pp. 3-11. Publications in Anthropology No. 12. University of Kansas, Lawrence.
- Kuchler, A. W.
1964 *Potential Natural Vegetation of the Coterminous United States*. Special Publication No. 36. American Geographical Society.
- LeeDecker, Charles H. (and others)
1980 *Archeological Investigations in the Clinton Reservoir area, Eastern Kansas*. Iroquois Research Institute. Submitted to the U.S. Army Corps of Engineers, Kansas City District.
- Lees, William B.
1986 *Results of a Phase II Cultural Resources Study of the Preliminary Location Study Corridor, Lawrence South Trafficway, Douglas County, Kansas*. Archeology Department, Kansas State Historical Commission, Topeka. Submitted to the Douglas County Commission, Douglas County, Kansas.
- Logan, Brad (editor)
1987 *Archaeological Investigations in the Clinton Lake Project Area, Northeastern Kansas: National Register Evaluation of 27 Prehistoric Sites*. Kaw Valley Engineering and Development, Inc., Junction City, Kansas. Submitted to the U.S. Army Corps of Engineers, Kansas City District.
- Mandel, Rolfe D., John D. Reynolds, Barry G. Williams, and Virginia A. Wulfkuhle
1991 *Upper Delaware River and Tributaries Watershed: Results of Geomorphological and Archeological Studies in Atchison, Brown, and Nemaha Counties, Kansas*. Contract Archeology Publication No. 9. Archeology Department, Kansas State Historical Society, Topeka.
- Marshall, James O.
1969 *The Glen Elder Focus*. Unpublished M.A. thesis, Department of Anthropology, University of Nebraska, Lincoln.
- Morse, Dan F.
1971 The Hawkins Cache: A Significant Dalton Find in Northeast Arkansas. *The Arkansas Archaeologist* 12(1):9-20.
- Murphy, Joseph F.
1961 *Potawatomi Indians of the West: Origins of the Citizen Band*. Unpublished Ph.D. dissertation, University of Oklahoma, Norman.
- Neuman, Robert W.
1963 Archeological Salvage Investigations in the Lovewell Reservoir Area, Kansas. In *River Basin Surveys Papers* 32:257-306. Bulletin No. 185. Smithsonian Institution, Bureau of American Ethnology, Washington, D.C.
- O'Brien, Patricia J.
1979 The Ashland Bottoms Site (14RY603): A Kansas City Hopewell Site. *Plains Anthropologist* 24(83):1-20.
- 1984 *Archeology in Kansas*. Public Education Series No. 9. Museum of Natural History, University of Kansas, Lawrence.
- Reichert, Milton
1972 A Plainview Type Point from the Delaware. *Kansas Anthropological Association Newsletter* 18(3):7-9.
- 1973 Gravel Bar Salvage Archeology, A Study Made in the Delaware River, Northeast Kansas. *Kansas Anthropological Association Newsletter* 19(1, 2):1-17.
- 1979 Bourgmont's Route to Central Kansas: A Reexamination. *Kansas History* 2(2):96-120.
- 1981 An In Situ Paleo Point from Northeast Kansas. *Journal of the Kansas Anthropological Association* 2(5, 6):121-123.
- 1984 A Munkers Creek Knife from the Vicinity of Half Mound on the

- Delaware River of Northeast Kansas: A Preliminary Report. *Journal of the Kansas Anthropological Association* 5(1):3-7.
- 1985 Another Meserve Point from the Delaware River. *Journal of the Kansas Anthropological Association* 6(3):39-40.
- Reid, Kenneth C.
1983 The Nebo Hill Phase: Late Archaic Prehistory in the Lower Missouri Valley. In *Archaic Hunters and Gatherers in the American Midwest*, edited by James L. Phillips and James A. Brown, pp. 11-39. Academic Press, Inc., New York.
- Reynolds, John D.
1979 *The Grasshopper Falls Phase of the Plains Woodland*. Anthropological Series No. 7. Archeology Department, Kansas State Historical Society, Topeka.
- 1981 The Grasshopper Falls Phase: A Newly Defined Plains Woodland Cultural-Historical Integration Phase in the Central Plains. *The Missouri Archeologist* 42:85-95.
- 1983 *Archeological Investigations at Old Fort Scott, 14BO302, Fort Scott, Kansas, 1968 to 1972*. Archeology Department, Kansas State Historical Society. Submitted to National Park Service, Midwest Region, Omaha, Nebraska.
- 1984 *The Cow Killer Site, Melvern Lake, Kansas*. Anthropological Series No. 12. Archeology Department, Kansas State Historical Society, Topeka.
- 1987 *The Archeology of Grove Reservoir, Kansas, 1969*. Anthropological Series No. 14. Archeology Department, Kansas State Historical Society, Topeka.
- Roberts, Frank H. H., Jr.
1940 Developments in the Problem of the North American Paleo-Indian. *Smithsonian Miscellaneous Collections* 100:51-116. Washington, D.C.
- Roper, Donna C., and Margaret A. Van Ness
1981 Hematite. In *Prehistoric Cultural Continuity in the Missouri Ozarks: The Truman Reservoir Mitigation Project*, Vol. 2, edited by Donna C. Roper, pp. 109-133. American Archaeology Division, Department of Anthropology, University of Missouri, Columbia. Submitted to the U.S. Army Corps of Engineers, Kansas City District.
- Rusco, Mary Kiehl
1960 *The White Rock Aspect*. Note Book No. 4. Laboratory of Anthropology, University of Nebraska, Lincoln.
- Shippee, J. Mett
1948 Nebo Hill, A Lithic Complex in Western Missouri. *American Antiquity* 14(1):29-32.
- Schmits, Larry J.
1976 *The Coffey Site: Environment and Cultural Adaptation at a Prairie Plains Archaic Site*. Submitted to National Park Service, Interagency Archeological Services, Denver.
- 1978 *The Coffey Site: Environment and Cultural Adaptation at a Prairie Plains Archaic Site*. Special Paper No. 1. *Midwestern Journal of Archaeology* 3(1):69-185.
- 1981 *Archaeological and Geological Investigations at the Coffey Site, Tuttle Creek Lake, Kansas*. Submitted to National Park Service, Interagency Archeological Services, Denver.
- Schoewe, W. E.
1949 The Geography of Kansas, Part II, Physical Geography. *Transactions of the Kansas Academy of Science* 52(3): 261-333.
- Stull, Donald D.
1984 *Kiikaapoa: The Kansas Kickapoo*. Kickapoo Tribal Press, Horton, Kansas.

- Suhm, Dee Ann, Alex D. Krieger, and Edward B. Jelks
 1954 *Handbook of Texas Archeology: Type descriptions*. Bulletin No. 4. Texas Memorial Museum, University of Texas, Austin. Special Publications No. 1. Texas Archeological Society.
- Thies, Randall M.
 1980 Archeological Investigations at John Redmond Reservoir, East Central Kansas, 1979. Ms. on file, Archeology Department, Kansas State Historical Society, Topeka.
- 1990 *The Archeology of the Stigenwalt Site, 14LT351*. Contract Archeology Publication No. 7. Archeology Department, Kansas State Historical Society, Topeka.
- Unrau, William E.
 1971 *The Kansa Indians: A History of the Wind People, 1673-1873*. University of Oklahoma Press, Norman.
- Wedel, Mildred Mott
 1981 *The Deer Creek Site, Oklahoma: A Wichita Village Sometimes Called Ferdinandina, An Ethnohistorian's View*. Series in Anthropology No. 5. Oklahoma Historical Society, Norman.
- Wedel, Waldo R.
 1946 The Kansa Indians. *Transactions of the Kansas Academy of Science* 49(1):1-35.
- 1959 *An Introduction to Kansas Archeology*. Bulletin No. 174. Smithsonian Institution, Bureau of American Ethnology, Washington, D.C.
- Wilmeth, Roscoe
 1970 *Excavations in the Pomona Reservoir*. Anthropological Series No. 5. Archeology Department, Kansas State Historical Society, Topeka.
- Witty, Thomas A., Jr.
 1967 The Pomona focus. *Kansas Anthropological Association Newsletter* 12(9):1-5.
- 1978 Along the Southern Edge: The Central Plains Tradition in Kansas. In *The Central Plains Tradition: Internal Developments and External Relationships*, edited by Donald J. Blakeslee, pp. 56-66. Report No. 11. Office of the State Archeologist, University of Iowa, Iowa City.
- 1981 The Pomona Focus, Known and Unknown. *The Missouri Archaeologist* 42:77-84.
- 1982 *The Slough Creek, Two Dog and William Young Sites, Council Grove Lake, Kansas*. Anthropological Series No. 10. Archeology Department, Kansas State Historical Society, Topeka.
- 1983 *Four Archeological Sites of the Perry Lake, Kansas*. Anthropological Series No. 11. Archeology Department, Kansas State Historical Society, Topeka.
- Witty, Thomas A., Jr. (editor)
 1980 *Salvage Archeology of the John Redmond Lake, Kansas*. Anthropological Series No. 8. Archeology Department, Kansas State Historical Society, Topeka.

BOOK REVIEW

Principals of Geoarchaeology: A North American Perspective. MICHAEL R. WATERS. The University of Arizona Press, Tucson, 1992. xxiv + 398 pp., 139 figures, 7 tables, 3 appendices, references, index. \$40.00 (cloth). ISBN 0-8165-0989-1.

Reviewed by Jim D. Feagins, Saint Joseph Museum

It is obvious that the earth's surface provides diverse and ever-changing platforms on which people reside and make their living. Therefore, it is mandatory that archeologists have a solid understanding of the natural processes that change the earth's surface, how these processes influenced the people who once lived on and utilized various geomorphic settings, and how the cultural traces they left behind (i.e., archeological sites) are modified and even destroyed by these continuing geoprocesses. These factors have a profound effect on the archeological data and how it is eventually interpreted. "Geoarchaeology is the field of study that applies the concepts and methods of the geosciences to archaeological research" (p. xix). Since most archeological research is conducted on the surface and just below the surface of the earth, many basic archeological problems are initially problems of geoarchaeology. It is a critical field of study with which archeologists should be thoroughly familiar.

Principles of Geoarchaeology is a "user friendly" textbook. Most practicing archeologists should find significant benefit from this publication. Its organization and the explanations given are generally quite clear and easy to comprehend, even for those with no geoscience background. The author, Michael Waters, emphasizes the field aspects of geoarchaeology--landscape reconstruction, stratigraphy, and the processes of site formation and modification. The temporal and geographical focus of the publication, the methods and concepts discussed, and examples given are specifically tailored for the North American archeologist.

The author is careful to point out that the volume is not a cookbook approach. The geological variability and complexity of each site and region will require considerable experience to interpret with assurance and depth. One will not become an expert on geoarchaeology by simply reading this one volume. The book is intended to provide basic understanding of geoarchaeology and to enhance the cooperative effort between the geosciences and archeology in order to answer a variety of archeological questions. Geoarchaeology can help relate archeological sites and their contents to the contextual components of their environment. Waters states that,

. . . geoarchaeology uses techniques and approaches from geomorphology (the study of landform origin and morphology), sedimentology (the study of the characteristics and formation of deposits), pedology (the study of soil formation and morphology), stratigraphy (the study of the sequence and correlation of sediments and soils), and geochronology (the study of time in a stratigraphic sequence) to investigate and interpret the sediments, soils, and landforms at archaeological sites (pp. 3-4).

The temporal context of sites and their contents, a better understanding of the natural processes of site formation (including spatial context and preservation), and the context of prehistoric landscapes (before, during, and after site occupation) are all general research objectives addressed by geoarchaeologists.

The largest chapter (100 pages) is titled, "Geoarchaeological Foundations." This chapter provides basic information on which the rest of the volume is constructed. The morphology, taxonomy, and origins of soils and sediments, as well as the fundamentals of stratigraphy, are well described. Archeologists will especially value the sections on application of these topics to archeological research--i.e., landscapes reconstruction, preservation of sites, formation of the archeological record, and interpreting the context of preserved sites.

Waters does an excellent job of describing alluvial environment, so important for archeologists to understand and interpret. He covers streamflow, erosion, and deposition of sediments, various types of alluvial environments (rivers, arroyos, terraces, and fans), alluvial landscape evolution and how it affects landscape reconstruction, and the interpretation of the archeological record. Since a high percentage of archeological sites are located in alluvial settings (landscapes formed and continuously modified by running water), it is essential that archeologists have a well-grounded understanding of alluvial processes and morphology.

Eolian environments were also discussed in detail. Special emphasis was placed on sand dunes, loess, dust, stone pavements, volcanic ash, and, of course, wind erosion, transport, and deposition processes.

The chapter on "Coastal Environments," while detailed and well done, is not as relevant to practicing archeologists in the midwest. This chapter covers coastal processes, Late Quaternary sea level changes, types of coastal environments, coastal landscape evolution and the archeological record, and coastal landscape reconstruction.

A potpourri of special topics are grouped together in another chapter. These include the formation processes and morphology of springs, lakes, slopes, glaciers, rockshelters, and caves. These topics were carefully related to the archeological records found in or near each of the settings described. As with the others, this chapter is well written; however, it is surprising that no mention was made of prehistoric cave mining (as in Salt Cave, Kentucky) or the not uncommon occurrence of petroglyphs in rockshelters and around cave entrances.

Chapter 7 is devoted to postburial disturbances of archeological site contexts. This chapter describes floralturbation, faunal-turbation, cryoturbation, argilliturbation, graviturbation, deformation, and disturbance processes. (A lengthy and more detailed coverage of this topic can be found in Schiffer's [1987] *Formation Processes of the Archeological*

Record.) Waters has produced a fine summary of the processes affecting specific archeological sites. Several examples from the Central Plains are given.

Geoarchaeology, the child born long ago from geoscience and archeology, is clearly maturing. This subdiscipline has become better organized and will continue to make ever increasingly significant contributions to archeology. It is indispensable in many situations. To summarize, Waters states that "Geoarchaeology contributes substantially to . . . goals of archaeological research by defining (1) the relative and absolute temporal framework of sites; (2) the way geological processes have affected the archaeological record from which human behavior is reconstructed; and (3) the way the landscape may have influenced the operation of cultural systems" (pp. 319-320).

In order to keep the volume's size and expense manageable, there are a few geoarchaeology topics not included in *Principals of Geoarchaeology*. Waters does point out other good sources for those topics--dating techniques, geophysics, and geochemistry. The topics included in this volume are generally well covered. This publication is a "tour de force" of most of the subject. Waters, an associate professor of anthropology and geography at Texas A&M University, cites more than 740 references.

The volume's many line drawings greatly clarify the concepts described in the text. It contains much practical information that can be put directly to use in archeological research. A glossary would have been useful for readers with a limited earth science background.

This volume should be of value not only to professional archeologists, but to avocational archeologists, who desire to improve their understanding of the subject, and to geologists interested in related problems or in working with archeologists. *Principals of Geoarchaeology* may be obtained through your local bookstore or directly from the University of Arizona Press, 1230 North Park Avenue, #102, Tucson, Arizona 85719. This publication is an important reference.

ABOUT THE AUTHORS

Jim D. Feagins

Saint Joseph Museum, St. Joseph, Missouri 64501-2874

Jim is a life member and former officer of the KAA whose research interests focus on the Kansas City area. He holds an M.A. in anthropology and is affiliated with the Saint Joseph Museum. Jim's book reviews are common features in KAA publications, and site records bearing his name abound in Kansas and Missouri.

John G. Hedden

Office of the State Archaeologist, University of Iowa, Iowa City, Iowa 52242

John is a Project Archaeologist with the University of Iowa Office of the State Archaeologist, Highway Archaeology Program. He received his M.A. in Anthropology from the University of Kansas in 1992. His research interests include late prehistoric periods of the Central Plains and historic archeology along the Kansas and Missouri border.

Brad Logan

Museum of Anthropology, University of Kansas, Lawrence, KS 66045

Brad is a native of Clay Center, Kansas. He received his M.A. from the University of Nevada, Reno in 1977 and his Ph.D. from the University of Kansas in 1985. He is director of the Office of Archaeological Research and Associate Curator of the Museum of Anthropology and Adjunct Assistant Professor in the Department of Anthropology at the University of Kansas. He is a member of the KAA.

Milton Reichart

605 Linn Street, Valley Falls, KS 66088

Milton is a long-standing member of the KAA and a fixture at the summer field school. He is known among professionals in the state as a fundamental source on the prehistory of northeast Kansas and has published several articles on this topic through the years. In addition to his volunteer work in archeology, he has been a valued crew member on numerous salvage and research projects conducted by the University of Kansas and the Kansas State Historical Society.

Robert L. Thompson

817 College Street, Atchison, KS 66002

Bob is a member of KAA and a charter member the Kanza Chapter. He has been a member of the Missouri Archaeology Society for four years. He has located and registered six sites in Atchison County, one in Leavenworth County, and one in Riley County. Recently he worked for the Department of Anthropology, University of South Dakota on a survey team at Milford Lake. Should anyone have any information related to the Kanza village or be interested in helping to find it, please write to Bob at the address above or call 913-367-0733.

Timothy Weston

Kansas State Historical Society, 120 West 10th Avenue, Topeka, KS 66612-1291

Tim is the Kansas State Historical Society's highway archeologist. He is originally from Denver, Colorado, and holds B.A. and M.A. degrees in Anthropology from the University of Colorado and a Ph.D. in Anthropology from the University of Kansas. His research interests include prehistoric settlement patterns, modified bone technology, and cultural change during the contact period. Tim is a member of the KAA.

CLARK, JULIA D
CLARK, RANDY A. AND JANICE
CLARKSTON, KENDELL C
COBB, MR AND MRS W.T.
CONRAD, MARY
CONRAD, MARY
COOK, EVA C
CORMODE, FRANCIS AND BARBARA
COWDERY, ROBERT AND SUE
CRAWFORD, GENE
CRIQUI, DR. ORVEL A
CROWLEY, ED AND VIRGINIA
CURRIE, RUTH
DAHLSTEN, PAUL AND NORMA
DALE, FRANK D
DANIEL, KATHERINE J
DARROW, MARK
DAVIDSON, DOROTHY AND KENNETH
DAVIS MEMORIAL LIBRARY
DAVIS, EILEEN
DECKERT, LEON AND ELLAMAE
DEINES, WILLIAM E.
DELKER, LOWELL
DENNEY, ELIZABETH A.
DETRICH, KARL
DETRICH, PHIL
DETRICH, VERNA
DICKINSON, GUY
DICKINSON, SCOTT
DICKSON, JULIE ALBRIGHT
DIDDE, DONNA
DOBBS, DR EDITH
DREWS, WILLIAM R.
DUXBURY, ERNIE & JOYCE
EITEL, HOWARD AND LELA
ELLIS LIBRARY
ELMORE, GEORGE AND KAY
EMERSON, ALLISON
EMERSON, CRYSTAL
ERICKSON, GEORGE
ERICKSON, STEVE
ERNST, WALTER AND LAVERNA
ESKEW, MAURICE
ESTEP, ROSE
FARRELL LIBRARY
FAUBION, JANE
FEAGINS, JIM D.
FERGUSON, PAUL M.
FITCH, WARREN H.
FITZGERALD, BETTY AND CARL
FLEENOR, JACOB C
FOGARTY, MARY K
FOGLER, FRANK AND ELLEN
FOLSOM, CHAINY J
FOUST, MARYLIE
FRANCIS, SCOTT
FRANK, ANITA
FREDRICKSON, NANCY AND DUANE
GARDENHIRE, PATTIE
GARVER, ANGIE
GATES, CATON
GEORGE, MIKE
GHERE, SHAROL
GHERE, TERRY JOHNSON
GHISELLI, WILLIAM B
GIBSON, TERRY
GLENN II, CHARLES
GLENN SR, CHARLES & DIXIE

[REDACTED]

GLEUE, PAUL
GLICKLEY, CHRISTINE LABRUZZO
GLYNN, JANET K.
GRAVES, ORIE AND LOIS
GRIFFIN, MARILYN
GUNN, KEVIN
HANSON, MARLENE
HARBERT, TERRY AND PAULA
HARE, JAMES H.
HARTMAN, MICHELE D
HARTMAN, RICHARD & MARGARET
HAWLEY, MARLIN
HAXTON, PATRICIA
HEASTY, DONALD AND CAMILLA
HEATH, MARVIN W
HEDGES, TERESA
HEGEWALD, NADINE
HEIMAN, ANNE
HEIMAN, PAUL AND ARVILLA
HENRY, MARILYN
HEPNER, RITA
HETT, JAMIE
HIGGINS, JOE
HIPPI, BARBARA
HOFFMAN, DALE W.
HOFMAN, JACK AND PAT
HOLEN, STEVE
RESEARCH ARCHEOLOGIST
HOLTBY, JIM AND KAY
HOOVER, CLARISSA
HOUSER, THOMAS HAIN
HOWE, LOIS M.
HOWELL, JEAN AND BILL
HUSS, JAMES A.
HUTCHCRAFT, TED
INGELS, MARK S
ISMERT, CHRISTIAN
JACKSON, GREG AND ALICE
JACKSON, MERLE L AND JEAN
JANESKI SR, ROBERT R
JANESKI, NICHOLAS A
JEWETT, WILLIAM R
JIRIK, DALE
JOCHIM, MARK J
JOHNSON, BOB
JOHNSON, DR. ALFRED
JOHNSON, ELMA M. AND MARK A.
JOHNSON, NEIL
JOHNSON, PAUL AND ROBIN
JONES, BRUCE
JONES, PAT
JUSTUS, EARNEST W.
KANSAS HERITAGE CENTER
KANSAS STATE HISTORICAL LIBRARY
KECK, DICK AND CYNTHIA
KEPLINGER, DOROTHY
KIMBALL, BOB & LINDA
KIMBALL, HARRY
KIMBALL, SCOTT
KIMBALL, STEVE
KINNERSLEY, MARGIE
KOLLER, DONALD G. and RITA L.
KRAISINGER, GARY & MARGARET
KRASE, HEATHER
KREISSLER, ALICE
KUHN, DONALD
LAMPE, LINDA
LARABEE, RHONDA

[REDACTED]

PARKER, ROB
PARKER, SHERRILYN
PARRISH, ARLYN
PATTERSON, JERRY
PATTON, NORA J
PEARL, DON
PEARL, JIM & EILEEN
PEARMAN, DOROTHY
PEARS, MARGENE
PEARSON, GAIL AND ROBIN
PEARSON, GENEVA AND DELMAR
PELLOR, CHAD C.
PETERSON, JOHN AND FRAN
PETERSON, MARLIN V.
PHIPPS, LINDA L
PORTER, BARBARA
PORTER, CALVIN AND LEANNE
POTENSKI, RON
POWERS, RAMON
PRIVAT, GARRY AND MARILYNN
PUBLIC LIBRARY
RAINBOLT, ROBERT L.
RAMSEY, PAM AND ANDY
RANEY, DUANE L
REED, EVELYN
REED, HAROLD AND MARGIE
REICHART, MILTON
REXROAD, VIRGINIA
REYNOLDS, JESSE
REYNOLDS, JOHN D
RHODES, THAD
RICHARDSON, KEITH
RISSMAN, LINDA
RITTER, HOMER L.
RITTERBUSH, LAUREN AND BRAD LOGAN
ROBB, GEORGE
ROBB, JIM AND TRISH
ROBB, NOEL N
ROBERTS, JAMES E. AND KAREN M.
ROBSON, BARBARA O
ROECKERS, HENRY J.
ROGERS, HARVEY
ROGERS, LAURA
ROMINE, JOHN AND PHYLLIS
ROPER, DONNA
ROTH, DWIGHT
ROTH, STANLEY
ROUBIDBAUX, BOB AND KARLN
ROWLISON, DON
ROYCE, CLARE H.
RUTTER, LARRY
SAFFELL, ROSA A
SAGE, SHARON
SALLEE, KENT
SCALET, DEBRA E
SCHILLING, VICKI
SCHMIDT, JOAN
SCHMIDT, SHASTA
SCHOEN, CHRISTOPHER AND ROXANNE
SCHRATER, JUDY
SCHULTE, REBECCA
SCHUYLER, ROBERT L
SCOTT, FRED
SCRIMSHER, FRANCES Z. AND BOB
SEARCH, JAMES J.
SEBORG, SALLY
SEIBEL, JERRY AND JANET
SEIFF, MICAH J

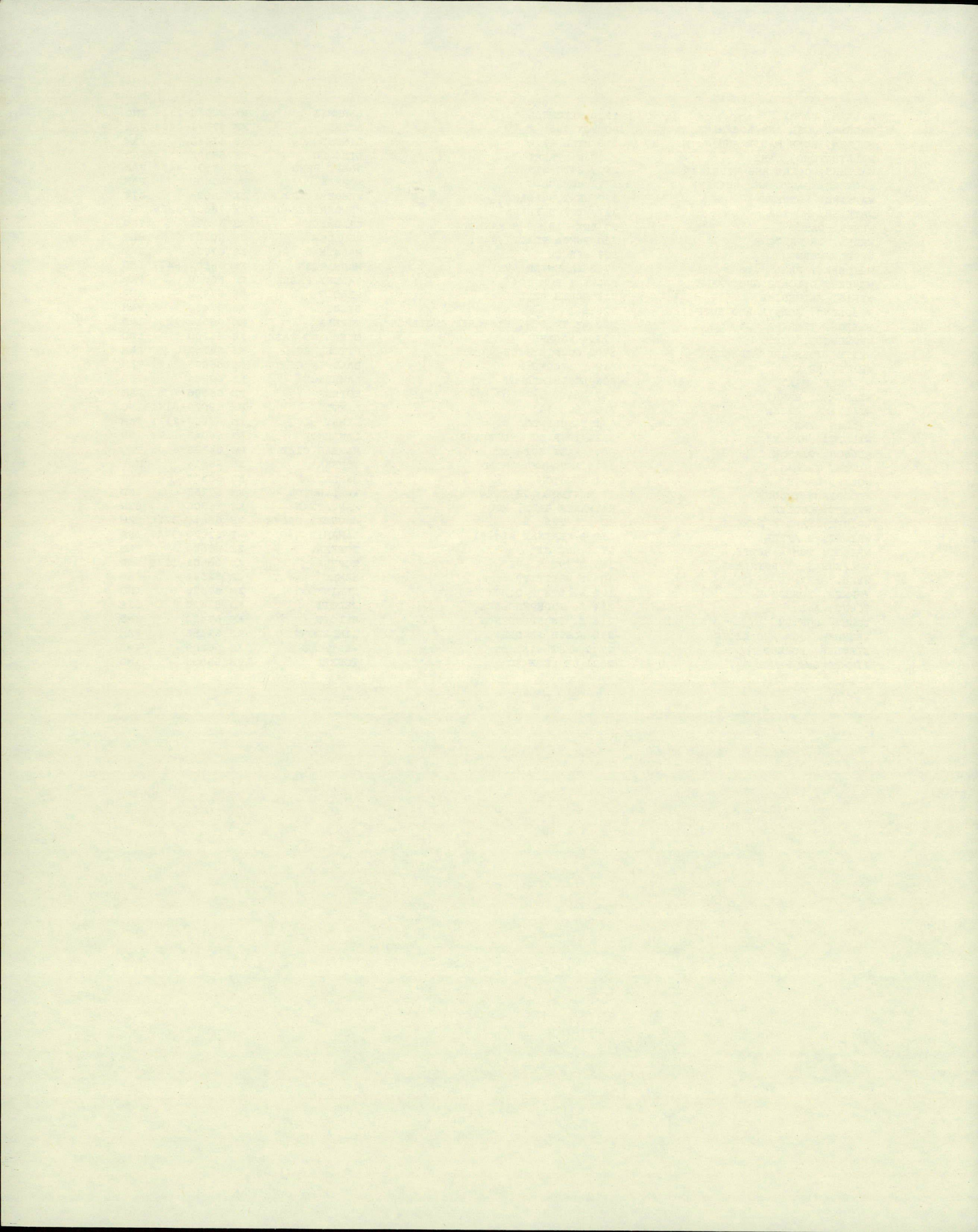
[REDACTED]

SELLEY, LINDA
SHAW, JUNE
SHAW, KENDALL
SHEETS, TERESA & ANNIE
SHERIDEN, SHIRLEY
SHERRADEN, KEN
SHERRADEN, SCOTT
SHIVELY, BARON
SHRINER, BERYL
SHRINER, DAWN RENEE'
SHRYOCK, ELISE AND MARTIN
SKAHAN, ROBERT
SLOCUM, DUSTI
SMITH JR., CHARLES O.
SMITH, ERIC
SMITH, JUDY AND AMANDA
SMITH, KENNETH AND CLORENE
SMITH, PAUL
SMITH, III, WALTER J.
SOLOMON, TERRY
SPERRY, CORWIN E
SPERRY, O.D. & CAROL
STAAB, CATHY
STAAB, NORINE C.
STAAB, RODNEY
STANLEY, ELLEN MAY
STARK, CHRIS
STATE ARCH. RESEARCH CENTER
STATE UNIVERSITY OF NEW YORK
STAUFFER, JIM F
STAUFFER, RICHARD
STECHEER, DAVID J
STEIN, CHARLES AND ALICE
STEIN, MARTIN
STEIN, PAT AND KELSEY
STITES, DEAN
STOLL, JUDITH A.
STOSS, MARVIN
STRICKLER, BRENDA
STRICKLIN, HENRY
STRICKLIN, WILLIS AND MARGIE
STUBBS, MICHAEL
SUDBURY, BRYON
SWENSON, JUDY
TABOR, JAN AND JAMIE
TAYLOR, DOUGLAS
TAYLOR, JEAN
TEMPLETON, MARTHA I.
TERRIAN, ANGIE
TERRY, KENNETH AND INA
TEVIS, KAREN AND DAN
THIES, RANDALL M.
THOMPSON, CAROLYN J.
THOMPSON, ROBERT L.
THURMOND, J PETER
TODD, ARTHUR AND HELEN
TOMPKINS, L D
TORRENCE, MARY
TRENT, ANN and Richard Martin
TUCKER, VITA J
UNIVERSITY OF KANSAS LIBRARIES
UNIVERSITY OF OKLAHOMA LIBRARY
UPHAM, WAYNE A
VEHIK, DR. SUSAN
VETERE, MARTIN AND EVELYN
VOLMUT, MARK & JACKIE MCLENNY
VRBAS, JEANETTE
WADE, ELIZABETH E

[REDACTED]

WALKER, DANNY
WALKER, JOEL AND ROSEMARY
WALLEN, ROSE MARIE AND J. M.
WALLINGFORD, CARE
WALTERS, CLEAT AND VIRGINIA
WALTERS, DARYL AND SHIRLEY
WATKINS, KENNETH
WATKINS, MONICA
WEBER, DAMON
WEDEL, DR WALDO R
WEDEL, VERNON
WEIDHAAS, PAUL
WERDER, DOLORES AND FRANK
WERTS, KATHERINE
WESSLING, JOANIE AND RUTH
WESTON, TIM
WETHERILL, BERT
WHITE, JOHN AND REBECCA
WHITE, KEITH
WILDGEN, MIKE
WILLIAMS, BARRY
WILLIAMS, CECIL
WILLIS, VAN & D
WILLITS, RAMONA J
WILSON, DIANNE C.
WITTY, THOMAS
WOLFF, DAVID
WOODRING, YVONNE
WRIGHT, COLLIN
WRIGHT, EARL & DEANNE
WRIGHT, HEATHER
WRIGHT, TOM & BETTY
WULFKUHLE, VIRGINIA A.
WYSS, MARILYN
YARMER, ROBERT E.
YOUNG, A.L.
YOUNG, DORTHY
ZEHNDER, JON AND BETTE
ZIEGLER, ROBERT
ZIMMERMAN, BRUCE

[REDACTED]



INFORMATION FOR AUTHORS

Manuscripts are actively solicited for *The Kansas Anthropologist*. Articles should have a relationship to Kansas anthropology (archeology, ethnography, ethnohistory, cultural/social anthropology, physical anthropology, etc.). All manuscripts must be the original, unpublished work of the authors. The varied readership of the journal should be kept in mind when preparing papers. **Jargon should be avoided.** The style authority is *American Antiquity* (see Volume 57, Number 4, 1992). Professionals are expected to submit their manuscripts in this form; others who are not familiar with the *American Antiquity* style guide will receive editorial assistance. Illustrations are encouraged; at least two or three should be included if possible. All illustrations must be of reproduction quality and should be designed to fit within 6 x 8.5-inch margins, including caption. If protected by copyright, this must be noted so permission for their use can be obtained. If IBM compatible computer technology is available, please submit papers on diskette in WordPerfect 5.1, as well as in single hard copy. Manuscripts will be reviewed by the editorial committee who will judge whether or not articles are appropriate and what revisions may be necessary for publication. Outside reviewers may be used.

Book reviews are also requested. If you plan to review a book but have not been requested to do so by the editor, it would be best to check with the editor to make sure that a review of that work has not already been arranged.

Submit manuscripts to the address below. The editorial staff is here to help you. If you have any questions, please contact:

Virginia A. Wulfkuhle, Editor
Kansas State Historical Society
120 West 10th Avenue
Topeka, Kansas 66612-1291
Telephone: 913-296-3813; FAX: 913-296-1005

